FINAL ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR):

PROPOSED CONSTRUCTION OF A SOLAR PHOTOVOLTAIC (PV) PLANT TO GENERATE UP TO 40 MW OF ENERGY (PHASE 2),

BRAKPAN, CITY OF EKURHULENI METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE

(REF: GP158MREA)

Final for submission to DMRE

October 2022

Prepared for:

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DOCUMENT TITLE: Final EIA Report for the Proposed Construction of a Solar Photovoltaic (PV) Plant to Generate up to 40 MW of Energy (Phase 2), Brakpan, City of Ekurhuleni Metropolitan Municipality, Gauteng Province (DMRE REF: GP 30/5/1/2/2 (158) MR)

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N.B. Text changes from DEIA to FEIA is indicated by means of strikethrough (i.e., text deleted) and underlined text (i.e., text amended or added) to reflect changes in the finalisation of this Environmental Impact Assessment Report for submission to the Competent Authority.

Invitation to comment on the Draft Environmental Impact Assessment Report

I&APs were invited to a 30-day commenting period from 12 September 2022 to 12 October 2021 (as the last day for commenting). The Draft EIA was available for Public Viewing and Commenting at the following localities:

- Electronic version available for download at http://www.emassistance.co.za/index.php/public-documents

- Hard copies:

    1. Brakpan Library
       Cnr Elliott and Escombe Avenue, Brakpan, 1541 (26°13'50.43"S 28°22'1.87"E); and
    2. Tsakane Customer Care Centre
       Nzima Street, Tsakane, Brakpan, 1548 (26°20'47.22"S 28°22'25.16"E)

    ~~Kindly direct any comments or queries regarding the documents in writing to EnviroRoots (Pty) Ltd at:~~
    Comments and queries were requested to be directed in writing to EnviroRoots (Pty) Ltd at:

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    NB Note: This process is a PUBLIC PROCESS. All comments and/or questions received from I&APs on this process is considered public knowledge. In accordance with the Environmental Impact Assessment Regulations, EnviroRoots (Pty) Ltd will not keep any information of this nature confidential and will submit all comments and/or questions received to the Regulatory Authority in a verbatim manner.

    This Public Participation Process is conducted in accordance with Section 11(1)(c) of the Protection of Personal Information Act, 2013 (Act No. 4 of 2013), which allows for the processing of personal information if processing complies with an obligation imposed by law on the responsible party and in accordance with Section 11(1)(f) of the Act which allows for the processing of personal information if processing is necessary for pursuing the legitimate interests of the responsible party or of a third party to whom the information is supplied.

- ~~A Public Meeting will take place during the public review period at the Woscom City Light Ark Church at Vulcania, Brakpan if requested.~~ No requests for a public meeting were received.

mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

ENVIRONMENTAL IMPACT ASSESSMENT REPORT And ENVIRONMENTAL MANAGEMENT PROGRAMME FOR:

PROPOSED CONSTRUCTION OF A SOLAR PHOTOVOLTAIC (PV) PLANT TO GENERATE UP TO 40 MW OF ENERGY (PHASE 2), BRAKPAN, CITY OF EKURHULENI METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE

(REF: GP158MREA)

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

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1. IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining "will not result in unacceptable pollution, ecological degradation or damage to the environment".

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

2. 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—-

(i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and

(ii) degree to which these impacts—

(aa) can be reversed;

(bb) may cause irreplaceable loss of resources, and

(cc) can be avoided, managed or mitigated;

(e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;

(f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;

(g) identify suitable measures to manage, avoid or mitigate identified impacts; and

(h) Identify residual risks that need to be managed and monitored.

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List of Abbreviations and Acronyms

ADU	Animal Demographic Unit
Absl	Above sea level
ARC	Agricultural Research Council
BA	Basic Assessment
BESS	Battery Energy Storage System
BID	Background Information Document
C&RR	Comments and Response Report
CA	Competent Authority
CARA	Conservation of Agricultural Resources Act 43 of 1983
CBAs	Critical Biodiversity Areas
Cllr	Ward Councilor
CSP	Concentrated solar power
DEAT	Department of Environmental Affairs and Tourism
DFFE	Department of Forestry, Fisheries and the Environment
DHSWS	Department of Human Settlements, Water and Sanitation
DMRE	Department of Mineral Resources and Energy
DRDLR	Department of Rural Development and Land Reform
DWS	Department of Water and Sanitation
ECCS	Energy and Climate Change Strategy
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EMPr	Environmental Management Programme
EO	Ecological / Environmental Officer
ESA	Early Stone Age
ESAs	Ecological Support Corridors
FAA	Federal Aviation Administration
GDARD	Gauteng Department of Agriculture and Rural Development
Ha	Hectare

HGM	Hydrogeomorphic
I&APs	Interested and affected parties
IBA	Important Bird Area
IFC	International Finance Corporation
IPP	Independent Power Producer
IRP	Integrated Resource Plan 2019
Km	Kilometre
KVA	Kilo Volt Amperes
M	meter
MPRDA	Mineral and Petroleum resources Development Act 28 of 2002
MSA	Middle Stone Age
MVA	Megavolt amperes
MWhs	Megawatt hours
NDP	National Development Plan 2030
NEMA	National Environmental Management Act 107 of 1998, as amended
NEMAQA	National Environmental Management: Air Quality Act 39 of 2004
NEMBA	National Environmental Management: Biodiversity Act 10 of 2002
NEMPA	National Environmental Management: Protected Areas Act 57 of 2003
NEMWA	National Environmental Management: Waste Act 59 of 2008
NFA	National Forest Act 84 of 1998
NHRA	National Heritage Resources Act 25 of 1999
NPAES	National Protected Areas Expansion Strategy
NWM	National Wetland Map
NWA	National Water Act 36 of 1998
O&M	Operation & Maintenance
PES	Present Ecological State
PV	Photovoltaic
QDGS	Quarter degree grid squares
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
SABAP2	South African Bird Atlas Project 2 Data

SCC	Species of conservation concern
SDG	Sustainable Development Goal
SEF	Solar Energy Facility
SIP	Strategic Infrastructure Projects
SP	Significance Points
SWSA	Strategic Water Source Areas
TOP	Threatened or protected
UPS	Uninterruptible Power Supply
VAC	Visual Absorption Capacity
WML	Waste management license
WULA	Water Use License Application

List of Definitions

Alternative:

A possible course of action, in place of another, that would meet the same purpose and need (of the proposal). Alternatives can refer to any of the following but are not limited to alternative sites for development, alternative projects for a particular site, alternative site layouts, alternative designs, alternative processes and alternative materials.

Best practicable environmental option:

The option that provides the most benefit and cause the least damage to the environment as a whole at a cost that is acceptable to society not only short term but also in the long term.

Cumulative Impacts:

Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combines to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.

Direct impacts:

Impacts that are caused directly by the activity and generally occur at the same time and at the same place of the activity (e.g. noise generated by blasting operations at the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.

'Do nothing' alternative:

The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do-nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Environment:

The surroundings within which humans exist and that are made up of:

- the land, water and atmosphere of the earth;
- micro-organisms, plant and animal life;
- any part or combination of (i) and (ii) and the interrelationships among and between them; and
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being. This includes the economic, social, cultural, historical and political circumstances, conditions and objects that affect the existence and development of an individual, organism or group.

Environmental Assessment:

The generic term for all forms of environmental assessment for projects, plans, programmes or policies. This includes methods/tools such as environmental impact assessment, strategic environmental assessment, sustainability assessment and risk assessment

Impact:

The positive or negative effects on human well-being and / or on the environment. Environmental

Management:

Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental Management Programme:

An operational programme that organizes and coordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its on-going maintenance after implementation.

Indirect impacts:

Indirect or induced changes that may occur as a result of the activity (e.g. the reduction of water in a stream that supplies water to a reservoir that supplies water to that activity). These types if impacts include all of the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

Interested and Affected Parties (i&APs):

Individuals, communities or groups, other than the proponent or the authorities, whose interests may be positively or negatively affected by the proposal or activity and/or who are concerned with a proposal or activity and its consequences.

Lead Authority:

The environmental authority at the national, provincial or local level entrusted in terms of legislation, with the responsibility for granting approval to a proposal or allocating resources and for directing or coordinating the assessment of a proposal that affects a number of authorities.

Mitigate:

The implementation of practical measures to reduce adverse impacts or enhance beneficial impacts of an action.

Significance:

Significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. magnitude, intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of significance and acceptability).

It is an anthropocentric concept, which makes use of value judgments and science-based criteria (i.e. biophysical, social and economic).

Stakeholder engagement:

The process of engagement between stakeholders (the proponent/applicant, authorities and i&APs) during the planning, assessment, implementation and/or management of proposals or activities

Executive Summary

Environmental Management Assistance (Pty) Ltd has been appointed as the independent Environmental Assessment Practitioner (EAP) to manage the Scoping and Environmental Impact Reporting (S&EIR) process for the proposed Solar Photovoltaic (PV) Plant to Generate Up To 40 MW of Energy: Phase 2 (proposed project), Brakpan, City of Ekurhuleni Metropolitan Municipality, Gauteng Province (DMRE REF: GP158MREA). The proposed Project Site is located on Ergo Mining owned land adjacent to the Withok Estates Agricultural Holdings area of Brakpan within the City of Ekurhuleni Metropolitan Municipality, Gauteng Province.

Tshedza 3 Investments (Pty) Ltd proposes to construct the PV facility capable of generating up to 40 MW, as assessed through a Final Impact Assessment report. The aim of the proposed project is to add onto the approved Phase 1 project (19.9 MW PV, substation, 100MWh battery energy storage system (BESS), and 11km of 22kV overhead powerlines) to generate up to 59.9MW of energy in total to sustainably supply the existing Ergo Mining Brakpan Plant and the Brakpan/Withok Tailings Dam facility with clean and stable electricity during grid curtailments and outages through embedded generation. It is intended that excess energy produced by the solar energy facility (SEF) will be fed back into the grid. The mine can therefore contribute toward alleviating the current pressure on the Eskom grid through the construction of the proposed SEFs.

The proposed project triggers an application for Environmental Authorisation and is subject to a Scoping and Environmental Impact Assessment Process in terms of the National Environmental Management Act (107 of 1998) (NEMA):

1) GN R. 982: Independent EAP selected to ensure compliance with EIA procedures.
2) GN R. 983, 984 and 985: A Scoping report followed by an Impact Assessment report, both of which is to undergo public participation submitted to the DMRE for approval and issuance of an Environmental Authorisation (EA).

The environmental authorisation in terms of NEMA, will be applied for at the Gauteng DMRE. The WUL authorisation in respect of the NWA will be applied for from the Department of Water and Sanitation (DWS) in Gauteng. The proposed development will require a Water Use License (WUL) by means of a Water Use License Application (WULA) in terms of Section 40 of the National Water Act (NWA), 1998 (Act No. 36 of 1998) or Registration under a General Authorisation in terms of Section 39 of the NWA for water uses listed under Section 21 of the Act. The following water uses will be applied for:

- Section 21(a) taking water from a water resource;
- Section 21(c) impeding or diverting the flow of water in a watercourse; and
- Section 21(i) altering the bed, banks, course or characteristics of a watercourse.

The Phase 2 project is associated with the following key activities:

Activity	Description
PV panels	• Total design capacity for phase 2: 40 MW • PV Panel dimensions: 2.1m x 1.1 m • PV Panel height: 1.2 - 1.6m above ground level • Single Axis Tracking system is the preferred mounting structure solution • Footprint: ~120ha
Substations and electrical systems	• Development of a substation for Phase 2, • Inverter and transformer stations to collect the energy generated from the PV panels • Where possible, shared use of approved phase 1 PV plant and associated infrastructure • Installation of connecting lines and underground cabling from the PV panels to the Phase 1 substation and electrical system where required
Battery storage	Although approved in Phase 1, it must be noted that the position of the BESS has been optimised and shifted to fall within the Phase 2 footprint to minimise visual impacts and optimise the design of the entire 60MW facility (Phase 1 + Phase 2). Energy from Phase 2 will feed into the approved Phase 1 containerized 100MWh) battery storage system[1].
Overhead power line	• Will feed into the approved Phase 1: 22 kV overhead transmission lines where required
Access	• Upgrade of existing external access roads to the PV site and construction of new internal roads with crusher run or similar materials (not paved). o External access via route approved as per phase 1: Upgrade of existing access road/s along slurry pipeline/ and or via 18th Street via Denne and Koot Road to the PV site, parallel to Tenth Street. o An additional access point for the construction/operational phase via an existing road network to access Portion 272 of the Farm Witpoortje 117 I.R. is proposed via 17th Road- vehicles will drive past the old mine compound, continuing via an existing farm track previously used in apparent farming activities to the top of the proposed north PV block. Developer proposes to upgrade the existing farm track with gravel from below the compound to the proposed northern extent of the development.

[1]Specialist studies conducted for Phase 2 considered the optimised layout with the BESS positioned on the Phase 2 footprint.

	• Internal roads between PV infrastructure. • Low water bridge with a pole height of up to 1.3m is required as a river crossing to serve as access between the farm portions of the preferred layout area, i.e. between Farm Witpoortje 117 IR Portion 183, and Farm Witpoortje 117 IR Portion 272, for site personnel to stay within the fenced off security area. This will be utilised as an access road/ bridge crossing/ pedestrian crossing for operations and maintenance staff (suitable for pedestrian/ cycle or golf cart/ quad bike type vehicles).
Security services	• Appropriate lighting • Access control with guard house • ~5.5km fencing around the development footprint along the boundary, most likely palisade fencing, or similar. The plant area will be protected by a single wire-mesh fence of 2.6-meter-high, (barbed wire or similar on top running all along the site perimeter to be considered). Access to the site will be through the approved phase 1 motorized double gate. If required, two such access points may be provided along the fence line.
Storm water management	• Flood protection berms, canals / channels and erosion protection control measures.
Auxiliary services	Same as proposed for Phase 1, namely: • Operational power supply and use from existing Ergo Mining operations and onsite diesel generators (i.e. Eskom, existing) • Water supply and use from existing Ergo Mining operations transported via tankers to site (i.e., municipal, existing) • Waste management (private, existing)
Note: The following infrastructure from Phase 1 will be utilised for phase 2 Battery storage: The position of the approved BESS facility has been optimised to minimised visual impacts and is no longer positioned on the Phase 1 footprint (although approved), but now falls within the proposed Phase 2 footprint. Energy from Phase 2 will feed into the approved Phase 1 containerized 100 MWh battery storage system. Overhead power line: - Phase 2 will feed into the Phase 1 22 kV overhead transmission lines where required	

Alternatives considered

The location and technology proposed in the Phase 2 Solar Energy Facility (SEF) is directly linked to the location of the previously assessed Phase 1 SEF, i.e. 19.9MW Photovoltaic facility to feed into the Ergo mining works and Ergo tailings dam where an off grid energy supply is needed as per the Ergo energy needs.

Therefore, the only alternatives that were considered as part of this Impact Assessment report is the:

- Property alternatives:
  - Preferred Layout Area
    - Farm Witpoortje 117 IR Portion 183[2] (Referred to as Area A1) and
    - Farm Witpoortje 117 IR Portion 272 (Referred to as Area B)
  - Alternate Layout Area
    - Farm Witpoortje 117 IR Portion 183 (Referred to as Area A1) and
    - Farm Withok 131 IR Portion 9 (Referred to as Area C).

Summary of the key findings of the EIA- The following includes the key findings and impact statements from the specialist assessments[3]:

Flora Terrestrial biodiversity (Appendix E)	Most of the proposed site comprise secondary grassland that was either historically cultivated or contained slimes dams and other mining infrastructure. Some ecological functions are restored in the secondary grasslands, although the species diversity is low with limited potential to support plant species of conservation concern. Development activities of medium to high impact are acceptable in the secondary grasslands, followed by appropriate restoration activities where needed. Most of the eastern extent of the proposed site as well as large soil heaps or remnant slimes material were classified as modified land. These areas are developable and of little to no conservation concern. The sites fall in an area that is listed by the National Screening Tool as being of 'High' terrestrial biodiversity. Furthermore, the Screening Tool lists a 'Medium' sensitivity for plant species, indicating that there is a likelihood of plant species of conservation concern being present. The results found that although the sites are within an area of high terrestrial biodiversity, the vegetation is disturbed and in a secondary state. However, it does retain some ecological function, the rating of "high" is therefore challenged. Also, no sensitive plant species were recorded or are expected to be present in the Preferred and Alternative sites. Due to the modified and secondary nature of the vegetation, the proposed development of the PV facility, will likely have no to limited impact on sensitive vegetation. The impacts

[2] Farm Witpoortje 117 IR Portion 183 common for both the preferred and alternate layout areas.

1) [3] Findings subject to update based on specialist recommendation on the revised layout

	on the Preferred and Alternative sites are comparable with the greatest impact on moist grasslands. The wetland assessment must be consulted for the definitive boundaries of wetlands. No plant species of conservation concern were recorded in the moist grasslands and therefore the wetland specialist recommendations and buffers take preference. One protected plant species was recorded within the secondary grassland on the Alternative Site. Although the impacts are comparable, the vegetation report motivates the approval of the Preferred Site. Development on the Preferred Sites (Areas A1 and B) will concentrate the proposed activities in an area adjacent to the current mining activities and infrastructure. This will reduce edge effects to natural areas, as well as fragmentation of larger, connected open spaces. Development on the Alternative Site will fragment a larger open space that comprise of secondary and good condition grassland (Phase 1 assessment, Dimela Eco Consulting, 2021). The Alternative site is also closer to good condition grassland and moist grassland present in the Withok Estates Agricultural holdings north of the Alternative Site. If for any reason the Preferred Site is not approved, the vegetation report has no objection with the Alternative site being used for the proposed PV facility.
Fauna Terrestrial biodiversity (Appendix F)	The site and surrounds rank as high sensitivity (EIA ScreeningToolkit) for terrestrial biodiversity, but given the history of the site (old tailings facilities, historical mine areas, historical and current cultivation areas), it is expected that the on-site biodiversity value to terrestrial fauna is low. A full biodiversity impact assessment, in line with the new environmental theme's protocols where relevant to terrestrial fauna, has been completed with focus on the ecological corridors and natural habitat units. The site and surrounds rank as medium and low sensitivity (EIA Toolkit) for animal species, with one butterfly (*Aloeides dentatis dentatis*) and two mammals (*Ourebia ourebi ourebi* and *Hydrictis maculicollis*) listed as potential species of conservation concern (SCC). Due to the current status of the site in terms of historical land use and impacts, it is expected that these animals are unlikely to permanently occur in the project area, or at least be restricted to the less disturbed habitats where these are ecologically connected, and the bulk of the site will have a low value for significant animal species. In terms of the two alternative sites, the preferred site has more natural habitat units than the alternative site and closer to areas designated as highly sensitive areas (should be avoided based on wetland specialist findings), making it a marginally more important in terms of terrestrial fauna than the alternative site. However, developing the preferred site with panels will keep development clustered (closer to Phase 1 area, and existing active mine areas) and maintain the impact footprint and associated anthropogenic activity (traffic, maintenance work) to a consolidated area; it will also result in maintaining the open spaces within and around the alternative site which is within the less disturbed

	Rietspruit Tributary catchment area. Therefore, in terms of terrestrial fauna, either alternative site is considered appropriate for development. The access road is proposed over existing mine roads and tracks; the latter will result in minimal removal of vegetation; no significant loss of fauna habitat is expected, limited to marginal impact to the edges, dominated by disturbed and modified habitats (as per photographic evidence provided by faunal specialist). In terms of terrestrial fauna biodiversity, no additional faunal assessments or studies are deemed necessary. There is no reason for not authorising the activity as long as the recommendations and mitigation measures as per the fauna study are adhered to.
Avifauna (Appendix G)	The habitat within which the proposed development area is located is MODERATELY to HIGHLY sensitive from a potential bird impact perspective. In recent years, anthropogenic impacts, mostly in the form of mining and urbanisation have largely transformed the landscape resulting in a negative impact on avifaunal diversity and abundance with the study area. This is reflected in the low reporting rates for priority species, which may also indicate that levels of disturbance are high. The construction of the proposed 40MW SEF will result in impacts of MODERATE to LOW significance to birds occurring in the vicinity of the new infrastructure, which can be reduced to negligible levels through the application of mitigation measures as per the avifauna specialist report. Given the presence of existing habitat degradation and disturbance, it is the avifauna specialist's opinion that the 40MW SEF can be constructed within the Preferred Layout with acceptable levels of impact on the resident avifauna subject to the recommendations in the specialist report. In accordance with the outcomes of the avifauna impact assessment, in conjunction with the baseline conditions and the impact management measures, the proposed 40MW SEF is not deemed to present unmitigable negative environmental issues or impacts.
Surface Water Assessment (Appendix H)	Storm Water Management Assessment The proposed project development will alter the existing environmental state of the area, thereby affecting the generation of storm water from its existing state. Volumes of storm water generated over disturbed areas are generally expected to increase because of the reduction in natural vegetation, while the quality of the storm water generated is expected to decrease (silt load). These changes are, however, expected to be primarily associated with the construction and decommissioning phases of the project. The installation of PV panels mounted on concrete secured pylons/poles results in the majority of the land surface retaining its natural land-cover once rehabilitation has occurred (during the operational phase), with only the PV foundations representing a permanent change (during the operational

	phase). Additional associated project infrastructure such as roads, fences, lay down areas, offices etc. will also alter the 'natural' or existing hydrological flow regime. A simple conceptual storm water management plan has been developed for the solar PV area for both the phase 2 preferred and alternate layout option, so as to reduce potential flooding and ponding of water. The phase 2 SWMP takes cognisance of the proposed SWMP for phase 1. All proposed infrastructure has been sized to effectively route up to the 1:50 year flood event. <u>Flood Assessment</u> In this assessment, rivers intersecting both the proposed powerline (from Phase 1) and the preferred and alternative sites (from Phase 1 and Phase 2) were selected for flood modelling. The latest layout of PV arrays are noted as falling outside the modelled 1:100 year RI flood-line, with infrastructure (site road) just touching this flood-line. This layout assumes flood-line accuracy, however, as outlined there are limitations to this accuracy. To assist in offsetting potential flood risk to the site, two flood protection berms are proposed for infrastructure closest to areas of flooding (a 20m buffer of the flood-line informed flood protection). These flood protection berms should be at least 1m high (in relation to the adjacent landscape). If any infrastructure is to be positioned within the simulated flood-lines, it should be flood-compatible in nature (e.g. PV pylons with panels above the flooding). For flood sensitive infrastructure, an additional offset from the flood-line should be considered given the potential inaccuracies in the 2m DTM. There are two roads and a fence proposed as part of the preferred layout that intersect a non-perennial tributary of the Withokspruit, located between the two preferred boundary portions. A bridge design has been provided for these roads. No assessment of these two bridges has been considered with regards to their influence on flooding and their design is assumed to not alter the results of the flood modelling included in specialist report. Details of the design of this proposed infrastructure are such that they will allow for the free drainage of flows generated in this stream during flood events. Having set out the preferred layout on the basis of the modelled flood-lines, it is noted that some proposed infrastructure passes through the 1:50,000 topographical map non-perennial tributary of the Withokspruit. A site survey confirming the route of the non-perennial river should be performed given the difference between the defined river location and the modelled flooding. If necessary, flood-lines can be re-modelled using more detailed elevation data (LiDAR) to improve model confidence.

	Hydrological Impact Assessment Hydrological impacts associated with the proposed solar PV development which have been identified in this assessment include flooding, sedimentation and siltation of water courses, as well as the alteration of natural drainage patterns and associated stream flow volumes. To this end, it is recommended that the silt load in the receiving water resources immediately downstream of the site be monitored prior to construction, during construction, as well as post construction. The significance rating for the construction and operational phases for both pre and post mitigation for the alternate and preferred site options have been considered in the specialist assessment and suitable recommendations are made which result in moderate to low impacts with proposed mitigation measures.
Wetland and Aquatic Impact Assessment (Appendix I)	From a wetland perspective, the specialist is of the opinion that impacts arising from the proposed project can be mitigated to an acceptably low level. This is attributed to the historically and currently disturbed nature of the area coupled with the modified to seriously modified nature of the wetlands assessed within the study site. Even though there will be some encroachment of the solar panels into the 21m buffer, this impact is expected to be low and the storm water flow from these sites into the HGM 1 can be effectively managed. Furthermore, impacts regarding the bridge and storm water drains can also be effectively managed. In consideration of the aquatic habitat availability within the study area, it is expected that the aquatic biota assemblages present will be dominated by taxa with a strong preference for instream and emergent vegetation within very slow-flowing habitats, as well as taxa with a very low to low preference for unmodified water quality. Further, given the likely seasonal availability of water within the unchannelled and depressional wetland systems present, it is expected that the period of inundation of the watercourse will result in temporal variations of aquatic assemblages within these systems. As such the risk of impact from the proposed activity on the associated aquatic ecosystem is expected to be low. It is therefore the opinion of both authors that either the preferred or alternative layouts be approved from a wetland and aquatic perspective.
Soils, land capability and agricultural potential (Appendix J)	The study site was divided into two separate soil types, the Natural Soils and the Anthrosols and Technosols. The site (including both layout alternatives) can be considered to have a negligible to low agricultural production with regards to cultivation of crops as a result of the majority of the site (including both layout alternatives) having been anthropogenically disturbed to such a level that the natural soil profile is not generally apparent. Cultivation of crops cannot take place in these areas. It is therefore the opinion of the author that, provided mitigation measures to reduce the impact of the project on the receiving environment are

	implemented as part of the construction and operational phases of the project, either the preferred or alternative layouts be approved from an agricultural perspective.
Heritage (Appendix K)	The impact on heritage resources can be mitigated to an acceptable level and the project can be authorised provided that the recommendations in the specialist report are adhered to and based on the South African Heritage Resource Authority (SAHRA) 's approval. Both the Preferred and Alternative lay out are acceptable from a heritage point of view provided that the recommendations in this report are adhered to.
Palaeontological (Appendix L)	Based on experience and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the overlying soils of the Quaternary. In addition, the area is already disturbed by mining activities and infrastructure. There is a very small chance that fossils may occur in the below ground shales of the early Permian Vryheid Formation so a Fossil Chance Find Protocol should be added to the EMPr. If fossils are found by the contractor, environmental officer, or other responsible person once excavations for foundations, poles and infrastructure have commenced then they should be rescued and a palaeontologist called to assess and collect a representative sample. The impact on the palaeontological heritage would be low so the project should be authorised. As far as the palaeontology is concerned, there is no preference for the site of the photovoltaic collectors.
Visual (Appendix M)	The following is a summary of impacts remaining, assuming mitigation as recommended, is implemented: During construction, there may be a noticeable increase in heavy vehicles utilising the roads to the development site that may cause, at the very least, a visual nuisance to other road users and landowners in the area. The construction activities may also visually impact residents of the Withok Small Holdings south of the development site. The construction activities may potentially result in a moderate, temporary visual impact that may be mitigated to moderate to low. The operational PV facility (both alternatives) is expected to have a high visual impact on residents of the Withok Small Holdings and observers traveling along the secondary roads south of the facility. This impact can be mitigated to moderate. The operational PV facility could have a moderate visual impact on observers located between a 1 – 3km radius of the PV facility structures (residents of the Withok Small Holdings (west) and the Witpoort Estate Small Holdings) (north), both before and after the implementation of mitigation measures. The anticipated impact of lighting at the PV facility is likely to be of moderate significance, and may be mitigated to low.

	The potential visual impact related to solar glint and glare is expected to be of low significance. The anticipated visual impact resulting from the construction of on-site ancillary infrastructure is likely to be of low significance both before and after mitigation. The anticipated visual impact of the proposed PV facility on the regional visual quality, and by implication, on the sense of place, is generally expected to be of low significance. The anticipated cumulative visual impact of the proposed PV facility is expected to be of low significance. The anticipated visual impacts listed above (i.e. post mitigation impacts) range from moderate to low significance. Anticipated visual impacts on sensitive visual receptors (if and where present) in close proximity to the proposed facility are not considered to be fatal flaws for the proposed PV facility. Considering all factors, it is recommended that the development of the facility as proposed be supported; subject to the implementation of the recommended mitigation measures and management programme.
Socio-economic (Appendix N)	It is the opinion of the specialist that the proposed project should be authorised within the context of the socio-economic assessment, as the proposed project is anticipated to be of economic benefit for the local area, as well as contributing to regional renewable energy development opportunities. The employment opportunities and the multiplier effect could improve the opportunities for currently unemployed individuals and low-income households on a local and regional level. However, the manner in which the operations are carried out, must be done in line with best practice and consideration for socio-economic impacts. It is possible that not every eventuality of the potential socio-economic impacts have been detailed by this study, due to the complexity of socio-economic environment. It is, therefore, crucial that ongoing and transparent engagement, and management of issues as they arise, is carried out through the recommendations of this study. This is likely to ensure that the Withok Estates AH and other stakeholders remain in support of the proposed project and future developments, and that negative impacts on the local community are minimised and benefits are maximised.
Traffic (Appendix O)	The proposed development (Phase 2) is Renewable Energy Structures. It is expected that the proposed Phase 2 of the development will generate 21 peak hour trips during the AM and PM peak hours in the construction phase and Phase 1 & 2 of the proposed development will generate 7 peak hour trips during the operational phase. Access to the development during the construction phase is proposed from the private mine access road from 17th Road.

	Access to the proposed development during the operational phase is proposed from Denne Road / Koot Street. There are existing public transport facilities located at a nearby shopping centre. The impact of the expected trip generation of the proposed development for the construction and operation stage is negligible.

EAP Summary[4]: The proposed Ergo Mine PV Power Project (Phase 2) is seen to have a LOW to HIGH impact on the receiving environment and LOW to MODERATE if mitigation measures are implemented. Cumulative Impacts could lead to higher impact levels, however significance rating remains at a LOW for cumulative impacts with the implementation of all mitigation measures presented be followed as well as good practice guidelines and community engagement, these impacts could be mitigated to acceptable levels. Based on an understanding of the proposed solar PV project, the impact assessment and sensitivity of the affected environment, EMA is confident that the significance of anticipated impacts can be mitigated to an acceptable level. EMA is therefore of the opinion that the proposed 40MW Ergo Solar Energy Facility, and associated infrastructure should be authorised, conditional on the implementation of the mitigations and monitoring measures contained in the EMPr.

Summary of the positive and negative implications and risks of the proposed activity and identified alternatives

Summary of the positive and negative implications

Identified Impact	Significance	
	Pre Mitigation	Post Mitigation
Destruction of natural vegetation of medium sensitivity (moist grasslands)	Moderate (-ve)	Low (-ve)
Destruction of modified vegetation of low sensitivity	Moderate (-ve)	Low (-ve)
Exposure to erosion and subsequent sedimentation or pollution of proximate moist grassland	Moderate (-ve)	Low (-ve)
Removal / Destruction of protected plants and plants of conservation concern	Moderate (-ve)	Low (-ve)
Potential increase in invasive vegetation	Moderate (-ve)	Low (-ve)
Compaction and destruction of soils	Moderate (-ve)	Low (-ve)
Potential destruction of sensitive fauna habitat (Construction)	Moderate (-ve)	Low (-ve)

2) [4] Subject to an updated based on revised specialist reports

Potential destruction of sensitive fauna habitat (Operation)	Low (-ve)	Low (-ve)
Hindrance, trapping, killing of fauna, focussing on potential TOP species in the project area (Construction)	Moderate (-ve)	Low (-ve)
Hindrance, trapping, killing of fauna, focussing on potential TOP species in the project area (Operation)	Low (-ve)	Low (-ve)
Contamination of fauna environment (Construction)	Moderate (-ve)	Low (-ve)
Contamination of fauna environment (Operation)	Low (-ve)	Low (-ve)
Assessment of the habitat loss and/or transformation caused by the construction of the 40MW SEF	Low (-ve)	Low (-ve)
Assessment of the disturbance impact caused by the construction of the 40MW SEF	Low (-ve)	Low (-ve)
Assessment of mortality due to collision with the PV panels	Moderate (-ve)	Low (-ve)
Assessment of habitat impacts associated with altered run-off and chemical pollution	Low (-ve)	Low (-ve)
Impact Assessment: Flooding	Moderate (-ve)	Low (-ve)
Impact assessment: Sedimentation and siltation of water courses	Moderate (-ve)	Low (-ve)
Impact assessment: Alteration of natural drainage patterns	Moderate (-ve)	Moderate (-ve)
Soil erosion and sedimentation of wetland systems (Construction Phase)	High (-ve)	Moderate (-ve)
Pollution of wetland systems (Construction Phase)	High (-ve)	Low (-ve)
Encroachment of alien invasive vegetation (Construction Phase)	Moderate (-ve)	Low (-ve)
Construction of a bridge across HGM 1	Moderate (-ve)	Low (-ve)
Construction of drainage channels for the stormwater management of the area	Moderate (-ve)	Low (-ve)
Soil erosion and sedimentation of wetland systems (Operational Phase)	Moderate (-ve)	Low (-ve)
Pollution of wetland systems (Operational Phase)	Moderate (-ve)	Low (-ve)
Encroachment of alien invasive vegetation (Operational Phase)	Moderate (-ve)	Low (-ve)
Existence of bridge across HGM 1	Moderate (-ve)	Low (-ve)
Operation of drainage channels for the stormwater management of the area	Moderate (-ve)	Low (-ve)
Loss of agricultural productive land within the study area: Construction Phase	Low (-ve)	Low (-ve)
Soil Compaction leading to erosion and sedimentation (Construction Phase)	Moderate (-ve)	Low (-ve)

Soil Pollution (Construction Phase)	Moderate (-ve)	Low (-ve)
Soil Compaction leading to erosion and sedimentation (Operational Phase)	Moderate (-ve)	Low (-ve)
Soil Pollution (Operational Phase)	Moderate (-ve)	Low (-ve)
Construction and Operation of PV Plant	Moderate (-ve)	Low (-ve)
Palaeontological Impact Assessment (Construction)	Low (-ve)	Low (-ve)
Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed PV facility	Moderate (-ve)	Moderate (-ve)
Visual impact on observers in close proximity to the proposed PV plant structures.	High (-ve)	Moderate (-ve)
Visual impact of the proposed PV facility structures within the region.	Moderate (-ve)	Moderate (-ve)
Impact table summarising the significance of visual impact of lighting at night on visual receptors in close proximity to the proposed PV facility.	Moderate (-ve)	Low (-ve)
Impact table summarising the significance of the visual impact of solar glint and glare as a visual distraction and possible air travel hazard.	Low (-ve)	N/A
Visual impact of the ancillary infrastructure.	Low (-ve)	Low (-ve)
The potential impact on the sense of place of the region.	Low (-ve)	Low (-ve)
The Increased Employment Opportunities (Construction)	Very Low *Positive*	Low *Positive*
Increased Local Economic Development Opportunities (Construction)	Very Low *Positive*	Low *Positive*
Reduced Public Safety (Construction)	Moderate (-ve)	Low (-ve)
Increased Nuisance, Disruption and Indirect Costs (Construction)	Moderate (-ve)	Low (-ve)
Reduced access to livelihood resources (Construction)	Low (-ve)	Low (-ve)
Increased Employment Opportunities (Operation)	Very Low *Positive*	Low *Positive*
Increased local economic stimulation opportunities (Operation)	Very Low *Positive*	Low *Positive*
Increased Nuisance, Disruption and Indirect Costs (Operation)	Moderate (-ve)	Low (-ve)
Reduced public safety and security (Operation)	Moderate (-ve)	Low (-ve)

Loss of permanent jobs (Decommissioning)	Moderate (-ve)	Low (-ve)
Loss of local economic opportunities (Decommissioning)	Moderate (-ve)	Low (-ve)
Increased temporary employment (Decommissioning)	Insignificant (Positive)	Very Low (Positive)
Loss of Local Economic Development Potential (No-Development Alternative)	Moderate (-ve)	N/A
Loss of Employment opportunities	Low (-ve)	N/A
Assessment of Environmental Impact of Transport Activities during Construction	Low (-ve)	Low (-ve)
Assessment of Environmental Impact of Transport Activities during Operational Phase	Low (-ve)	Low (-ve)

Proposed Mitigation

The management objective is to minimise the socio-economic impact of the proposed PV plant and ancillary infrastructure in terms of the socio-economic perceptions and expectations of I&AP's. The outcome to be achieved is to lessen the impact through the following measures:

- Adhere to an open and transparent communication procedure with stakeholders at all times;
- Ensure that accurate information regarding the proposed activities is to be undertaken and labour commitments is communicated to I&APs;
- Ensure that information is communicated in a manner which is understandable and accessible to I&APs;
- Prevent the unnecessary destruction of, and fragmentation, of the vegetation community;
- Prevent the loss of the faunal community associated with the vegetation communities; and
- Limiting the construction area to the defined PV and OHL footprint and only impacting those areas where it is unavoidable to do so otherwise.
- Enhance project benefits and minimise negative impacts through consultation with stakeholders;
- To limit interference with existing land uses as far as possible during construction and decommissioning;
- Limit the impact on the groundwater and surface water features through the implementation of the EMPr and the impact mitigation measures.
- To avoid damage to road infrastructure; and
- To maintain safety to communities.

This report only undertakes an environmental assessment for phase 2[5] (an adjacent 40MW PV facility) to the approved Phase1[6] 19.9MW (as Zone 1 and Zone 2). Refer to Figure 1 below.

5 Phase 2: up to 40 MW PV facility to be built on adjacent properties to the approve Phase 1 (19.9MW), modularly in 4 x 10 MW bundles.
6 Phase 1, a 19.9MW PV facility with a 22kV Overhead power line and 100MWh Battery Energy Storage System (BESS) has previously been assessed and approved through a Basic Assessment Process (DMRE REF: GP 30/5/1/2/2 (158) MR).

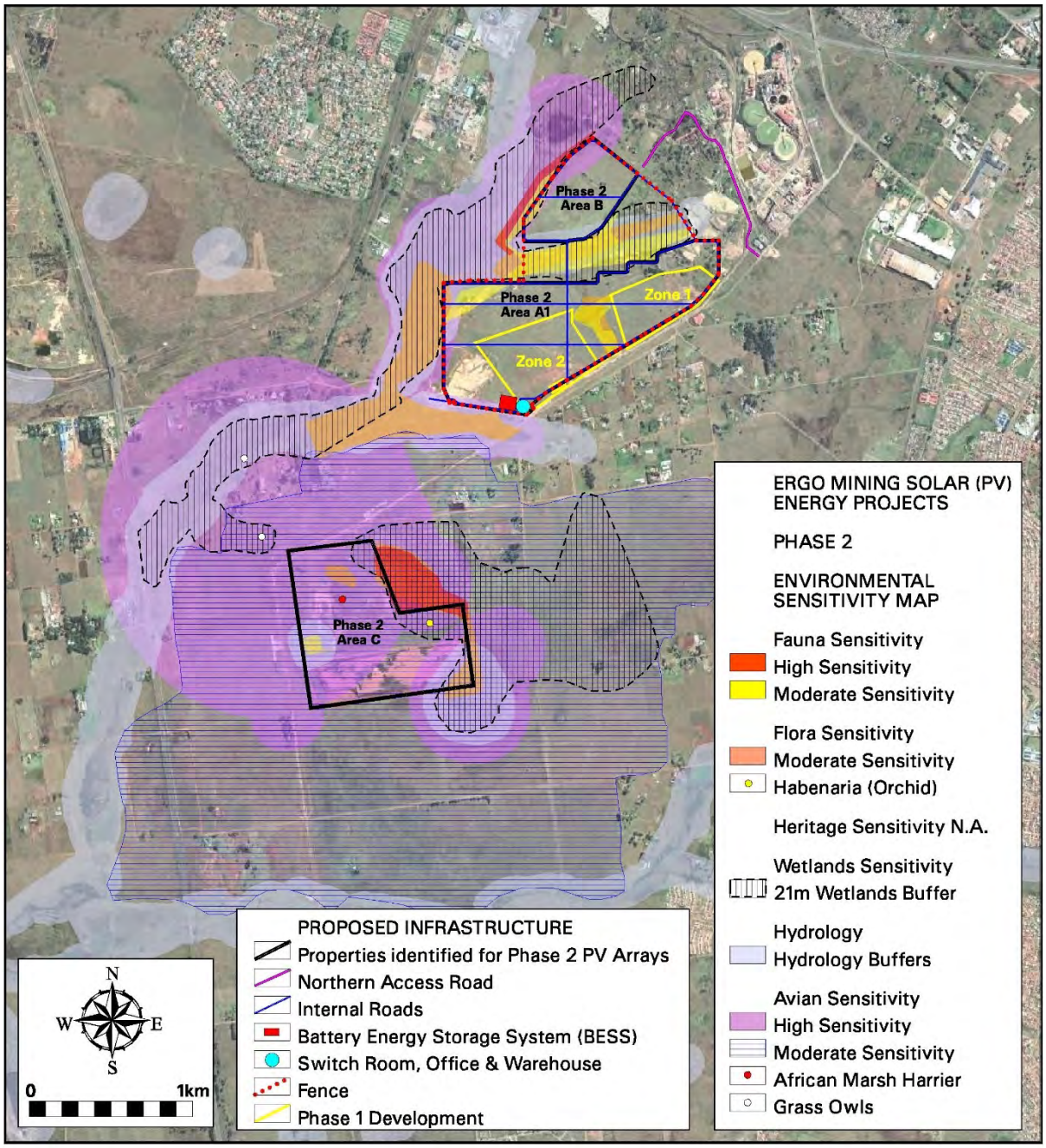


Figure 1: Sensitivity map showing both alternate sites assessed

REPORT STRUCTURE

NEMA EIA Regulations, 2014 (as amended)	Description	Section in Report
SCOPE OF ASSESSMENT AND CONTENT OF ENVIRONMENTAL IMPACT ASSESSMENT REPORTS: Part A		
Appendix 3(3)(a):	Details of – (i) The EAP who prepared the report; and (ii) The expertise of the EAP, including a curriculum vitae;	Part A Section 3a
Appendix 3(3)(b):	The location of the development footprint of the activity on the approved site as contemplated in the accepted scoping report, including: (i) The 21 digit Surveyor General code of each cadastral land parcel; (ii) Where available, the physical address and farm name; and (iii) Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Part A Section 3b Section 3c
Appendix 3(3)(c):	A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is – (i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; (ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Part A Section 3c
Appendix 3(3)(d):	A description of the scope of the proposed activity, including – (i) All listed and specified activities triggered and being applied for; and (ii) A description of the associated structures and infrastructure related to the development;	Part A Section 3d
Appendix 3(3)(e):	A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	Part A Section 3e
Appendix 3(3)(f):	A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred development footprint within the approved site as contemplated in the accepted scoping report;	Part A Section 3f
Appendix 3(3)(g):	A motivation for the preferred development footprint within the approved site as contemplated in the accepted scoping report;	Part A Section 3g
Appendix 3(3)(h):	A full description of the process followed to reach the proposed development footprint within the approved site as contemplated in the accepted scoping report, including: Details of all the alternatives considered; (i) details of the development footprint alternatives considered;	Part A Section 3h

NEMA EIA Regulations, 2014 (as amended)	Description	Section in Report
	(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them; (iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated; (vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks; (vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects; (viii) the possible mitigation measures that could be applied and level of residual risk; (ix) if no alternative development footprints for the activity were investigated, the motivation for not considering such; and (x) a concluding statement indicating the location of the preferred alternative development footprint within the approved site as contemplated in the accepted scoping report;;	
Appendix 3(3)(i):	A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred development footprint on the approved site as contemplated in the accepted scoping report through the life of the activity, including— (i) A description of all environmental issues and risks that were identified during the environmental impact assessment process; and (ii) An assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Part A Section 3i
Appendix 3(3)(j):	An assessment of each identified potentially significant impact and risk, including – (i) Cumulative impacts;	Part A Section 3j

NEMA EIA Regulations, 2014 (as amended)	Description	Section in Report
	(ii) The nature, significance and consequence of the impact and risk; (iii) The extent and duration of the impact and risk; (iv) The probability of the impact and risk occurring; (v) The degree to which the impact and risk can be reversed; (vi) The degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) The degree to which the impact and risk can be mitigated;	
Appendix 3(3)(k):	Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final assessment report;	Part A Section 3k
Appendix 3(3)(l):	An environmental impact statement which contains – (i) A summary of the key findings of the environmental impact assessment; (ii) A map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicting any areas that should be avoided, including buffers; and (iii) A summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Part A Section 3l
Appendix 3(3)(m):	Based on the assessment, and where applicable, recommendations from specialist reports, the recording of proposed impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;	Part A Section 3m
Appendix 3(3)(n):	The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;	Part A Section 3n Section 3p (ii)
Appendix 3(3)(o):	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Part A Section 3O
Appendix 3(3)(p):	A description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Part A Section 3p
Appendix 3(3)(q):	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Part A Section 3q
Appendix 3(3)(r):	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required and the date on which the activity will be concluded and the post construction monitoring requirements finalised;	Part A Section 3r

NEMA EIA Regulations, 2014 (as amended)	Description	Section in Report
		Part B Section 2
Appendix 3(3)(s):	An undertaking under oath or affirmation by the EAP in relation to— (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	Part A Section 3s
Appendix 3(3)(t):	Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	Part A Section 3t
Appendix 3(3)(u):	An indication of any deviation from the approved scoping report, including the plan of study, including— (i) any deviation from the methodology used in determining the significance of potential environmental impacts and risks; and (ii) a motivation for the deviation;	Part A Section 3u
Appendix 3(3)(v):	Any specific information that may be required by the competent authority; and	Part A Section 3v
Appendix 3(3)(w):	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	Part A Section 3w
EMPr: Part B		
Appendix 4(1)(1)(a):	Details of – (i) The EAP who prepared the EMPR; and (ii) The expertise of that EAP to prepare an EMPR, including a curriculum vitae;	Part B Section 1a
Appendix 4(1)(1)(b):	A detailed description of the aspects of the activity that are covered by the EMPR as identified by the project description;	Part B Section 1a
Appendix 4(1)(1)(c):	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Part B Section 1c
Appendix 4(1)(1)(d):	A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified though the environmental impact assessment process for all	Part B Section 1d

NEMA EIA Regulations, 2014 (as amended)	Description	Section in Report
	phases of the development including – (i) Planning and design; (ii) Pre-construction activities; (iii) Construction activities; (iv) Rehabilitation of the environment after construction and where applicable post closure; and (v) Where relevant, operation activities;	
Appendix 4(1)(1)(f):	A description of proposed impact management actions, identifying the manner in which the impact management contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to – (i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) Comply with any prescribed environmental management standards or practices; (iii) Comply with any applicable provisions of the ac regarding closure, where applicable; and (iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	Part B Section 1e
Appendix 4(1)(1)(g):	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Part B Table 91
Appendix 4(1)(1)(h):	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Part B Table 91
Appendix 4(1)(1)(i):	An indication of the persons who will be responsible for the implementation of the impact management actions;	Part B Table 91
Appendix 4(1)(1)(j):	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Part B Table 91
Appendix 4(1)(1)(k):	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Part B Table 91
Appendix 4(1)(1)(l):	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Part B Section 1l
Appendix 4(1)(1)(m):	An environmental awareness plan describing the manner in which – (i) The applicant intends to inform his or her employees of any environmental	Part B Section 1m

NEMA EIA Regulations, 2014 (as amended)	Description	Section in Report
	risk which may result from their work; and Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
Appendix 4(1)(1)(n):	Any specific information that may be required by the competent authority.	Part B Section 1n

PART A

SCOPE OF ASSESSMENT AND CONTENT OF ENVIRONMENTAL IMPACT ASSESSMENT REPORTS

3. Contact Person and correspondence address

The aim of an Independent Power Producer (IPP) is to generate electricity, and in line with best practice, the IPP must strive to do so in a sustainable manner to avoid co-lateral environmental damage. As such, the proposed project requires the services of an independent Environmental Assessment Practitioner and SACNASP registered professional to undertake a Scoping and Environmental Impact Reporting (S&EIR) process associated with the application for environmental authorisation as required for the proposed 40MW Solar Energy Facility (SEF) on Ergo Mining owned land triggering associated listed activities in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) as amended (NEMA). The application is to be submitted to the National Department of Mineral and Resources and Energy (DMRE) on behalf of Tshedza 3 Investments (Pty) Ltd (applicant) for the proposed Solar Photovoltaic (PV) Plant to Generate up to 40 MW of Energy in Brakpan, City of Ekurhuleni Metropolitan Municipality, Gauteng Province (DMRE REF: GP158MREA) (hereafter referred to as "Phase 2" or the "proposed project").

The International Finance Corporation (IFC) also recommends that an Environmental Impact Assessment (EIA) process is undertaken by an experienced Independent Environmental Assessment Practitioner (EAP) and specialists. This is in line with EIA regulations section 13, which further stipulates that an EAP and specialists must be knowledgeable of NEMA and the EIA regulations and guidelines required to undertake a specific activity to ensure compliance as such. The EAP must run a transparent process and disclose all findings of the study to the proponent, registered interested and affected parties (I&APs) and the Competent Authority (CA) of the proposed development.

Tshedza 3 Investments (Pty) Ltd appointed Environmental Management Assistance (Pty) Ltd as an independent EAP to undertake a S&EIR process for the proposed project. Contact details are as follows:

a. DETAILS OF

i. the EAP

Table 1: Details of EAP

Name of The Practitioner:	Alicia Govender
Tel No.:	083 784 0460
Fax No. :	086 226 7324
e-mail address:	alicia@hunadigroup.co.za

ii. Expertise of the EAP

A detailed portfolio of the team members associated with the management and compilation of reports presented for this project can be found in Appendix B.

a) The qualifications of the EAP

*(With evidence attached as **Appendix B**)*

The EAP project team consists of Deon Esterhuizen (Review and sign off) and Alicia Govender (Senior Environmental Assessment Practitioner).

Mr. Deon Esterhuizen is a certified Professional Natural Scientist (Registration Number: 400154/09) with a MSc in Environmental Management.

Mrs. Alicia Govender holds a master's degree (LLM) in Environmental Law.

Table 2: Names, details and expertise of EAPs

Names of EAP	Education Qualifications	Professional affiliations	Relevant experience (years)
Mr. Deon Esterhuizen	MSc in Environmental Management	Professional Natural Scientist (Registration Number: 400154/09)	29
Mrs. Alicia Govender	LLM Environmental Law	EAPASA registration in progress	14

b) Summary of the EAP's past experience.

*(Attach the EAP's curriculum vitae as **Appendix B**)*

Environmental Management Assistance (Pty) Ltd (hereafter referred to as "EMA") (Registration No 2013/154475/07) is a specialist environmental consulting company established in May 2013. The company benefits from the pooled resources, diverse skills and experience in the fields of environmental and renewable energy held by its team (refer to Appendix A for the Company profile). EMA was established for the purpose of providing a holistic and professional environmental management assistance and service to public and private sector clients.

Mr. Deon Esterhuizen has over 29 years of experience in water related projects, which include water quality management, registration and licencing of water users, completion of Environmental Impact Assessments in support of the issuing of Record of Decisions/ Environmental Authorisations, development of a management guide for domestic water use, project management, and implementation of the Resource Directed Measures as required by the Department of Water and Sanitation (DWS).

Mrs. Alicia Govender is a senior EAP having gained extensive experience in the last 14 years, specialising in Environmental Management. She started as an EAP in 2008 where she led a number of environmental assessments, with involvement in public participation and Water Use Licence Applications. Other areas of expertise include Waste Management, Project Management as well as Business Development of renewable energy projects in South Africa and other African Countries. Having been especially involved in solar developments over the last 7 years, Alicia has a focussed interest in renewable energy projects (EAPASA registration in progress).

A detailed description of all past experiences is available in Appendix B.

c) Declaration of Independence:

Tshedza 3 Investments (Pty) Ltd appointed EMA as an independent specialist consultant to undertake the environmental impact assessment process for the proposed project. Neither EMA nor any of its EAPs will benefit from the outcome of the project decision-making, except for reasonable compensation for professional services provided (Refer to Appendix O).

d) Appointed Specialists

Specialists that form part of the S&EIR project team are indicated in Table 3.

Table 3: Specialists form part of the S&EIR project team:

Specialist Aspect	Name of Specialist	Appendix to report

Public Participation	Chantel Muller	Appendix D
Flora Terrestrial biodiversity Impact Assessment	Barbara Kasl	Appendix E
Fauna Terrestrial biodiversity Impact Assessment	Antoinette Eyssell-Knox	Appendix F
Avifauna Impact Assessment	Megan Diamond	Appendix G
Surface Water Assessment and Strom water management Impact Assessment	Luke Wiles	Appendix H
Wetland Impact Assessment and Aquatic Impact Assessment Impact Assessment	Rowena Harrison and Byron Grant	Appendix I
Soils, land capability and agricultural potential Impact Assessment	Rowena Harrison	Appendix J
Heritage Impact Assessment	Jaco Van der Walt	Appendix K
Palaeontological Impact Assessment	Prof Marion Bamford	Appendix L
Visual Impact Assessment	Lourens du Plessis	Appendix M
Socio-economic Impact Assessment	Danielle Saunderson	Appendix N
Traffic Impact Assessment	Nico Jonker	Appendix O

b. LOCATION OF THE DEVELOPMENT FOOTPRINT

The proposed development footprint is located on Ergo Mining owned land adjacent to the Withok Estates Agricultural Holdings and Witpoort Estates Agricultural Holdings areas of Brakpan within the City of Ekurhuleni Metropolitan Municipality, Gauteng Province.

The main access routes to the region include the N17 national road, the R23 and R554 arterial roads, and a number of lower order secondary roads and streets. Access to the development footprint, from the N17, is along the Ergo Road, 17th road and 10th Street/ and or via 18th Street via Koot and Denne Roads (as approved for Phase 1), and an additional access point for the construction/operational phase via an existing road network to access Portion 272 of the Farm Witpoortje 117 I.R. is proposed via 17th Road- vehicles will drive past the old mine compound, continuing via an existing farm track previously used in apparent farming activities to the top of the proposed north PV block. Developer proposes to upgrade the existing farm track with gravel from below the compound.

Refer to Figure 2 for the locality of the proposed development (included in Appendix C). The Table 4 provides details on the properties affected by the proposed PV development.

Table 4: Description of property

Farm Name:	Preferred Layout Farm Witpoortje 117 IR Portion 183 (common for preferred and alternate layouts assessed) Farm Witpoortje 117 IR Portion 272
	Alternate Layout Farm Witpoortje 117 IR Portion 183 Farm Withok 131 IR Portion 9
Application area (Ha) :	~120 ha (Preferred)
Magisterial district:	City of Ekurhuleni Metropolitan Municipality
Distance and direction from nearest town:	The development footprint is approximately 5km south of Brakpan and approximately 9km south-west of Springs, Gauteng Province.
21 digit Surveyor General Code for each farm portion:	T0IR00000000011700183 T0IR00000000011700272 T0IR00000000013100009

c. SITE PLAN

Refer to Figure 2 for the proposed site plan (included in Appendix C).

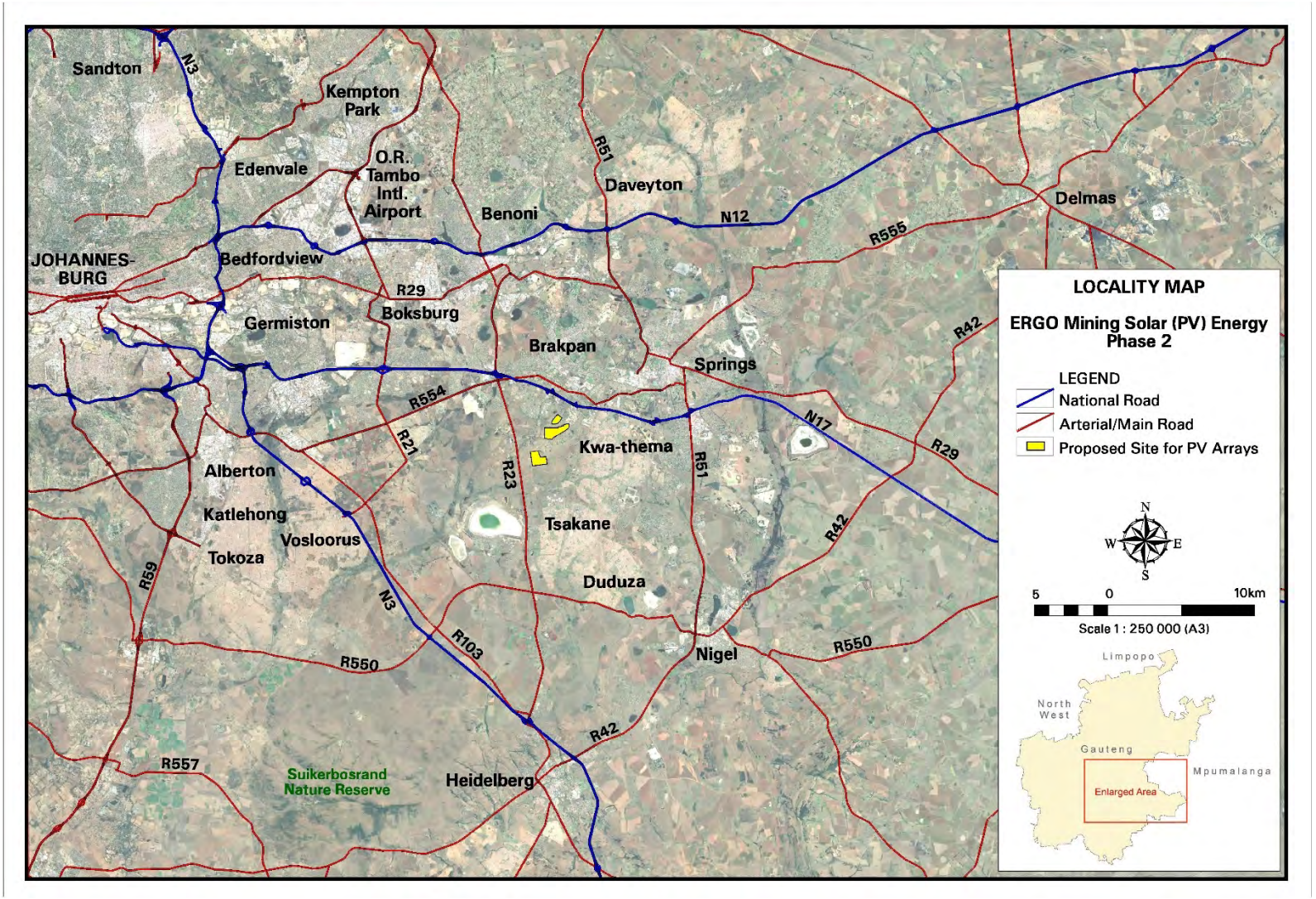


Figure 2: Locality Map of the proposed activities (1:250 000 scale)

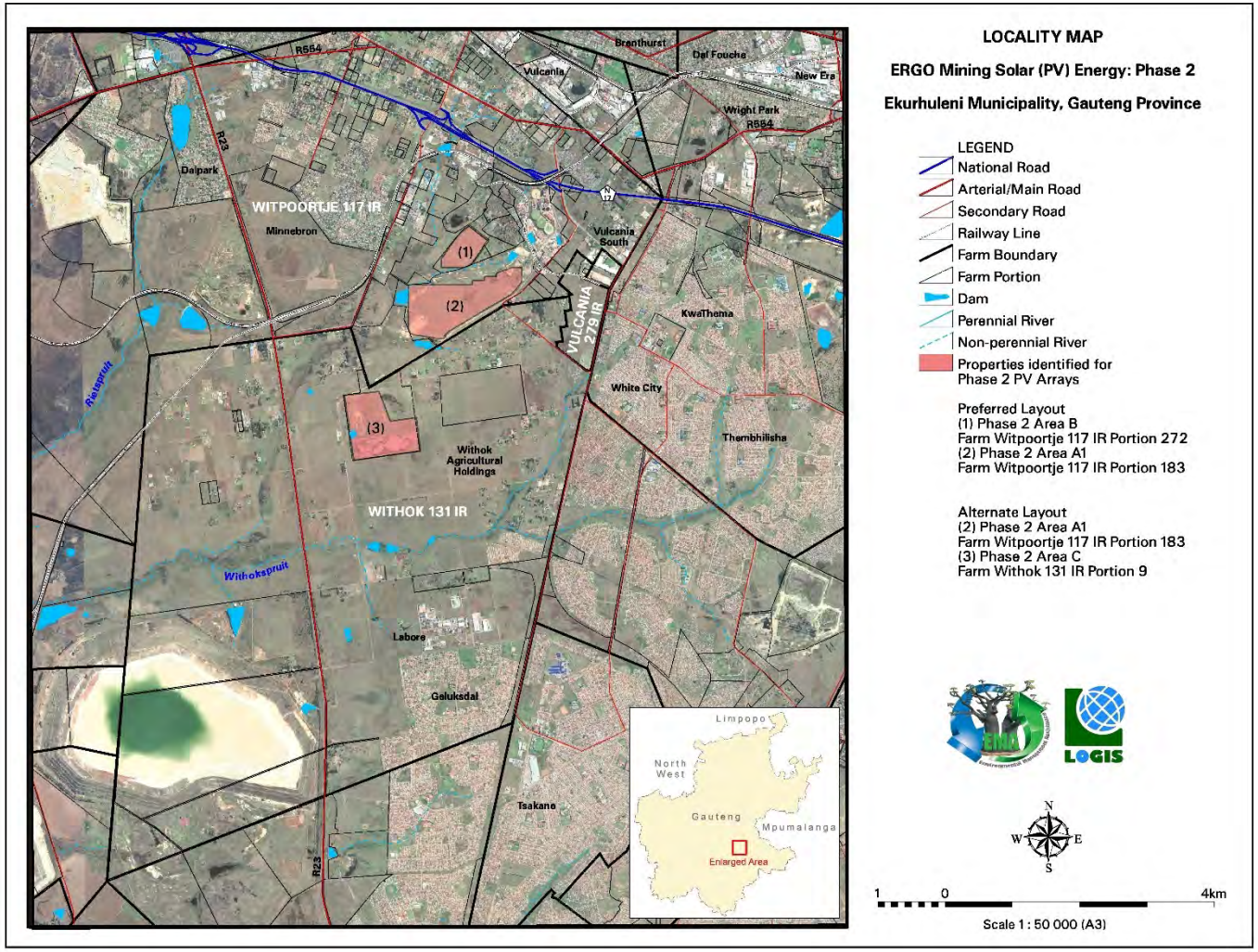


Figure 3: Locality Map of the proposed activities (1:50 000 scale)

d. DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN

Refer to Figure 5 and Figure 6 for the proposed Plan drawn to scale.

Tshedza 3 Investments (Pty) Ltd proposes to construct a PV facility capable of generating up to 40 MW, as assessed through this EIA report. The aim of the proposed project is to add onto the approved Phase 1 project (19.9 MW PV, substation, 100MWh battery energy storage system (BESS), and 11km of 22kV overhead powerlines) to generate up to 59.9MW of energy in total to sustainably supply the existing Ergo Mining Brakpan Plant and the Brakpan/Withok Tailings Dam facility with clean and stable electricity during grid curtailments and outages through embedded generation. It is intended that excess energy produced by the solar energy facility (SEF) will be fed back into the grid. The mine can therefore contribute toward alleviating the current pressure on the Eskom grid through the construction of the proposed SEFs.

The proposed project will take approximately twelve to fifteen months to construct, and the operational lifespan of the facility is estimated at twenty to twenty-five years (up to 30 years), which could be renewed every five years. Functionality of the proposed facility could potentially result in a thirty-year operational lifespan. It must be noted that the proposed Phase 2 (40MW) PV plant is to be built in addition to the approved Phase 1 (19.9MW), and involves the addition of a 40MW solar field, i.e. extension of the underground MV cabling; inverters and minisubs, solar panels and structures, roads and storm water management.

The proposed project entails the following infrastructure:

1) Solar PV array footprint comprising of:
    a) PV panels with an export capacity of up to 40MW (footprint to be determined in Impact Assessment Phase);
    b) Single axis mounting structures to support the PV panels. The PV panels will be mounted at an appropriate height (approximately 1.2m – 1.6m Above Ground Level (AGL)) so as to receive the maximum amount of solar radiation without the buffeting effects of the wind. The angle of the panel moves and tracks the sun for the maximum amount of solar radiation to be collected throughout the day;
2) Inverter and transformer stations to collect the energy generated from the PV panels and convert the electricity from direct to alternating current which can be evacuated into the electricity distribution grid;
3) Cabling between the project components (usually underground, but dependent on design);
4) Access roads, internal distribution roads. Internal roads will be built by grading, compacting, and covering the roads with a suitable aggregate. Tar or asphalt will not be used inside the PV plant. (road lengths estimated at 11,5 km);
5) Low water bridge with a pole height of up to 1.3m is required as a river crossing to serve as access between the farm portions of the preferred layout area, i.e. between Farm Witpoortje 117 IR Portion 183,

and Farm Witpoortje 117 IR Portion 272, for site personnel to stay within the fenced off security area. This will be utilised as an access road/ bridge crossing/ pedestrian crossing for operations and maintenance staff (suitable for pedestrian/ cycle or golf cart/ quad bike type vehicles).

6) ~5.5km fencing around the development footprint along the boundary, most likely palisade fencing, or similar. The plant area will be protected by a single wire-mesh fence of 2.6-meter-high, (barbed wire or similar on top running all along the site perimeter to be considered). Access to the site will be through the approved phase 1 motorized double gate. If required, two such access points may be provided along the fence line.
7) Battery storage approved in Phase 1 but moved during optimisation process to Phase 2 footprint.
8) The approved phase 1 component 22kV grid connection infrastructure will be used;
9) The approved phase 1 component Admin block will be used by this additional (phase 2) 40MW proposal;
10) Additional infrastructure includes:
    a) Power during construction to be supplied by a diesel generator under abnormal circumstances. Most likely grid power will be supplied to the site during construction from the approved Phase 1 project component; the contractor will pay for such power.
    b) Internet infrastructure from the phase 1 component within the site will be expanded to the new phase 2 components. This infrastructure will become permanent for real time remote monitoring of operations.
    c) The phase 1 component Water filtration and reticulation system (not resulting in brine disposal requirements) is available for cleaning of the additional modules.
    d) During construction temporary site offices/ workshops will be erected.
    e) During construction temporary storage and laydown areas will be erected and secured, i.e., a hazardous storage facility.
11) Upon completion of construction the site will be rehabilitated so that soil erosion is mitigated.

Table 5: Overview of key project activities

Activity	Description
PV panels	• Total design capacity for phase 2: 40 MW • PV Panel dimensions: 2.1m x 1.1 m • PV Panel height: 1.2 - 1.6m above ground level • Single Axis Tracking system is the preferred mounting structure solution • Footprint: ~120ha
Substations and electrical systems	• Development of a substation for Phase 2, • Inverter and transformer stations to collect the energy generated from the PV panels

	• Where possible, shared use of approved phase 1 PV plant and associated infrastructure • Installation of connecting lines and underground cabling from the PV panels to the Phase 1 substation and electrical system where required
Battery storage	Although approved in Phase 1, it must be noted that the position of the BESS has been optimised and shifted to fall within the Phase 2 footprint to minimise visual impacts and optimise the design of the entire 60MW facility (Phase 1 + Phase 2). Energy from Phase 2 will feed into the approved Phase 1 containerized 100MWh) battery storage system[7].
Overhead power line	• Will feed into the approved Phase 1: 22 kV overhead transmission lines where required
Access	• Upgrade of existing external access roads to the PV site and construction of new internal roads with crusher run or similar materials (not paved). o External access via route approved as per phase 1: Upgrade of existing access road/s along slurry pipeline/ and or via 18th Street via Denne and Koot Road to the PV site, parallel to Tenth Street. o An additional access point for the construction/operational phase via an existing road network to access Portion 272 of the Farm Witpoortje 117 I.R. is proposed via 17th Road- vehicles will drive past the old mine compound, continuing via an existing farm track previously used in apparent farming activities to the top of the proposed north PV block. Developer proposes to upgrade the existing farm track with gravel from below the compound to the proposed northern extent of the development. • Internal roads between PV infrastructure. • Low water bridge with a pole height of up to 1.3m is required as a river crossing to serve as access between the farm portions of the preferred layout area, i.e. between Farm Witpoortje 117 IR Portion 183, and Farm Witpoortje 117 IR Portion 272, for site personnel to stay within the fenced off security area. This will be utilised as an access road/ bridge crossing/ pedestrian crossing for operations and maintenance staff (suitable for pedestrian/ cycle or golf cart/ quad bike type vehicles).
Security services	• Appropriate lighting

[7]Specialist studies conducted for Phase 2 considered the optimised layout with the BESS positioned on the Phase 2 footprint.

	• Access control with guard house • ~5.5km fencing around the development footprint along the boundary, most likely palisade fencing, or similar. The plant area will be protected by a single wire-mesh fence of 2.6-meter-high, (barbed wire or similar on top running all along the site perimeter to be considered). Access to the site will be through the approved phase 1 motorized double gate. If required, two such access points may be provided along the fence line.
Storm water management	• Flood protection berms, canals / channels and erosion protection control measures.
Auxiliary services	Same as proposed for Phase 1, namely: • Operational power supply and use from existing Ergo Mining operations and onsite diesel generators (i.e. Eskom, existing) • Water supply and use from existing Ergo Mining operations transported via tankers to site (i.e., municipal, existing) • Waste management (private, existing)
Note: The following infrastructure from Phase 1 will be utilised for phase 2 Battery storage: The position of the approved BESS facility has been optimised to minimised visual impacts and is no longer positioned on the Phase 1 footprint (although approved), but now falls within the proposed Phase 2 footprint. Energy from Phase 2 will feed into the approved Phase 1 containerized 100 MWh battery storage system. Overhead power line: - Phase 2 will feed into the Phase 1 22 kV overhead transmission lines where required	

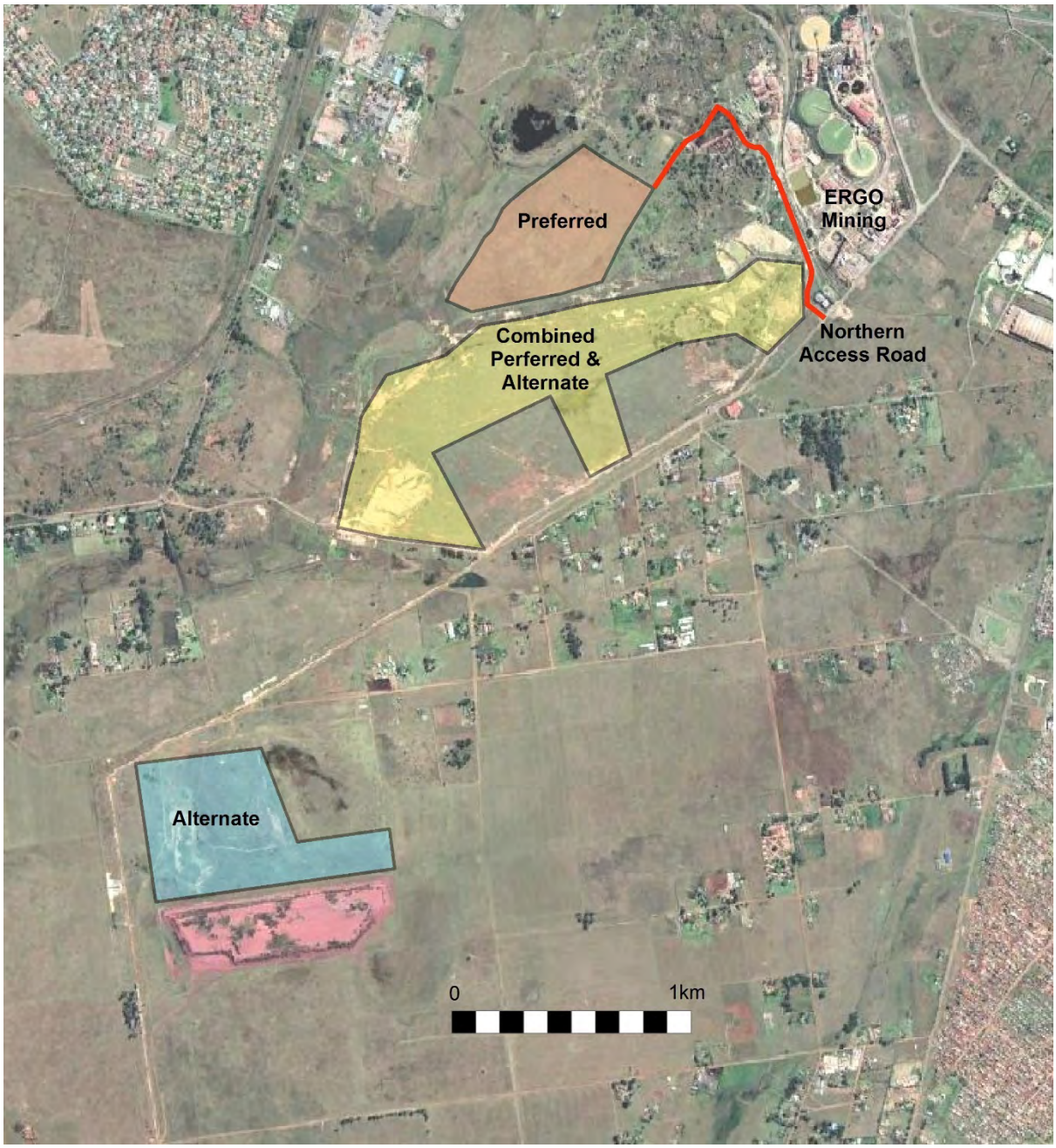


Figure 4: Ergo SEF layout alternatives considered through the EIA

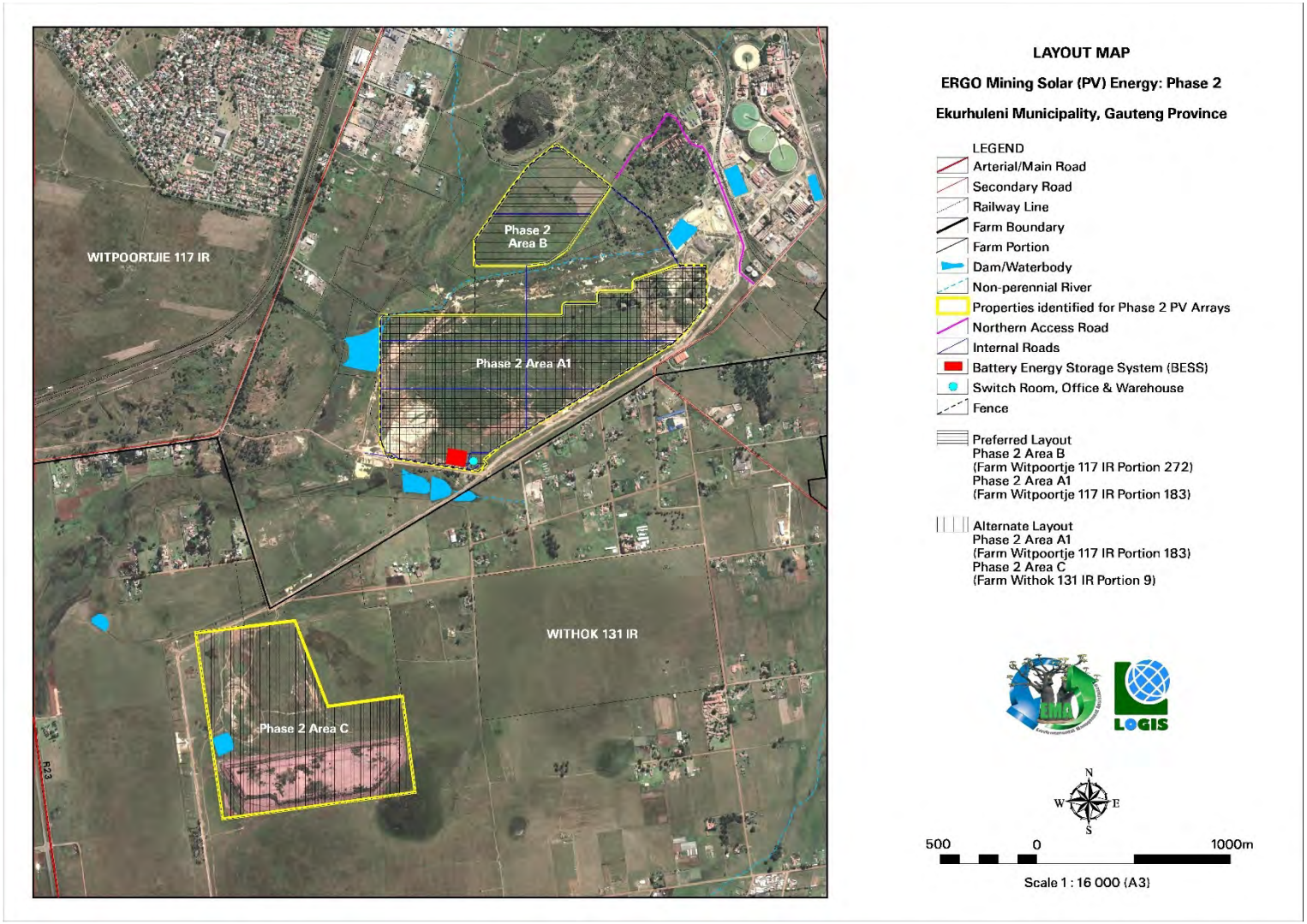


Figure 5: Site Plan of the PV footprint drawn to scale

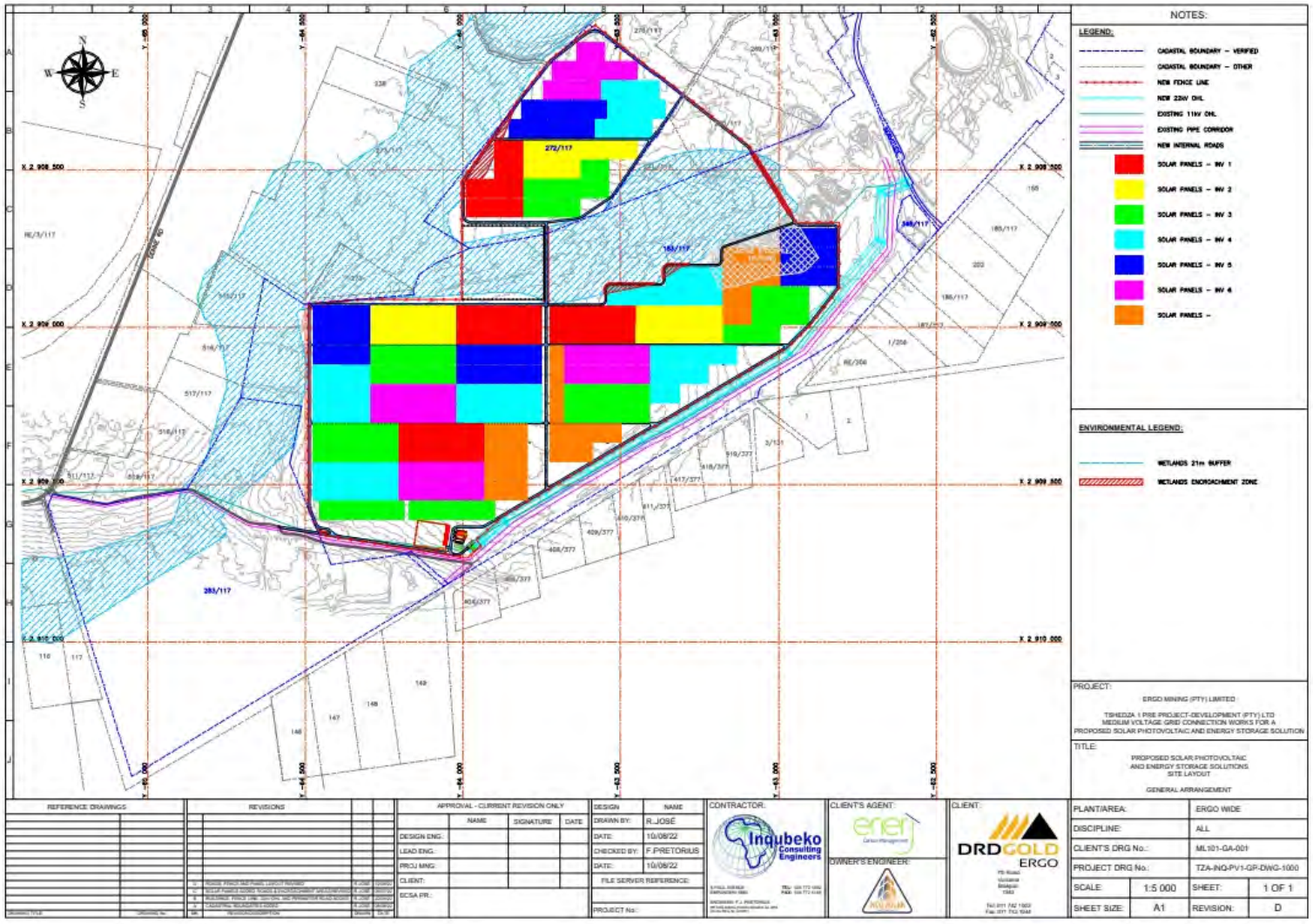


Figure 6: Preliminary detailed design of PV plant and associated infrastructure drawn to scale of Phase 1 and 2 combined (59.9MW)) (included in Appendix C)

Lightning Protection

A lightning protection system will be required for coverage of the entire proposed project. A natural air termination system and a natural down-conductor system connected to the PV plant earthing protection system will form the lightning protection system. Lightning conductors will be mounted on the roof of the containers and on the transformer stations.

Technology -PV

The proposed Ergo SEF will utilise a proven PV technology that has been tried and tested for over 20 years, and anticipates up to 90% efficiency up to the 25th year of operation. The Single Axis Tracking system is the preferred mounting structure solution (Refer to Figure 7 and Figure 8). The design allows for each PV table to consist of 3 rows of panels to facilitate easy cleaning and maintenance of modules. Both the solar DC and AC cables will be hidden visually as a mitigation measure against theft. The DC cables will be strung along the mountings in wire trays to the DC junction boxes and the AC cables will be laid underground.

String inverters are proposed with the added benefit of negligible down time losses, easier maintenance, and use of much less land / concrete slabs, as they will be mounted onto the shady side of the PV tables.

Figure 7: Single Axis Tracking for Panel Mounting

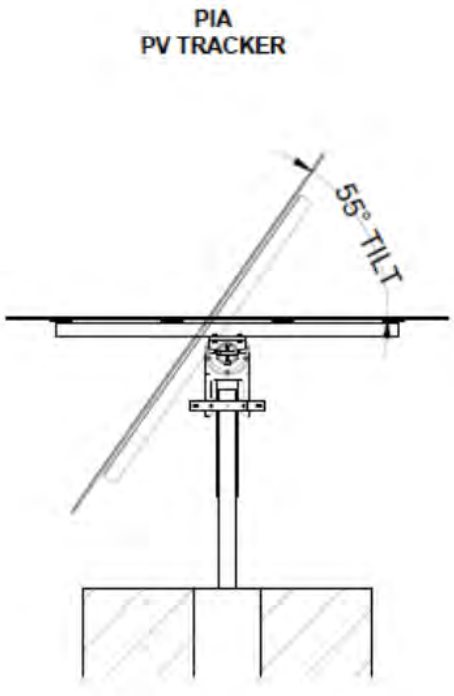


Figure 8: Detail of the proposed PV tracking system

i.Listed and specified activities

Table 6: Listed and specified activities

NAME OF ACTIVITY (*All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)*	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE *(GNR 544, GNR 545 or GNR 546)/NOT LISTED*
Construction of a Photovoltaic (PV) facility and ancillary infrastructure to generate up to 40MW Peak of electricity to operate mining works in surrounding areas on disturbed mining owned land.	80-100 ha	x	GN.R 983: (12) The development of— (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more;

NAME OF ACTIVITY (*All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)*	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (*GNR 544, GNR 545 or GNR 546)/NOT LISTED*
The proposed project entails the construction of a Solar PV Energy Facility. Based on the screening study and the biodiversity specialist reports, a large portion of the proposed site has extensively been disturbed from mining operations and tailings management. It should be noted that the site falls within an urban area. Proposed infrastructure could potentially be developed within 32m of a watercourse. A Water Use Licence will be applied for. Electricity is required for the processing of minerals through mining operations for the mine to operate in a more carbon neutral capacity through the use of renewable energy. The proposed PV facility is expected to be decommissioned at the end of it's operational life, i.e. 20- 25years (up to 30 years).			where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; — GN.R 983: (19) The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; … GN.R 983: (26) Residential, retail, recreational, tourism, commercial or institutional developments of 1 000 square metres or more, on land previously used for mining or heavy industrial purposes; — excluding — (i) where such land has been remediated in terms of part 8 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; or (ii) where an environmental authorisation has been obtained for the decommissioning of such a mine or industry in terms of this Notice or any previous NEMA notice; or

NAME OF ACTIVITY (*All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)*	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (*GNR 544, GNR 545 or GNR 546)/NOT LISTED*
			(iii) where a closure certificate has been issued in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) for such land. GN.R 983 (27) The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— (i)the undertaking of a linear activity; or (ii)maintenance purposes undertaken in accordance with a maintenance management plan. GN.R 984 (1) The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, excluding where such development of facilities or infrastructure is for photovoltaic installations and occurs – (a) within an urban area; or (b) on existing infrastructure. GN.R 984 (15) The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for –

NAME OF ACTIVITY (*All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)*	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (*GNR 544, GNR 545 or GNR 546)/NOT LISTED*
			(i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan. GN.R 985 (10) The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres.
Access roads are required to gain access to the PV facility, but existing roads will be used where possible.		x	GN.R 983: (12) The development of— (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; — GN.R 983: (19) The infilling or depositing of any material of more than 10 cubic metres into, or the

NAME OF ACTIVITY (*All activities including activities not listed) (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)*	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (*GNR 544, GNR 545 or GNR 546)/NOT LISTED*
			dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; … GN.R 983 (24) The development of a road – (i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; Does not potentially trigger a listed activity- to be further investigated in impact Assessment Phase, as - Site falls in an urban area - Road width anticipated to be limited to 6m (i.e. not wider than 8m) - Road access not fall within a protected area. GN.R 985 (4) The development of a road wider than 4 metres with a reserve less than 13,5 metres.

ii.Description of the activities to be undertaken

Describe methodology or technology to be employed

A S & EIR process is being followed for the proposed project.

The two mining facilities i.e., Ergo Mining Brakpan Plant and the Brakpan/Withok Tailings Dam facility, are currently supplied with electricity by Eskom via an existing grid infrastructure. The proposed PV facility will generate electricity, to interface with the Eskom grid to supply the Ergo Mining Brakpan Plant and the Brakpan/Withok Tailings Facility, with the connection of 100MWh battery storage proposed from phase 1. The electricity generated is primarily intended to supply the Ergo Mining Brakpan Plant and the Brakpan/Withok Tailings Dam facility, and surplus electricity may be provided to other mines in the area.

The electricity generated from the proposed project footprint will be stepped up to 22kV at the solar field minisubs on the Ergo SEF side (19.9MW + 40 MW), to tie in with the approved phase 1 22kV Substation and overhead powerline transporting power to the Consumer Substation and export to the Eskom network via the Ergo Tailings Dam Substation. It is Ergo Mine's intention to facilitate the appointment of an IPP to own, operate and manage the proposed phase 2 facility through a PPA with an option to also buy their (Ergo) investment in the phase 1 19.9MW facility if terms are favourable. This will be handled in accordance with required environmental and statutory permits.

The proposed project (Phase 2), a 40MW PV facility, is designed to tie in with the planned (and approved) Phase 1 project, a 19.9MW PV facility, and forms part of Ergo Mine's holistic energy plans to develop, own, and operate a total proposed ~60MW PV facility, which is to be developed in a phased approach (this report only undertakes an environmental assessment for phase 2. Phase 1 has previously been assessed and approved through a separate Basic Assessment Process (DMRE REF: GP 30/5/1/2/2 (158) MR) in line with the Ergo's energy requirements. Below project description provides clarity:

1) Phase 1 as assessed through a Basic Assessment Report encompasses the development of up to 19.9MW Ergo SEF with the containerised 100MWH Battery Power facility and the 22kV overhead power line connection.

2) Phase 2: up to 40 MW PV facility will be built on adjacent properties, modularly in 4 x 10 MW bundles. Phase 2, is currently being assessed through a separate EIA process (this report) with cumulative impacts taken into consideration, in accordance with the National Environmental Management Act 107 of 1998 (NEMA) and the Environmental Regulations 2014 (as amended).

e. POLICY AND LEGISLATIVE CONTEXT

This section provides the detailed description of the policy and legislative context associated with the proposed PV Project (Phase 2: 40MW).

Table 7: Applicable Legislation and guidelines

Applicable Legislation and Guidelines	Reference Where Applied (i.e. where in this document has it been explained how the development complies with and responds to the legislation and policy context)	How does this Development Comply with and Respond to the Legislation and Policy Context
The Constitution of South Africa (Act no. 108 of 1996) Section 24	This entire EIR is prepared as part of the Environmental Authorisation application process under NEMA. Refer to Socio Economic Impact Assessment (Appendix N).	The proposed Ergo SEF supports the promotion of economic and social development whilst adhering to all legislation and guidelines that prevent pollution and environmental degradation, promotes conservation, and achieves a sustainable use of natural resources and development.
Environmental Conservation Act (73 of 1989) (ECA)	This entire EIR is prepared as part of the Environmental Authorisation application process under NEMA.	Development of SEFs is governed by Section 31A of ECA, mainly outlining mechanisms limiting detrimental environmental impact through the powers of the Minister, CA, local authority, or government institutions, based on their opinion of such development and associated impacts. An EA is required for the construction of the proposed SEF.
Environmental Impact Assessment Regulations Listing Notice 1 of 2014 (GN 983 as amended in GN. 327) Listing Notice 2 of 2014 (GN 984 as amended in GN. 325) and Listing Notice 3 of 2014 (GN. 985 as amended in GN. 324) of GG 40772. Activity 1 of Listing Notice 2 of 2014 (GN 984 as amended in GN. 325):	This entire EIR is prepared as part of the Environmental Authorisation application process under NEMA.	The proposed Ergo SEF triggers an application for Environmental Authorisation and is subject to a S&EIR Assessment Process in terms of NEMA. GN R. 982: Independent EAP selected to ensure compliance with EIA procedures. GN R. 983, 984 and 985: A finalized document following the EIA process to be submitted to the DMRE.

Applicable Legislation and Guidelines	Reference Where Applied (i.e. where in this document has it been explained how the development complies with and responds to the legislation and policy context)	How does this Development Comply with and Respond to the Legislation and Policy Context
Activities relating to the generation of electricity from a renewable energy source of more than 20MW.		
National Environmental Management Act 107 of 1998 (NEMA) Section 24- Environmental Authorisations	This entire EIR is prepared as part of the Environmental Authorisation application process under NEMA.	The submission of a EIR as in the case of this report to promote sustainable development. This EIR is submitted with an Environmental Management Programme (EMPr)
Minerals and Petroleum Resources Development Act (28 of 2002) (MPRDA)	This entire EIR is prepared as part of the Environmental Authorisation application process on the Department of Mineral Resources and Energy (DMRE).	The proposed Ergo SEF is proposed on land holding mining rights. The electricity generated will be used by the Ergo mining works. Application for Environmental Authorization will be submitted to the DMRE as the competent authority, and GDARD as the commenting authority.
South African National Roads Agency Limited and National Roads Act (7 of 1998)	Mitigation measures relating to the management of traffic impacts are included in Part B: EMPr of this report	The protection and upkeep of national roads. Care should be taken by all involved to refrain from damaging activities.
National Road Traffic Act (93 of 1996)	Mitigation measures relating to the management of traffic impacts are included in Part B: EMPr of this report	All vehicles must be registered according to its intended use and all drivers and vehicles must be fit for hire and usage. GN R. 225 - Should dangerous goods be transported, a dangerous goods inspector must be appointed and appropriate standards maintained
The Infrastructure Development Act (23 of 2014)	Mitigation measures relating to the management of Infrastructure are included in Part B: EMPr of this report	All protocols falling under this Act are to be submitted for application along with an established plan as part of the EIR and the EMPr.

Applicable Legislation and Guidelines	Reference Where Applied (i.e. where in this document has it been explained how the development complies with and responds to the legislation and policy context)	How does this Development Comply with and Respond to the Legislation and Policy Context
National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA) o GN 893: List of activities which result in atmospheric emissions o GN R. 827: National dust control regulations o GN R. 283: National atmospheric emissions reporting regulations o GN R. 1210: National ambient air quality standards	Mitigation measures relating to the management of dust impacts are included in Part B: EMPr of this report	Dust will be monitored at the SEF and will be mitigated accordingly in line with the EMPr.
Atmospheric Pollution Prevention Act (45 of 1965) o GN R. 1651 - Control of noxious or offensive gasses emitted by vehicles	Mitigation measures relating to the management of dust impacts are included in Part B: EMPr of this report	SEF plant vehicles must be monitored and mitigation measures accordingly applied in line with the EMPr.
National Environmental Management: Protected Areas Act (57 of 2003) (NEMPA)	No Protected Areas will be impacted. Refer to Appendix E for Terrestrial Biodiversity Impact Assessment. Refer to Section 3.h.(v). of this EIR.	The SEF will be sustainably constructed to protect and preserve ecologically important areas within South Africa for the conservation of biodiversity.
National Environmental Management: Waste Act (59 of 2008) (NEMWA) o GN R. 634 – classification of waste and plan of waste management o GN R. 632 - Regulations concerning the planning and management of residue stockpiles and deposits from prospecting, mining, exploration or production operation o GN R. 921 - Activities requiring a waste management licence (WML): o GN R. 633 - List of waste management activities that may be detrimental to the ecosystem.	Mitigation measures relating to the management of dust impacts are included in Part B: EMPr of this report	Compliance with the Act for all waste management activities. Construction and operational waste from site must be disposed of in an approved manner in line with the EMPr.

Applicable Legislation and Guidelines	Reference Where Applied (i.e. where in this document has it been explained how the development complies with and responds to the legislation and policy context)	How does this Development Comply with and Respond to the Legislation and Policy Context
o GN R. 625 - National waste information regulations based on those classified in GN R.633. o GN R. 635 - National standards for the assessment of waste for designated landfill disposal. o GN R. 636 - National norms and standards for disposal of waste to landfill. o Describing the general procedure for waste disposal to designated landfill. o GN R. 926 - National norms and standards for management and storage of waste.		
National Water Act (36 of 1998) (NWA)	The EMPr (Part B) of this report provides detail on applicable water uses.	It is noted that the application area falls within a regulated zone. i.e. which is 500m from a wetland, and 100m from a water course or outside the 1:100 year floodline. A Water Use Licence in terms of Water Use will be applied for triggering section 21 a; c and i of NWA.
Mine Health and Safety Act (29 of 1996) o GN R. 1237 - Mines and works regulations o GN R. 911 - Health and safety regulations for mining	Mitigation measures relating to the management of dust impacts are included in Part B: EMPr of this report	The proposed Ergo SEF will be constructed on Ergo owned land, and it's energy will feed into mining works, it is therefore best practice to apply the relevant mining legislation.
Fertilizers, farm feeds, agricultural remedies and stock remedies Act (36 of 1947)	Mitigation measures relating to the management of dust impacts are included in Part B: EMPr of this report	The use of herbicides and pesticides are to be included in the EMPr.
Conservation of Agricultural Resources Act (43 of 1983) (CARA) o GN R. 1048 – Declaration of weeds and invasive plant species.	No agricultural loss is anticipated. (Refer to Appendix J (Soils land capability and Agricultural potential Impact Assessment), and Section 3.h.(v) of this EIR.	Removal of invasive alien species i.e., Declare category 1, 2 or 3 as dictated by its national classification, and focus on the conservation of fertile soils for cultivation.

Applicable Legislation and Guidelines	Reference Where Applied (i.e. where in this document has it been explained how the development complies with and responds to the legislation and policy context)	How does this Development Comply with and Respond to the Legislation and Policy Context
National Environmental Management: Biodiversity Act (10 of 2002) (NEMBA) Section 57 and 87. o GN R. 151 - Publication of lists of species that are threatened or protected, activities that are prohibited and exemption from restriction. o GN R. 152 - Threatened or Protected Species Regulations. o GN R. 1003 - Alien and Invasive Species Lists. o GN R. 1020 - Alien and Invasive Species Regulations.	Regulations published under NEMBA provides a list of protected flora and fauna species, according to NEMBA (GN R. 151 dated 23 February 2007, as amended in GN R. 1187 dated 14 December 2007) a protected species require a permit in order to be disturbed or destroyed.	The proposed SEF triggers the management and conservation of South Africa's biodiversity within the framework of NEMA. Site visits were carried out by fauna and flora specialists to determine the presence, absence and abundance of plant and animal species and the action that should be taken according to the findings of the studies and the associated legislation.
National Veld and Forest Fire Act (101 of 1998)	Part B EMPr	Regulations prevent fires should be incorporated in the EMPr.
National Forest Act (84 of 1998) (NFA)	Refer to Flora Terrestrial Biodiversity Impact Assessment (Appendix E).	Department of Forestry, Fisheries and the Environment (DFFE) permit will be required to remove, cut or destroy any protected tree species should any be identified within the application area. The site is heavily transformed and was assessed by a vegetation specialist. Measures are to be put in place to protect any remaining natural forests and protected tree species. No species of conservation concern was however found on the proposed site.
National Heritage Resources Act (25 of 1999) (NHRA)	Section 3h describes of the cultural and heritage landscape. Refer to Appendix K (Heritage Impact Assessment Report).	A heritage specialist (covering Archaeological and Palaeontological) was appointed to survey the proposed site. Impact of the proposed project on heritage resources is low and any impact to accidental finds can be mitigated.
Occupational Health and Safety Act (85 of 1993) o GN R.1248	Mitigation measures relating to the management of health and safety impacts are included Part B: EMPr of this report	To ensure the health and safety of all parties throughout the life of the proposed SEF through the general duties of employers and employees.

Applicable Legislation and Guidelines	Reference Where Applied (i.e. where in this document has it been explained how the development complies with and responds to the legislation and policy context)	How does this Development Comply with and Respond to the Legislation and Policy Context
Hazardous Substances Act (15 of 1973)	Mitigation measures relating to the management of hazardous substances are included Part B: EMPr of this report.	Requirements to be incorporated into EMPr and the Ergo mine Health and Safety management plan.
SANS 10103 (Noise Regulations)	Mitigation measures relating to the management of noise impacts are included Part B: EMPr of this report. Refer to Appendix P for specialist opinion.	Noise generated from the proposed PV plan (i.e. from transformers, and substations) are minimal, and therefore do not need a noise study as advised by a Noise specialist.
Gauteng Nature Conservation Ordinance 12 of 1983, as amended by Gauteng General Law Amendment Act 4 of 2005	Refer to Section 3.h. and the Flora Terrestrial Biodiversity Impact Assessment (Appendix E).	Regulates nature conservation on a provincial level.
Gauteng Transport Infrastructure Act (8 of 2001) o GN R. 219 - Gauteng Transport Infrastructure Regulations.	Refer to Appendix O for the Traffic Impact Assessment.	Regulates provincial roads.

f. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the referred location)

Tshedza 3 Investments (Pty) Ltd proposes to construct a PV facility capable of generating up to 40 MW on an earmarked development footprint in close proximity to the Ergo mining operations and the Brakpan/Withok Tailings Dam facility, as assessed through this S&EIR process. The aim of the proposed project is to add onto the approved Phase 1 project (19.9 MW PV as approved, substation, 100MWh battery energy storage system (BESS), and 11km of 22kV overhead powerlines) to generate up to 59.9MW of energy in total to sustainably supply the existing Ergo Mining Brakpan Plant and the Brakpan/Withok Tailings Dam facility with clean and stable electricity during grid curtailments and outages through embedded generation. It is intended that excess energy produced by the SEF will be fed back into the grid. The mine can therefore contribute toward alleviating the current pressure on the Eskom grid through the construction of the proposed SEFs.1

The need and desirability of the proposed SEF is two-fold. The mine firstly needs a stable supply of energy to sustainably meet its electricity consumption demands through the proposal of generating clean energy, and secondly, by generating its own power, the mine can alleviate the current pressure on the Eskom grid.

The National Development Plan 2030 (NDP), implemented in 2013, identifies the need for various sectors to invest in a network of infrastructure that will support the country's medium- and long-term economic and social objectives (https://ipp-projects.co.za). Not surprisingly, energy infrastructure is a critical component of the NDP. Energy infrastructure plays an important role in fortifying economic activity and growth across the country and therefore the development of this infrastructure needs to be robust and extensive enough to meet industrial, commercial and household needs. South Africa's Renewable Energy potential is significant and together with a national commitment to transition to a low carbon economy, 26 030MW of the 2019 Integrated Resources Plan (IRP) target of newly generated power is expected to be from renewable energy sources (https://ipp-projects.co.za). The Renewable Energy Independent Power Producer (REIPP) Procurement Programme was established to stimulate the renewable industry by contributing to the 26 030MW target and to ensure socio-economic and environmentally sustainable growth within South Africa.

In order to demonstrate commitment to sustainable development and a pledge to move towards a cleaner energy future, Tshedza 3 Investments (Pty) Ltd proposes to construct a SEF in a phased approach to supply power to the existing Ergo Mining (Pty) Ltd Brakpan Plant and the Brakpan/Withok Tailings Facility. The identified site is centrally situated on Ergo Mining owned land between the Brakpan Plant and the Brakpan/Withok Tailings Facility within the City of Ekurhuleni Metropolitan Municipality, Gauteng Province. To date, renewable energy sources have been under-utilised within the Ekurhuleni Municipality and as a result, the Energy and Climate Change Strategy (ECCS) set a target of 10% of all energy used in Ekurhuleni to be supplied by clean energy resources by 2020. The two mining facilities i.e., Ergo Mining Brakpan Plant and the Brakpan/Withok Tailings Dam facility, are currently supplied with electricity by Eskom via the existing grid infrastructure. The proposed SEF will generate electricity (up to 40MW- also referred to as Phase 2) and integrate with the Phase 1 (up to 19.9MW as assessed and approved through a separate Basic Assessment Process) of the project to utilise a 100MWh battery energy storage system. Phase 1 (19.9MW) and Phase 2 (40MW) will integrate with the existing Eskom grid to supply up to 59.9MW

to the Ergo Mining Brakpan Plant and the Brakpan/Withok Tailings Facility. The generated electricity can be utilised to supplement the Eskom supply, and when there is an interruption to Eskom's supply in energy.

There is an abundance of flat terrain and high irradiation at the proposed site, making it an ideal site for a PV facility. The proposed SEF will be in line with the country's national commitment to a low carbon economy, through a 'just transition' from coal to Renewable Energy. Cleaner energy is necessary to meet Paris Agreement goals to contribute to a reduced carbon footprint for South Africa as well as on a global level. Favourable conditions allow for an untapped abundance of solar resources to be exploited, allowing for the generation of electricity to the Ergo mining works with the potential to supply surplus power to neighbouring mines.

The proposed SEF can also contribute towards the mine rehabilitation plan by utilising already disturbed mining land for the generation of renewable energy and in support toward a just energy transition to counter energy production of existing coal fired powered stations.

Energy Security

The short to medium-term goal of the project is to obtain a secure energy supply for Ergo Mining to ensure operational capacity during grid supply curtailment and interruptions. Current operations are impacted by the ongoing load shedding and interruptions from Eskom. This is assumed to affect mining production, which could have broader implications for the business. Low or inconsistent production could result in lower output and other risks, such as damage to equipment (due to unscheduled shutdowns) and potentially large-scale issues that could lead to the closure of the facility.

The Ergo Plant has been in operation since 1977 (although closed between 2005 and 2007) and has a 25.2 Mt annual capacity. The mine currently has many employees at the plant and associated facilities. Hindered performance could result in loss of jobs and impact service providers and could potentially result in other losses in the supply chain on a local and regional scale. In addition, the broader economic revenue generated by the business could be affected, resulting in regional socio- economic impacts. The mine therefore must prioritise securing its own electricity in line with its energy requirements to reach its long-term operational goals.

Use of Renewable Energy and reduction in Greenhouse Gas Emissions

The proposed use of alternative power for securing energy for the Ergo plant will first reduce the load on the Eskom grid to supply the region, and thus open up supply for other sectors that may require it. The selection of solar PV technology provides an opportunity for Ergo Mining to reduce its carbon footprint and potentially move towards meeting investment requirements in terms of integrated sustainability and environmental, social and governance targets.

The proposed phase 2 of the solar PV project, will add an additional 40MW of PV capacity to the currently approved Phase 1 (19.9MW) totalling an anticipated 59.9MW of energy production for the mining plant. This will enable Ergo Mining to supply energy back into the main grid and assist with meeting national requirements for a move towards renewable energy on a national level under the Integrated Resource Plan (IRP). The IRP and related strategies and initiatives provide broader socio-economic benefits in terms of reduced reliance on finite resources, reduced carbon and greenhouse gas emissions, and promotion of equity and equality.

Ergo's efforts in promoting renewable energy and energy efficiency projects contribute to the United Nations' (UN) Sustainable Development Goal (SDG) SDG 7 *(Ensure access to affordable, reliable, sustainable and modern energy for all*) and SDG 13 *(Take urgent action to combat climate change and its impacts)* and help drive South Africa towards carbon neutrality in the fight against the global climate crisis. Carbon neutrality refers to achieving net zero carbon dioxide emissions by balancing carbon output through promoting carbon offsets. Renewable energy is seen as a carbon offset, and the proposed SEF will replace energy resources that would normally generate carbon emissions.

Strategic Infrastructure Projects (SIP) projects

The proposed Ergo SEF is in line with the Infrastructure Development Act (Act 23 of 2014) which prompts infrastructure investment in South Africa while unlocking the Energy SIPs i.e., SIP 8 (Green Energy in support of the South African economy), SIP 9 (Electricity generation to support socio-economic development) and SIP 10 (Electricity transmission and distribution, thus playing a critical role in the South African economy inclusive of economic growth and employment creation, while assisting in stabilising national energy efficiencies.

SIP 8: Green energy in support of the South African economy Support sustainable green energy initiatives on a national scale through a diverse range of clean energy options as envisaged in the Integrated Resource Plan (IRP2010) and support bio-fuel production facilities. *The proposed SEF will have the capacity to generate and deliver up to 40MW of electricity to mining works in surrounding areas.*
SIP 9: Electricity generation to support socioeconomic development Accelerate the construction of new electricity generation capacity in accordance with the IRP2010 to meet the needs of the economy and address historical imbalances. Monitor implementation of major projects such as new power stations: Medupi, Kusile and Ingula. *The proposed PV facility will have the capacity to generate and deliver up to 40MW of electricity to mining works in surrounding areas.*
SIP 10: Electricity transmission and distribution for all Expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity. *Ancillary infrastructure (assessed through a Basic Assessment for phase 1) includes up to 11km of 22kV overhead power line to link the proposed SEF to existing substations which tie into the Eskom Grid.*

Long after the COVID-19 pandemic abates, the global warming issue will remain a world priority which will continue to hinder the delivery of electricity by ESKOM. The following points are also important to note in emphasising the need for the proposed 40MW SEF:

1) ESKOM is the state-owned power generator in SA - with 15 coal fired power stations (including newly build Medupi and Kusile) with an installed capacity of 45GW. It has 1 nuclear station (Koeberg) with a capacity of 1.9GW. These power stations currently provide around 95% of SA's electricity requirements.
2) ESKOM must de-commission up to 17.5GW of old coal fired power stations that are at, or nearing the end of life (including Hendrina, Camden, Grootvlei, Komati). New coal-based power stations will not replace them and instead, the focus is on an energy transition.
3) ESKOM cannot currently meet SA's energy requirements, and its average energy availability factor is down to 60%. This issue manifests in unpredictable power outages - known as load shedding - to maintain grid stability and match demand with supply.
4) Government has moved towards energy liberalization in the 2019 energy policy roadmap known as the Integrated Resource Plan 2019 (IRP), which sets out SA's energy mix until 2030. The IRP stipulates the sources from which SA may derive new energy.

The IRP is the overarching Energy Plan of SA and authorises new-builds comprising 14.6 GW of utility scale wind, 6 GW of utility-scale solar photovoltaic (PV), and about 5 GW of distributed self-generation by energy consumers, augmented by 3 GW of gas/diesel-fired power and 2 GW of battery storage.

Policies and interventions to streamline EIA process for Renewable Energy Projects

In line with the requirements set by the National Development Plan - Vision for 2030 to ensure coordination and simplification of the authorisation/licensing processes related to developments the DFFE have implemented a number of interventions to streamline environmental authorisations related to renewable energy projects since 2014, highlighting the need for the implementation of operational Renewable Energy projects in South Africa. Interventions include:

- Review of the Environmental Impact Assessment Process to remove several administrative steps and reduce timeframes
- The identification and gazetting of 11 Renewable Development Zones (REDZ); 5 electricity transmission corridors and gas corridors in which the environmental authorisation timeframes have been halved
- The implementation of a Generic Environmental Management Programmes for grid and substation development and expansion which replaces the specific site environmental management plan which will reduce the time and cost
- Reducing of review and decision-making timeframes for Strategic Integrated Projects

It is however noted that while these initiatives have been well received an environmental authorisation is still required. Additional interventions have been identified which include exclusions from the need to obtain an environmental authorization:

- Exclusion of powerlines and substations from the EA when developed within areas of low and medium sensitivity
- Strategic electricity corridors (gazetted in February 2018)

Planned exclusion of Solar PV facilities from an EA based on compliance with the web-based screening tool (Gazette subject to public comment (August 2022))

- Based on the adopted environmental management instrument, Solar PV facilities, as well as the associated infrastructure, are to be excluded from the need to obtain an environmental authorisation prior to commencement when developed in areas confirmed to be of "medium" and "low" sensitivity.
- Timelines will be drastically reduced for sites that fall within low to medium sensitivity based on the outcome of the DFFE screening tool. It is noted that this will be a registration process as opposed to a full assessment process, impacting accordingly:
  - A 60 day registration process as opposed to a 300 day EIA process
  - A 60 day registration process as opposed to a 147 day Basic Assessment process
- Solar PV site registration will need to be undertaken by an independent Environmental Assessment Practitioner, and sites need to be ground truthed with specialist input as required. A site verification report will be required.
- This instrument will supersede other tools, i.e. SIPs (Strategic Integrated Projects), REDZ (Renewable Energy Development Zones) etc. should it be passed.

g. MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE

The proposed site is centrally situated between the Brakpan Plant and the Brakpan/Withok Tailings Facility where the power from the proposed SEF will be utilised. These two mining facilities are currently supplied with electricity by Eskom via the existing grid infrastructure. The ERGO Plant is currently fed from 88kV primary (Springs Industries and Snowdown) to 6.6 kV supply on the secondary side of the ESKOM substation. The Brakpan Tailings Dam facility is fed from a 10 MVA 88 kV primary to 11 kV supply on the secondary side of the ESKOM substation. The proposed Ergo SEF will generate electricity with battery storage (from the approved Phase 1), to integrate with the existing Eskom grid to supply the Ergo Mining Brakpan Plant and the Brakpan/Withok Tailings Facility. The proposed centralized PV system shall interface and tie into the 6.6 kV network to connect into the ESKOM network but prohibit feedback while generating electricity when the site is being fed from the generator and energy storage system during grid curtailment and outages.

Much of the proposed development footprint was historically disturbed (mostly through mining and related activities, but also crop agriculture), as evidenced in historical Google Earth imagery. All earmarked land for the PV facility is currently vacant and owned by Ergo Mining and mostly falls within the existing approved Mining Right Area. Farm Witpoortje 117 IR Portion 183 and Farm Withok 131 IR Portion 9 was historically impacted on by mining activities and Farm Witpoortje 117 IR Portion 272 was previously cultivated. These properties are currently zoned as mining and agricultural, and the portions necessary for the proposed SEF will be rezoned to special use for a Renewable Energy Facility.

There is an abundance of flat terrain and high irradiation at the proposed site, making it an ideal site for a PV facility. The proposed Ergo SEF will be in line with the country's national commitment to a low carbon economy, through a 'just transition' from coal to Renewable Energy. Cleaner energy is necessary to meet Paris Agreement goals to contribute to a reduced carbon footprint for South Africa as well as on a global level. Favourable conditions allow for an untapped abundance of solar resources to be exploited, allowing for the generation of electricity to the Ergo mining works with the potential to supply surplus power to neighbouring mines.

The proposed Ergo SEF can also contribute towards the mine rehabilitation plan by utilising already disturbed mining land for the generation of renewable energy and in support toward a just energy transition to counter energy production of existing coal fired powered stations.

h. DESCRIPTION OF PROCESS FOLOWED TO REACH DEVELOPMENT FOOTPRINT

(Full description of the process followed to reach the proposed development footprint within the approved site. NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.)

Alternatives are defined in the Regulations as "different means of meeting the general purpose and requirements of the activity". In terms of the NEMA EIA Regulations (2014 as amended) alternatives must be assessed and evaluated by the EAP at a scale and level that enables adequate comparison with the proposed development. The EAP must provide opportunities for stakeholder input in terms of the identification and evaluation of alternatives. When considering alternatives, the criterion to be taken into account is "any feasible and reasonable alternatives to the activity and any feasible and reasonable modifications or changes to the activity that may minimise harm to the environment".

i.Details of the development footprint alternatives considered

a) Property

The identified site is currently vacant, and the development is proposed on a portion of land that was previously two gold mine tailings facilities with a small portion on degraded natural areas. Portions of the land has been re-mined, and most of the site subsequently rehabilitated to its current naturally vegetated condition which now comprises mostly disturbed grassland. The properties are currently zoned as mining and agriculture, and a consent use application will be applied for in planning to accommodate the renewable energy structures. The properties are entirely owned by ERGO Mining Limited, falling within the existing approved Mining Right Area.

The proposed site is centrally situated between the Brakpan Plant and the Brakpan/Withok Tailings Facility. These two mining facilities are currently supplied with electricity by Eskom via the existing grid infrastructure. The ERGO Plant is currently fed from 88kV primary (Springs Industries and Snowdown) to 6.6 kV supply on the secondary side of the ESKOM substation. The Brakpan Tailings Dam facility is fed from a 10 MVA 88 kV primary to 11 kV supply on the secondary side of the ESKOM substation. The proposed SEF will generate electricity and tie into the approved battery storage system of Phase 1, to integrate with the existing Eskom grid to supply the Ergo Mining Brakpan Plant and the Brakpan/Withok Tailings Facility. The proposed centralized PV system shall interface and tie into the 6.6 kV network to connect into the ESKOM network but prohibit feedback while generating electricity when the site is being fed from the generator and energy storage system during grid curtailment and outages.

A large area of 557ha has been scoped as part of the scoping phase by the EAP and appointed specialists. The proposed footprints and sensitive areas as highlighted as part of the scoping assessment was ground-truthed for the Impact Assessment phase to verify sensitivities. The proposed 40MW PV facility requires a total area of ~120ha of land within the area scoped. Property alternatives were considered (Refer to Figure 9):

Preferred Layout Area

- Farm Witpoortje 117 IR Portion 183 (Referred to as Area A1) and
- Farm Witpoortje 117 IR Portion 272 (Referred to as Area B)

Alternate Layout Area

- Farm Witpoortje 117 IR Portion 183 (Referred to as Area A1) and
- Farm Withok 131 IR Portion 9.

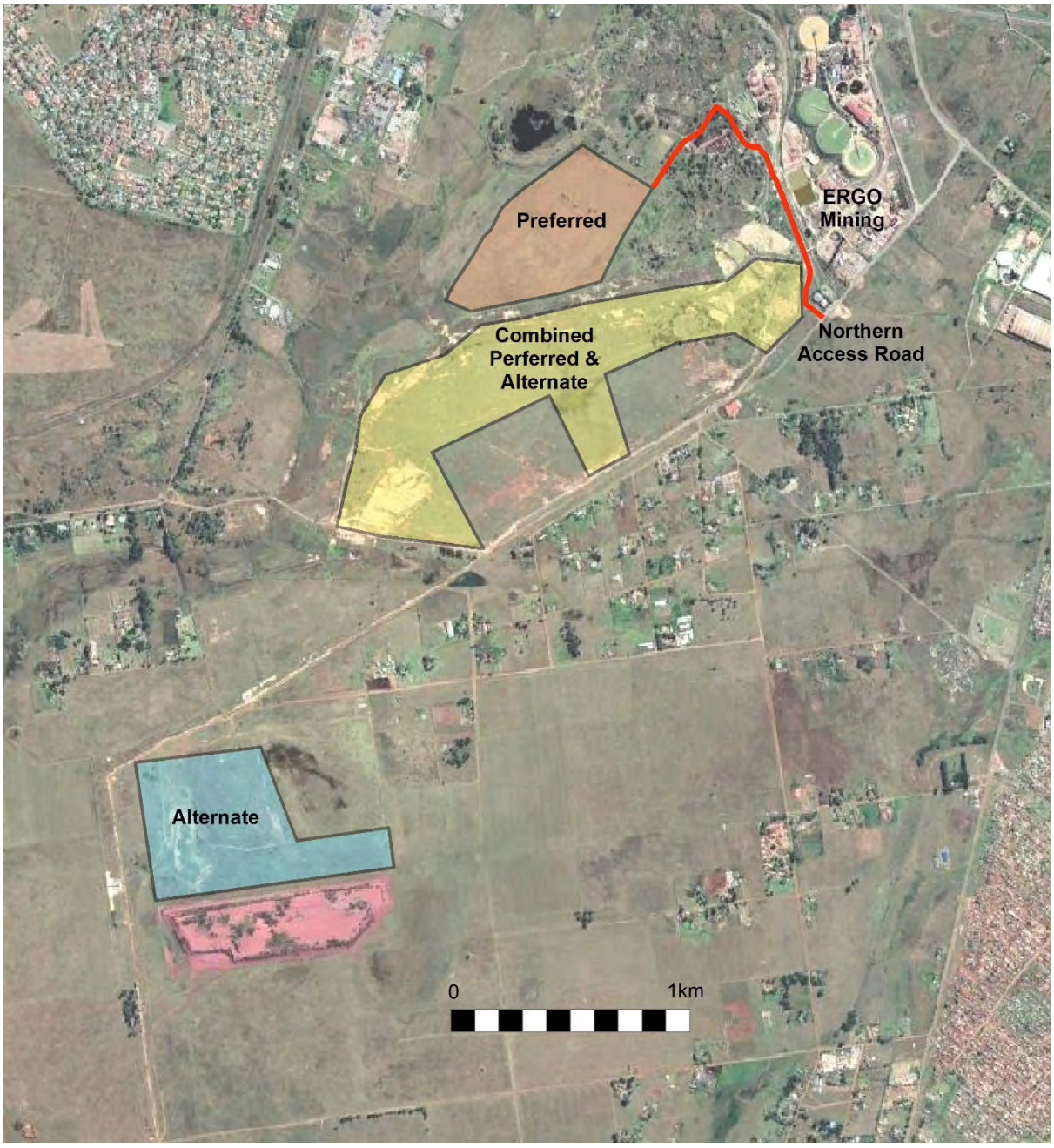


Figure 9: Property alternatives considered through this S&EIR

b) Type of Activity

The development of a renewable energy power producing facility, a PV facility in particular is assessed through this EIR. No activity alternatives have being considered in this S&EIR Process.

c) Design or Layout of the activity

The proposed photovoltaic layout is dictated by solar irradiance economics and the proposed layout is designed for most economic energy "capture" per square meter. The layout is therefore designed to ensure highest energy "capturing" over the smallest area. Layout alternatives have been considered in this EIR.

Three land portions have been considered for the proposed Phase 2 SEF facility. A site visit for the Layout alternatives has been undertaken by specialists to ground truth and verify site sensitivities in the impact assessment phase. A preferred layout for the establishment of the proposed Phase 2 SEF facility (based on the avoidance of site sensitives) has been identified, followed by a detailed assessment by the EIA team of the primary data collected during the site survey of the proposed 40MW SEF development envelope.

The preferred layout was optimised based on the homogenous and disturbed nature of the sites and was selected from a technical and feasibility aspect for the mine. The preferred layout does not traverse sensitive biodiversity areas in comparison to the layout alternative.

- ~120 ha (Preferred Alternative)
- ~122ha (Layout alternative)

d) Technology Alternatives

There are a few renewable energy technologies, of which the most common around the world are wind, solar (concentrated solar power (CSP) plants and photovoltaic (PV) power plants), hydro and geothermal. The City of Ekurhuleni has released a statement that "the department has identified Solar PV as the best available technology to invest in, in terms of renewable energy to augment the current status of increasing energy demand"[8] toward the target set by the Climate Change Strategy (as approved in September 2017) for there to be 25% clean energy mix and energy efficiency by 2030. On the energy supply side, studies were done to determine the most sustainable replacement of certain energy sources for transport, residential, commercial and industrial uses. Solar formed a critical part of the strategy to replace the energy supply and form a cleaner energy mix. The potentials for hydro and wind power in Gauteng is low, and not feasible and therefore the renewable energy replacement test concluded on solar. A PV solar energy facility is therefore proposed to supply power to the Ergo mining works and tailings facility.

No further alternatives in terms of the technology to be used have been considered during the EIA process

e) Operational Aspects

No operational alternatives were considered during this EIA process.

f) Option of Not Implementing the Activity

Should the Ergo SEF not receive an Environmental Authorisation, the Ergo mining works will continue to suffer operational losses, entailing job and economic losses as a negative impact on the socio-economic scale on

3) [8] City of Ekurhuleni, 3 July 2020, "Renewable Energy is a Cost Effective Solution for the City" available at https://www.ekurhuleni.gov.za/component/content/article/48-press-releases/service-delivery/5395-renewable-energy-is-a-cost-effective-solution-for-the-city.html (Accessed 1 July 2021).

regional and national levels. The IDP objective for green energy, as well as the loss of economic investment into the area will also be lost.

ii. Details of the Public Participation Process Followed

(Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.)

An extensive public participation process has been undertaken to date by EnviroRoots (Pty) Ltd (Refer to Appendix D for the detailed Public participation specialist report).

a) Identification of I&APs

The following groups were identified as potential Interested and Affected Parties (I&APs) by the public participation specialist:

- Relevant Government Departments;
- Relevant Municipal Representatives, including Ward Councillors;
- Landowners/Occupiers;
- Adjacent Landowners/Occupiers;
- Community Institutions and members;
- Relevant Institutional/Organisational Representatives;
- Land Claimants; and
- Governmental and Non-Governmental Organisations and Agencies.

To ensure that all potential I&APs were made aware of the project and had the opportunity to register and provide comments, the notification process was as thorough as possible. Registration ~~will remain~~ has remained open throughout the Public Participation Process to allow I&APs to register and submit their input throughout. For the list of identified I&APs refer to Appendix 1 of Appendix D.

b) Notification of I&APs

- Site Notices

To inform surrounding and immediate community members, landowners, occupiers, workers and passers-by of the proposed project and to invite registrations and comments, four (4) A2 notices were erected at visible and accessible localities throughout the study area on 27 November 2021. These notices were strategically erected along access routes throughout the study area and are summarised in Table 8 below. Photographic evidence of

the site notices erected is attached as Appendix 2 of Appendix D. All I&APs who registered in response to the site notices placed, were directly informed of the correction of the applicant's name for the purpose of the application process on 06 January 2022 via their preferred method of communication.

Table 8: Locality of Site Notices Placed

Date	Number	Coordinates	Placement
27/11/2021	Site Notice 01	26°16'57.41"S 28°22'39.43"E	Entrance Road to Ergo Plant
27/11/2021	Site Notice 02	26°17'28.98"S 28°22'5.71"E	Corner of 10th Street and Reid Street at access to Withok Estates Agricultural Holdings
27/11/2021	Site Notice 03	26°19'1.96"S 28°21'1.77"E	Lukas Steyn Street near properties earmarked for development
27/11/2021	Site Notice 04	26°17'58.61"S 28°20'51.85"E	Corner of Floors Street and 18th Street at access to Withok Estates Agricultural Holdings

- Newspaper Advertisements

To inform a broad spectrum of individuals who might want to register as I&APs, a newspaper advertisement was placed in the Brakpan Herald newspaper on Friday, 26 November 2021 (Page 14). For proof of the advertisement placed, refer to Appendix 3 of Appendix D. All I&APs who registered in response to the advertisement placed, were directly informed of the correction of the applicant's name for the purpose of the application process on 06 January 2022 via their preferred method of communication.

- Written Notifications

Identified I&APs were directly informed of the application processes to be followed by means of email, hand delivery, registered post, social media and text messages. Proof of written notifications sent is provided in the relevant appendices as described in the Public Participation report (Appendix D). Note that the written notifications encouraged potential I&APs to register and provide their comments/questions on the proposed project and related application processes currently underway. Written notifications of the availability of the Draft documentation for Public Commenting discussed in Section 6 Public Participation report (Appendix D).

- Email Notifications

I&APs were notified of the proposed project by means of email on 25 & 29 November 2021 and 01 & 02 December 2021. The Background Information Document (BID) was attached to the emails and all email notifications sent provided the contact information for EnviroRoots (Pty) Ltd. Refer to Appendix 4 of Appendix D for the BID. Proof of written notifications sent via email is attached to Appendix D – Appendix 5. An erratum email notification was sent on 06 January 2022 and 10 January 2022 to correct the applicant's name which was initially reflected incorrectly.

- Hand Delivery

BIDs providing information on the proposed project, were physically hand delivered on 06 December 2021. The acknowledgements of receipt of hand delivered notifications is attached to the Public Participation report as Appendix 6. Further to the above, BIDs were placed at the gates of adjacent landowners and at post boxes of known physical addresses on 06 December 2021 where it could not be electronically delivered. BIDs were in addition couriered where applicable on 29 November 2021 and 09 December 2021. Photographic evidence of BIDs placed at residences and for proof of couriered BIDs is included in Appendix 6 of Appendix D. All I&APs who registered in response to the hand delivered notifications, were directly informed of the correction of the applicant's name for the purpose of the application process on 06 January 2022 via their preferred method of communication.

- Registered Post

Where I&APs could not be provided with the BID either electronically or by hand delivery, and postal addresses were available, the BID was sent via Registered Post on 27 November 2021 and 11 December 2021. Proof of Registered Post sent is attached to the Public Participation report in Appendix 7 of Appendix D. All I&APs who registered in response to the hand delivered notifications, were directly informed of the correction of the applicant's name for the purpose of the application process on 06 January 2022 via their preferred method of communication.

- Text Message

I&APs were notified by means of text message (SMS) where mobile numbers were available, and no other means of notification was possible. Refer to Appendix 9 of Appendix D for proof of SMS notifications sent on 25 November 2021 and 02 December 2021. The SMS notification highlighted the intention to lodge an application for Environmental Authorisation by means of a Scoping and EIA Process and an application for a Water Use License and indicated an invitation to register/comment as part of the Environmental Process. An erratum email notification was sent on 06 January 2022 to correct the applicant's name which was reflected incorrectly.

- Social Media

A notification was sent to the New Life Church situated on Portion 3 of the Farm Withok 131 IR via their Facebook page on 07 December 2021 as no other communication methods were possible at the time. The notification to the email address failed and at the time there was no answer at the available mobile number. For proof of the Facebook notification sent refer to Appendix 8 of Appendix D. An erratum email notification was sent on 06 January 2022 to correct the applicant's name which was initially reflected incorrectly.

c) Public Meetings

INTRODUCTION TO PHASE 2 PROJECT DURING PHASE 1 MEETINGS

The Ergo PV Phase 2 Project was introduced during the Public Participation Meeting and the Focus Group Meeting for the Phase 1 Project held on 28 October 2021 @ 10h00 am and @ 18h00 pm respectively. Refer to APPENDIX 10 of PPP report (Appendix D) for the summaries of comments received during the above-mentioned meetings.

PHASE 2 PROJECT PUBLIC PARTICIPATION MEETING

A Public Participation Meeting was held on 30 March 2022 @ 10h00 am to discuss the Tshedza 3 Investments (Pty) Ltd: Proposed construction of a Solar Photovoltaic (PV) Plant to generate up to 40 MW of energy. Refer to Appendix 11 of PPP report (Appendix D) for a summary of comments received during the meeting.

No request for a public meeting was made during the Public review period of the Draft EIA process.

d) Notification Of I&APs of Reports Availability

Registered I&APs were notified of the availability of the Draft Scoping Report (DSR) for Public Commenting on 23 March 2022 and 28 March 2022 by means of email, hand delivery and text message. I&APs were informed of the relevant commenting period and were encouraged to submit any comments or questions on or before the relevant closing date (25 April 2022). A hard copy of the draft document was hand delivered to the Department of Mineral Resources and Energy (DMRE) whereas hard copies were placed at the Brakpan Library and the Tsakane Customer Care Centre for Public Viewing. Further to this, electronic copies of the draft document were uploaded onto the Environmental Management Assistance (Pty) Ltd Website for easy access. Refer to Appendix 12 of PPP report (Appendix D) for the notifications to I&APs of the report availability.

Registered I&APs were furthermore notified of the availability of the Draft Environmental Impact Assessment (EIA) Report for Public Commenting on 11 & 13 September 2022 by means of email, hand delivery, text message and social media. I&APs were informed of the relevant commenting period and were encouraged to submit any comments or questions on or before the relevant closing date (12 October 2022). A hard copy of the draft document was hand delivered to the Department of Mineral Resources and Energy (DMRE) whereas hard copies were placed at the Brakpan Library and the Tsakane Customer Care Centre for Public Viewing. Further to this, an electronic copy of the draft document was uploaded onto the Environmental Management Assistance (Pty) Ltd Website for easy access. Refer to APPENDIX 13 (Appendix D) for the notifications to I&APs of the report availability.

e) Access and Commenting Opportunity

- Registration and Commenting

Commenting and Registration have been provided for throughout this Public Participation Process. The Draft Scoping Report, Draft EIA Report and Draft Water Use License Application (WULA) commenting periods have been preceded by a thorough notification process to allow I&APs to familiarise themselves with the proposed

project prior to making the Draft SR, Draft EIA Report and Draft WULA available for public commenting. The entire process will remain transparent and allow for I&APs to register and comment throughout.

- Draft Scoping Report

A 30-day commenting period has been provided for as part of the Draft Scoping Report phase of this Public Participation Process. This has been conducted in accordance with Clause 3(8) of the NEMA EIA Regulations (GN No. 326 of 07 April 2017) which indicate that any public participation process must be conducted for a period of at least 30 days. However, note that the entire process will remain transparent and allow for I&APs to register and comment throughout. The local communities were taken into consideration by placing hard copies of the relevant documents for Public Commenting at the Brakpan Library and the Tsakane Customer Care Centre. Furthermore, an electronic copy of the draft document was uploaded onto the Environmental Management Assistance (Pty) Ltd Website for easy access to the documents for public commenting.

- Draft EIA Report

A 30-day commenting period has been provided for as part of the Draft EIA Report phase of this Public Participation Process. This has been conducted in accordance with Clause 3(8) of the NEMA EIA Regulations (GN No. 326 of 07 April 2017) which indicate that any public participation process must be conducted for a period of at least 30 days. However, note that the entire process will remain transparent and allow for I&APs to register and comment throughout. The local communities were taken into consideration by placing hard copies of the relevant documents for Public Commenting at the Brakpan Library and the Tsakane Customer Care Centre. Furthermore, as mentioned earlier in this report an electronic copy of the draft document was uploaded onto the Environmental Management Assistance (Pty) Ltd Website for easy access to the documents for public commenting.

f) Regulatory Consultation

All Departments and State-Owned Entities listed in the I&AP Register (Appendix 1 of the PPP report- Appendix D) have been and will continue to be included in the Public Participation Process. However, direct consultations will be conducted with the Regulatory Authorities relevant to this Public Participation Process. Refer to Table 9 below for Regulatory Consultations relevant to this public participation process.

Table 9: Regulatory Consultations

Entity	Communications Description
Department of Mineral Resources and Energy (DMRE)	A pre-application consultation meeting has been held with the Department of Mineral Resources and Energy (DMRE) to present and discuss the proposed project and the way forward for the application processes. The minutes of the meeting is attached to this

Entity	Communications Description
	report as Appendix 13 (Appendix D). Also attached under Appendix 14. (Appendix D) is the Scoping Report Acceptance Letter received from DMRE.
Department of Agriculture, Land Reform and Rural Development (DALRRD)	A formal request for the land claim status of all properties earmarked for development has been submitted to the Department of Agriculture, Land Reform and Rural Development (DALRRD) to which a response has been received. Refer to Appendix 15 (Appendix D) for communications with the DALRRD. It is important to note that the Department of Rural Development and Land Reform is not mandated to disclose any claimant's information to a third party as per the Protection of Personal Information Act, 2013 (Act No. 4 of 2013). Since the claimants lodge their claims against the state only the Commission on Restitution of Land Rights, not the claimants, may be included as an Interested and Affected Party.
Department of Water and Sanitation (DWS)	Following the project notification sent to the Department of Water and Sanitation (DWS), comments were received from DWS regarding rehabilitation of the project site. An invitation to attend the next catchment forum meeting to highlight the proposed project was furthermore extended. Refer to Appendix 16. (Appendix D) for communication with DWS.
Department of Forestry, Fisheries and the Environment (DFFE)	The DFFE Directorate: Biodiversity Conservation acknowledged receipt of the invitation to comment on the Draft Scoping Report and allocated the project to a DFFE official. Refer to Appendix 17 (Appendix D) for communications from the DFFE.
Ward Councillors & Municipalities	The Ward Councillors for Ward 82, Ward 74 and Ward 99 as well as an extensive list of contacts from the Ekurhuleni Metropolitan Municipality were informed of the proposed project. Referrals for the correct Municipal contacts who should be informed of the proposed project were received (all of whom were provided opportunity to comment on the draft documentation). Other than the above, apologies were received for not being able to attend the Public Participation Meeting and a request for a hard copy/flash drive of the draft documents. The Ekurhuleni Environmental Resource & Waste Management Department has furthermore provided formal comments on the DSR. Refer to Appendix 18 (Appendix D) for municipal communications.
South African Heritage Resources Agency (SAHRA)	SAHRA has provided an Interim Comment indicating the requirement for field-based Archaeological Impact Assessment and a Desktop Palaeontological Study which has subsequently been completed. Refer to Appendix 19 (Appendix D) for SAHRA communications.

Entity	Communications Description
Gauteng Department of Roads and Transport (GAUTRANS)	Formal comments were received from GAUTRANS to indicate no objection to the proposed access route. Refer to APPENDIX 20 (Appendix D) for GAUTRANS communications.

g) Disclosure of I&APs' Interests

Registered I&APs have been informed that this process is a public process. All comments and/or questions received from I&APs on this process is considered public knowledge. In accordance with the Environmental Impact Assessment Regulations, EnviroRoots (Pty) Ltd (the public participation specialist) will not keep any information of this nature confidential and will submit all comments and/or questions received to the Regulatory Authority in a verbatim manner.

This Public Participation Process is conducted in accordance with Section 11(1)(c) of the Protection of Personal Information Act, 2013 (Act No. 4 of 2013), which allows for the processing of personal information if processing complies with an obligation imposed by law on the responsible party and in accordance with Section 11(1)(f) of the Act which allows for the processing of personal information if processing is necessary for pursuing the legitimate interests of the responsible party or of a third party to whom the information is supplied.

h) Registrations and Comments Received

Identified I&APs were encouraged to submit their registrations and comments to EnviroRoots (Pty) Ltd, via any of the avenues provided for, for them to receive further correspondence regarding the Ergo Mining Solar (PV) Energy Phase 2 project currently underway. All registrations and comments received thus far is attached as APPENDIX 21 of Appendix D.

i) Addressing Comments and Concerns

A Comments and Response Report (C&RR) has been compiled as part of the Public Participation Process for the Ergo Mining Solar (PV) Energy Phase 2 project currently underway. This document records the issues of concern, questions and suggestions contributed by stakeholders during the Environmental Authorisation Process and the Water Use License Application Process. This report also includes the responses provided by the relevant parties. The Comments and Response Report (C&RR) is attached as APPENDIX 20 of Appendix D. It should be noted that the Comments and Response Report is an active document which will be updated throughout the process as comments and concerns are received. However, following submission of all final documents to the relevant Competent Authorities (CAs), all additional comments should be directed directly to the relevant CAs.

j) Notifying I&APs of The Decision

Following the verdict by the DMRE on whether to grant or reject the Environmental Authorisation Application, all registered I&APs will be informed of the decision as well as the appeal process and its timeframes for submission, if applicable.

iii.Summary of issues raised by I&APs

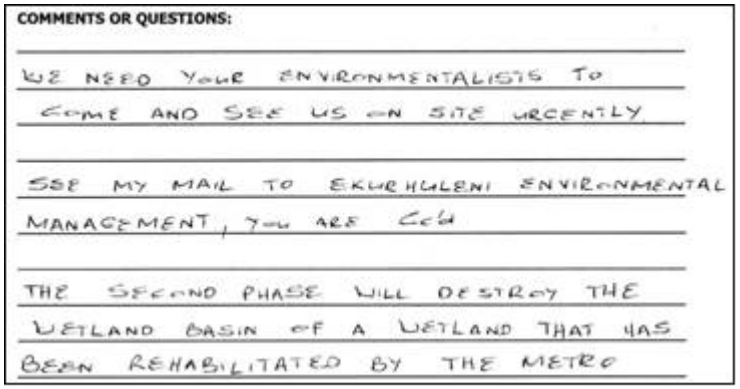
(Complete the table summarising comments and issues raised, and reaction to those responses)

Table 10: Summary of comments and issues raised by the I&AP

Interested and Affected Parties *List the names of persons consulted in this column, and* *Mark with an X where those who must be consulted were in fact consulted.*		Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
AFFECTED PARTIES					
Landowner/s					
Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties – See Appendix E					
Format: Email Name: Keith Edmond	x	2021/11/26	Good Day I am the owner of *[address not disclosed]*. I would like to be kept up to date on developments in this project. Regards	Good day Keith, We hereby confirm your registration as an Interested and Affected Party.	Appendix D

				Please be assured that you will receive all relevant future communication in this regard. Regards	
Format: Email Name: Prudence Geyer and Jared Geyer	x	2021/11/26	Hi Chantel I trust you are well, we spoke a while back regarding the property erf *[address not disclosed].* We are interested in selling the property, is it possible for you to find out if ERGO is interested in purchasing the property? or perhaps you know of an interested party? We are open to offers, the erf is +- 56 Hectares situated opposite Egro mining and has their pipeline running at the back of the property. I have attached our municipal account with the details of the property. Your assistance will be highly appreciated Thank you Regards	Dear Prudence/Jared, I will forward your request to the Environmental Assessment Practitioner. Perhaps they know which avenues to follow in this regard. Regards	Not related to EIA process, therefore not further considered as part of this process.
Format: Email in which EnviroRoots was CC'd Name: Santjie White		2021/12/09	Dear all, Please see attached as discussed. The second phase proposal looks like it will destroy the basin of the Wetland. Wetlands are protected by the Environmental Act and also by International treaties. The proposal is in the Wetland and in a grassland that is also marked as a place of environmental importance in the Ekurhuleni Spatial Development plan.	Good day Santjie, Many thanks for providing us with your comments. Kindly note that that for the Scoping phase of the Environmental Authorisation Application process, the entire study area comprising of	Section 8) of scoping report.

			I will send a full report on the area as there are some areas that are of Environmental importance that was marked for your second phase by SANBI as a place where there are species on the red data list. We need our Environmental Managers to support us in the saving of our precious water resources as well as our grass and wetlands. Kind regards Regards	approximately 560 ha will be scoped and assessed by the appointed independent Specialists. However, for a 40 MW Solar PV Facility only approximately 80 to 100 ha of the area investigated will be required for development. Following assessment of the entire study area, the independent Specialists will demarcate/map all sensitive areas and will recommend buffer zones and/or no-go areas for protection of sensitive environmental features. We welcome and value your input and suggestions. Kindly therefore provide us with a map and/or coordinates of the sensitive areas referred to in your email. We will forward this to the independent Specialists for their consideration as part of their investigations. Regards	

Format: Registration and Comment Sheet Name: Santjie White	x	2021/12/09		Good day Santjie, Many thanks for providing us with your comments. Kindly note that for the Scoping phase of the Environmental Authorisation Application process, the entire study area comprising of approximately 560 ha will be scoped and assessed by the appointed independent Specialists. However, for a 40 MW Solar PV Facility only approximately 80 to 100 ha of the area investigated will be required for development. Following assessment of the entire study area, the independent Specialists will demarcate/map all sensitive areas and will recommend buffer zones and/or no-go areas for protection of sensitive environmental features. We welcome and value your input and suggestions. Kindly	Section 8) of scoping report. To be further investigated in Impact Assessment Phase.

				therefore provide us with a map and/or coordinates of the sensitive areas referred to in your email. We will forward this to the independent Specialists for their consideration as part of their investigations. With your permission, we will furthermore forward your request for onsite meetings to the independent Ecological and Aquatic/Wetland Specialists. Please confirm whether we have your consent to provide the relevant specialists with your contact information. Regards	
Format: Email Name: Santjie White	x	2021/12/10	Good afternoon Chantel, We value and appreciate the opportunity as quoted below. "With your permission, we will furthermore forward your request for onsite meetings to the independent Ecological and Aquatic/Wetland Specialists. Please confirm whether we have your consent to provide the relevant specialists with your contact information."	Good day Alicia, Kindly refer to the email below, received from Santjie White, also CC'd in this email. Could you please liaise with the project Biodiversity Specialists regarding the email thread below and provide Santjie's and	To be further investigated in Impact Assessment Phase.

			Please understand that we welcome the project but we need to work around the critical biodiversity. We have a vast amount of photographic evidence, sightings etc. Both Jeanne-Michele and I grew up here. Our details are as follows and we would really love to work with your teams. Regards	Jeanne-Michele's details to them? Santjie has requested for the independent Ecological and Aquatic/Wetland Specialists to contact her regarding information sharing on the Phase 2 Solar PV Project. Many thanks in advance. Kind regards	
Format: Email Name: James Stewart	x	2022/01/06	Chantel, As discussed briefly on the phone, I have four properties (listed below) that are contiguous with the properties shown on the plan in your document. I would be grateful if you could ask your client if they would be interested in acquiring these properties. Portion 270 (a portion of Portion 263) of the Farm Witpoortjie 117-IR Portion 275 (a portion of Portion 263) of the Farm Witpoortjie 117-IR Portion 276 (a portion of Portion 263) of the Farm Witpoortjie 117-IR Portion 277 (a portion of Portion 263) of the Farm Witpoortjie 117-IR Regards,	Good day Alicia, Kindly refer to the email below received from James Stewart. James is looking to sell his properties to the proponent, if interested. Could you please forward his request and contact information to the correct persons in this regard? Many thanks! Regards	Not related to EIA process, therefore not further considered as part of this process.

Format: Email Name: Victor Mazibuko	x	2022/03/29	I am beekeeper in the surrounding area and do removal and relocation of bees should such exist in your area of work do not hesitate to contact me to do removals. It takes a lot in the activity of the bee keeper to do the removals thus such costs are effective in our services rendition.	Good day Mr. Mazibuko, We hereby acknowledge receipt of you comments submitted via Registration and Comment Sheet on 29 March 2022. Please be assured that your comments will be provided to the applicant for their consideration and will be included in the Comments and Responses Report which will be submitted to the Regulatory Authority. Regards	Appendix D
Format: Email Name: Santjie White	x	2022/03/30	Good morning, Chantel, Please accept our apologies for not being able to attend the meeting this morning. It is too unsafe for us to be wondering in that area specially with the service protests all around us. WE have one concern which is not a new one. We have extended a hand of friendship to your company to take them to the sites which obviously were not penned down correctly as intensive studies were never done in this area. Had long discussions with one of your ladies which promised that the whole team will pay us a visit. This never happened. Sadly. I even gave them ideas on how to launch	Good day Santjie, Kindly note that the proposed Ergo PV Phase 2 project falls within the ambit of a Scoping and Environmental Impact Assessment (EIA) process. This legal process for the Phase 2 project is currently in Scoping Phase. At Scoping level, potential anticipated impacts are proposed at desktop level in	To be further investigated in Impact Assessment Phase.

			a community project in terms of wet and grasslands and will have a positive impact on the mine. To no avail. 1: The Grass Owls do exist – we have seen 6 breeding pairs in the last two months. 2: The Marsh Harrier do exist – she landed in my back yard with a snake 3 weeks ago. 3: The old graves from the Voortrekkers do exist. 4: The grassland across the road from us is indeed critical with the archeologic possibilities and the possible meteorite site. 5: We have found critically endangered species across the road in the veld. 6: The wetland has been rehabilitated by the EMM at a huge cost and if this wetland is not saved, I will escalate in terms of fruitless expenditure of taxpayer money. Please understand that we are not against the project and that this could be beneficial to the area if certain aspects are considered. I still would like to sit down and discuss the many positive off spins this project can generate. One critical thing – the area must be closed in for preservation and the high voltage lines must be equipped with flappers. Regards	preparation for the EIA phase during which the comprehensive impact assessments will be conducted. The EIA phase cannot be finalised and submitted until the Competent Authority has approved the Scoping Phase Report. Upon approval of the Scoping Report, the independent Specialists will prepare for and conduct their field assessments. Note that the independent specialists are legally obliged to report scientific findings and recordings for the area. Therefore, as requested in previous email correspondence, please provide us with your photo evidence including coordinates for all recordings. We will share these with the specialists to ensure that the information is taken into consideration during the compilation of their reports.	

				All independent specialist reports will indicate feasible and reasonable mitigation measures for inclusion in the Environmental Management Programme (EMPr) appropriate to level and scale of the proposed project and its anticipated potential impacts. Your below list of findings and the recommendation will in the mean time be forwarded to the Environmental Assessment Practitioner for their consideration. Regards	
Format: Email Name: Victor Mazibuko	x	2022/04/23	Greetings Chantel The loadsheddimg has been a challenge as result data network was affected during the week so my late response. Yes let the development proceed as it ensures development in the right direction with almost no unintended effect to the society or community of Withok. Earlier on submissions you recommended the availability of a 20 to 40ha of land should the community want to use it productively for agricultural purposes and yes will revert back one a clear plan on grain crops to plant by the coming summer season for	Good day Mr. Mazibuko, Kindly note that no recommendations or commitments had been made by the project team in terms of land availability for community crop production nor in terms of the availability of agricultural implements for community use.	Appendix D

			commercial purpose and growth and development so the reason to also have a tractor to utilise is a challenge. With that said and done we shall use the land fruitfully so. Should there be bees in the surrounding of the mining plant as well as the panels installed area consider me for such removal and relocation of bees to my plot 29 Hannes visage straat, Withok Brakpan. Thank you very much for the opportunity to be able to interact with the Withok community for mutual development and benefits. Kind regards,	As mentioned during the Public Participation Meeting held on 30 March 2022, all community requests have been captured and will be relayed to the correct persons at Ergo. The project will aim to obtain a symbiotic relationship between the project and the community. Enterprise Development (ED) and Socio-Economic Development (SED) projects will be implemented to ensure the benefit of Economic and Social Development in the local area. For the project there will thus be local community focus. Community benefits will form part of the ED and SED projects to be implemented for the proposed project. Once operations commence, community forums will be established, where matters regarding community benefits	

				need to be raised with the Ergo management team. Please be assured that your comments will be provided to the applicant for their consideration and will be included in the Comments and Responses Report which will be submitted to the Regulatory Authority. Kind regards	
Format: Email Name: Terry Luckhoff		2022/06/30	Is this email intended for CWW? Regards	Good day Terry, It is our understanding that CWW Manufacturers is the registered landowner for Witpoort Estates Agricultural Holdings No. 222, in the Brakpan Area, Gauteng. Therefore, as a landowner near the study area for the proposed project mentioned in the subject matter above, CWW has been included as an Interested and Affected party on	Appendix D

				the proposed project and have been provided opportunity to comment on the documentation pertaining to the Environmental Authorisation Application and the Water Use License Application. Kindly confirm whether CWW would like to remain an I&AP on this process or whether you would like us to rather remove the email address from the list. Please also correct us if CWW is not the current landowner of Witpoort Estates Agricultural Holdings No. 222. Regards	
Format: Email Name: Joe Mohlala		2022/07/04	Dear Chantel. Thank for your email dated 30 June 2022 regarding the EIA (Phase 2) I have said in the past that your communications do not specify the impact of the envisaged project to our property,	Good day Joe, As mentioned in all previous communications as part of the Public Participation Process, the proposed development	Appendix D

			land and animals . Therefore, I still request a meeting with your firm to discuss this matter to my understanding so as to comment correctly. As for now I stand to object to this proposal because it is likely to affect our property and animals without any compensation thereof. I will hear from you.	will be situated on Ergo owned land and no development is planned for privately owned properties. Note that the independent Draft Environmental Impact Assessment Report and Specialist Reports will be made available to the public for review and commenting purposes once applicable. The above-mentioned report will encompass a comprehensive impact assessment taking all relevant aspects into account. Interested and Affected Parties will therefore have the opportunity to peruse the documents and view the potential impacts associated with the proposed development. Regards	

Format: Email Name: Joe Mohlala		2022/09/08	Dear Chantel. We acknowledge receipt of your email and its contents. Our land is adjacent to ERGO, to the extent that we are sharing a fence. Hence there is no way the proposed project cannot affect our land. However, we shall await your impact assessment report as stated in your email. Regards.	Good day Joe, It is hereby confirmed that the Draft Environmental Impact Assessment (EIA) Report notification was forwarded to you on 11 September 2022. We look forward to your comments on the report and the comprehensive impact assessment. Regards	Appendix D.
Format: Email Name: Anton Haywood		2022/09/12	Good day Hi i just want to find why im i receiving this message what it about im staying close to ergo mine Witpoort Estates just want to know what's this about (Phase 2: Public Commenting Period for TSHEDZA 3 Investments (Pty) Ltd: Environmental Authorisation Application Draft EIA and EMPr from 2022/09/12-2022/10/12) Thanks regarding	Good day Anton, Kindly find the attached notification and Background Information Document for your attention. We look forward to any comments you might have.	Appendix D.

				Regards	
Format: Email Name: Nico van Niekerk		2022/09/12	Chantel 1. Is this separate and in addition to the initial one? 2. I have a interest in my property (138 Floors Street) where the buyers are looking for 100 hectares adjacent to mine also for a 40MW Solar Farm I have given them your detail for the EIA. Kind Regards	Good day Nico, The proposed 40 MW PV Facility falls within the ambit of a full Scoping and Environmental Impact Assessment (EIA) process. The previous notification sent was to notify I&APs of the availability of the draft Scoping Report for Public Commenting, whereas the notification sent on 11 September 2022 was to notify I&APs of the availability of the draft Environmental Impact Assessment Report and Environmental Management Programme for public commenting. Kindly note that the proposed 40 MW facility forms Phase 2 of the phased approach project of which the prior planned and applied for Phase 1 project (19.9	Appendix D.

				MW PV Facility) has already been granted Environmental Authorisation. As mentioned in the Background Information Document distributed, the final complete facility will generate ±60 MW of energy. Many thanks for providing your buyers with our details. Perhaps you could forward theirs to us as well and we'll formally invite comments from them. Regards	
Format: Email Name: Joe Mohlala		2022/09/20	Dear Chantel. I don't have record of the email dated 11 September 2022 as stated in your correspondence dated 19 September 2022. Please resend it to me so that I can attend to it as requested. Regards.	Good day Joe, As requested, kindly find the below email and attached notification sent to you 11 September 2022. Regards	Appendix D
Format: Email Name: Santjie White		2022/10/03	Good afternoon, Chantel, Thanks, all the reports that we were able to have interaction, with the experts, are written comprehensively and correct.	Good day Santjie, Kindly note that the Terrestrial Fauna Species Assessment for	Appendix D. DFFE Biodiversity does not foresee any fatal flaws should

			We still have one major concern. The Fauna report is omitting a huge number of species and therefore not conclusive. It was the only expert that did not contact and visit us. Sadly, the fauna plays a huge role in this area with Suikerbosrant so close. Really sad. Kindest regards	the project has been compiled taking the relevant promulgated Protocols into account. It is therefore confirmed that the legal requirements for the study, taking the study area and potentially occurring Species of Conservation Concern (SCC) into account, has been met. Note that, on 2022/02/03, EnviroRoots requested for you to provide us with a map and/or coordinates of the sensitive areas referred to in your correspondence, for us to forward the information to the relevant Specialists for their consideration as part of their investigations. Furthermore, in a separate email from the Environmental Assessment Practitioner on the same day, you were asked to forward a map highlighting the wetland areas you refered to with regards to the proposed 40MW PV project site.	stringent mitigation be implemented.

				Preceding the above, EnviroRoots indicated to you via email on 2021/03/30 that Specialists welcome comments and encourage collaboration with I&APs who may have details of key species occurring within their respective areas. On 2022/03/31 EnviroRoots also requested for you to please provide us with your mentioned photo evidence including coordinates for all recordings. Your daughter, Jean-Michele, was in turn requested on 2022/03/25 to provide EnviroRoots with the stated 15 years' worth of listings and records done by herself to ensure that the relevant specialists consider the information. To date, none of the above requested information has been provided to EnviroRoots.	

				As confirmed with the Fauna Specialist, the Specialist was prepared to meet you on site but due to project rescheduling and seasonality (and pre-existing traveling arrangements of the fauna specialist) the follow up surveys were organised very quickly, and the specialist had limited time on site. Due to this the Fauna Specialist did send apologies via the Flora Specialist, who met you at a later date. The Flora Specialist was requested by the Fauna Specialist to retrieve any specific important local fauna knowledge. Two species were provided: Aardvark (not a TOP species and was not discussed) and Pangolin (does not naturally occur in the area and not discussed any further). Although the current legislated protocols only require assessment on the SCCs, the	

				Terrestrial Fauna Species Assessment addresses ecological services of all historically recorded species and species confirmed during the surveys (and includes these species lists) AND also includes threatened (including local Red-Listed and Global IUCN species) and protected species, which also includes other potential SCCs; all other than the additional SCC assessment are not required under the current protocols. Therefore, the report is more comprehensive in terms of species than is currently required under legislation. Note that the Terrestrial Fauna Species Assessment has been updated to include omissions on three trigger SCCs (these species were omitted as they do not have distribution over the area).	

				We confirm that, as part of the Public Participation Process, all registered I&APs (including yourself) were notified of the relevant commenting periods within which to provide input and comments on the application documentation, including the Terrestrial Fauna Species Assessment. Note that all comments received throughout the process together with the responses provided will be submitted to the Department of Mineral Resources and Energy as part of the Public Participation Report for their consideration. We trust that you find the above in order. Regards	
Municipal councillor - See Appendix D					
Format: Email Name: Henry Buitendacht (Ward 82)		2022/09/12	Good day I've raised the objection before and om raising it now	Good day Cllr,	Appendix D.

			Please use Geluksdal and Tdakani offices to view documents Brakpan is very far and has nothi g to do with the Geluksdal community Again, i appeal to you to use Geluksdal and Takani officed	Kindly note that the draft documents are placed at two localities (as indicated in the notification letter). These include the Brakpan Library and the Tsakane Customer Care Centre. This is done to ensure that the document could be reached by the entire Brakpan community, including the Geluksdal and Tsakane areas. Note that the Tsakane Customer Care Centre is situated adjacent to Geluksdal near the Tsakane Community Hall and Ekurhuleni Municipal Offices for the area. The Tsakane Customer Care Centre is easily accessible from Geluksdal and the commute short. Regards	
Municipality - See Appendix D					
Format: Email Name: Martin Bekker (Ekurhuleni MM)	x	2021/11/29	To whom it may concern at Enviroroots.	Good day Martin,	Appendix D.

			Kindly forward communications of this nature to our Environmental Resource Management Department, in order for them to record the matter on their records and for them to then liaise with the appropriate departments within the City of Ekurhuleni, as each respective matter may warrant. If our Environmental Resource Management Department require inputs from other departments within the city, they will communicate with such other departments accordingly. The relevant colleagues in the said department are as follows (and they are also copied herein): [contact details not disclosed] Kindly update your stakeholder database accordingly for purposes of future communication in respect of other projects as well. The above is proposed in the interest of facilitation proper co-ordination in dealing with this type of matter within the City of Ekurhuleni Municipality. Kind regards,	Many thanks for the information. The contact details provided has been included in the I&AP Register and will receive all relevant future communications regarding the proposed project. Regards	
Format: Email Name: Martin Bekker (Ekurhuleni MM)	x	2022/03/23	Dear Chantel Based on my previous correspondence to you (in which I availed the contact details of the relevant officials in our Environmental Resources and Waste Management Department, for these types of matters) I wish to advise that for your record purposes, this type of notification to myself must not be construed as official notification to the City of Ekurhuleni. Official notifications to the City of Ekurhuleni must go to the said officials from the Environmental Resources and Waste Management Department. Kind regards,	Dear Martin, Please be assured that all Ekurhuleni contacts provided has been added to the I&AP and have subsequently been informed via email. Regards	Appendix D

Format: Email Kwanele Mdletshe (Ekurhuleni MM)	x	2022/03/28	Hi Chantel, Can you kindly send a Hard copy for this. We are restricted to download Links. It must be delivered to [details not disclosed]. Regards,	Dear Kwanele, Could you please confirm whether a flash drive with the documents on would perhaps be sufficient? The document is quite large, however, if a hard copy is still required we will send this asap. Looking forward to hearing from you soon. Regards	Appendix D
Format: Email Kwanele Mdletshe (Ekurhuleni MM)	x	2022/03/29	Hi Chantel, A flash drive will be. Regards,	Many thanks Kwanele, Kindly provide a cell number for the courier waybill. Regards	Appendix D
Format: Email Bongeka Mtyana (Ekurhuleni MM)		2022/05/03	Good day, Kindly find herein attached comments for your attention. Regards	Good day Bongeka, This email serves as response to the comments received from Ekurhuleni Metropolitan Municipality on 03 May 2022 under reference GP 30/5/1/2/2 (158) MR. • It is confirmed that comprehensive impact	Appendix D

			Dear Sir/Madam, **Subject: COMMENTS FOR THE DRAFT SCOPING REPORT (DSR) FOR THE PROPOSED CONSTRUCTION OF A SOLAR PHOTOVOLTAIC (PV) PLANT TO GENERATE UP TO 40 MW OF ENERGY (PHASE 2), BRAKPAN, CITY OF EKURHULENI METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE** Your Draft Scoping Report (DSR) Report dated March 2022, which was received on 29 March 2022 refers. 1. The City of Ekurhuleni hereby comment as follows: 2. The parameters/constraints of the study area were assessed against the following environmental management tools: • Gauteng Provincial Environmental Management Framework (GPEMF), 2015; • The Ekurhuleni Bioregional Plan, 2012; • Specialists' studies conducted for the proposed development and attached to this application; and • Applicable By-Laws, policies and requirements of the Ekurhuleni Metropolitan Municipality. 3. The applicant, (Tshedza 3 Investments (Pty) Ltd) proposes to construct a PV facility capable of generating up to 40 MW, the aim of the proposed project is to add onto the approved Phase 1 project (19.9 MW PV, substation, 100MWh battery energy storage system (BESS), and 11km of 22kV overhead powerlines) to generate up to 59.9MW of energy in total to sustainably supply the existing Ergo Mining Brakpan Plant and the Brakpan/Withok Tailings Dam facility with clean and stable electricity during grid curtailments and outages through embedded generation. 4. The proposed project is intended to produce excess energy through the solar energy facility (SEF) that will feed back into the grid. The mine can therefore contribute toward alleviating the current pressure on the Eskom grid through the construction of the proposed SEFs. 5. The proposed construction of Solar Photovoltaic at Ergo Mining plant is within an area where there are other similar developments within the vicinity as such this proposed location will blend in with existing facilities. 6. The Ekurhuleni Bioregional Plan 2012, the proposed project locations fall within Ecological Support Area 1 & 2 and some parts on Critically Biodiversity Area 1. Therefore, you are advised to conduct a detailed Ecological Impact Assessment in order to ensure that there is no further loss of habitat and no deterioration in ecological condition. 7. It has been indicated on the DSR that there is internal road to be upgraded, you are advised to provide the diameter of which the road will be expanded.	assessments will be conducted for the following ecological aspects: o Wetland and Aquatic; o Avifauna; o Terrestrial Fauna; and o Terrestrial Flora. These independent Specialist Assessments will determine the level of impact expected to occur to the area ecology and will propose appropriate mitigation measures to limit/prevent the anticipated impacts. • In the event that internal existing roads require upgrading, these will remain below the NEMA triggered thresholds. Therefore, potential road	

			8. Furthermore, the following specialist, Visual Impact and Socio-Economic Impact Assessment should be conducted in detail once the Scoping and Plan of Study has been accepted. 9. According to Ekurhuleni ArcGIS the proposed project falls within a dolomitic area, therefore the council for geoscience must be consulted for comments. 10. No activity must encroach watercourse without water use license authorisation from the Department of Water and Sanitation, should this activity not require WULA you are required to furnish the City with the proof on the Final Scoping Report that there is no WULA needed for the proposed project. **General Comments:** 11. Recommendations made in the specialists' reports conducted for this project must form part of the mitigation measures, be implemented and adhered to at all time. 12. Mitigation measures contained in the Environmental Management Programme (EMPr) attached as Appendix G must be implemented and adhered to at all time. The content of the said EMPr must comply with Annexure 4 of the EIA Regulations, 2014 as amended. 13. No development related activities should take place within the identified wetland and wet grasslands boundaries or associated buffer zones around delineated sensitive areas. 14. Clearance of indigenous vegetation must be limited to the development footprint. Re-vegetation of cleared surfaces and landscaping of disturbed area must be done with the use of indigenous vegetation. 15. Inadequate management of exposed surfaces may result in dust pollution and soil erosion occurring from the site, therefore adequate measures such as the use of dust suppression techniques must be employed to minimize the occurrence of these potential impacts. 16. Maintenance plan must be developed for continuous monitoring and eradication of weeds, alien and invasive species on the properties. 17. All types of waste generated during each stage of the development from site preparation to final construction must be disposed of at a licensed disposal site. Should the disposal of waste be the responsibility of the applicant, a safe disposal certificate should be obtained from the waste disposal company to indicate that the waste has been disposed of at the correct waste site. Dumping of waste on open spaces is strictly prohibited. 18. All types of waste generated during operation of the proposed use must be disposed of in accordance with the municipal waste disposal requirements. 19. Hazardous waste generated on the property must be properly handled and disposed of at an appropriate landfill site designated for such type of waste. 20. Provincial noise regulations as outlined in Provincial Notice No. 5479 of 1999: Gauteng Noise Control Regulations must be complied with at all times. During construction phase, construction equipment may only operate between the hours of 08h00 and 17h00 on weekdays, 08h00 and 13h00 on Saturdays, with operation being prohibited on Sundays and Public Holidays. 21. An emergency response plan must be developed for accidental incidences/emergencies which may occur. The said plan should clearly outline corrective actions to be undertaken and prevention of recurrence thereof.	expansion activities have not been applied for. • It is confirmed that a comprehensive Visual Assessment and Socio-Economic Assessment will form part of the project EIA Phase. • The council for geoscience will be added to the I&AP Register and will be provided the opportunity to provide comments and input during the DEIA phase of the project. • A Water Use License Application will be lodged with the Department of Water and Sanitation as part of the proposed development.	

			22. The Stormwater management plan must be approved by the Department of Roads and Stormwater of the CoE. Additional stormwater runoff must be adequately managed. 23. All activities to be undertaken on the property must be in accordance with the applicable By-Laws, policies and requirements of the City. 24. In addition to the above, all relevant legislation and requirement of other government Departments (i.e. National, Provincial), in particular Section 28 (duty of care) of NEMA, must be complied with. "Duty of care" to the environment, means that every person has a duty to avoid pollution and environmental degradation. 25. The applicant is reminded of Section 24F of the NEMA, Act No 107 of 1998, as amended, that, no listed activity may commence prior to an environmental authorisation being granted by the competent authority. Regards,	• All relevant recommendations and mitigation measures specified by the applicable independent Specialists will be captured in the project Environmental Management Programme (EMPr) for implementation, if approved. • The compiled EMPr will comply with Annexure 4 of the EIA Regulations, 2014, as amended and will be legally imposed on the applicant through the issuance of an Environmental Authorisation, if granted by the DMRE.	

				• It is noted that the independent ecological assessments undertaken will identify no-go areas and appropriate buffer zones which must be implemented to protect sensitive areas. • Where applicable, the project EMPr will specify appropriate measures to manage aspects such as vegetation clearance, re-vegetation, landscaping, erosion control and dust control. • The ecological assessments will determine whether and to what extent weeds/alien and invasive species have	

				established within the proposed footprint areas and will furthermore suggest appropriate mitigation measures to manage existing communities and to prevent further population thereof. • The project EMPr will appropriately address waste management to be implemented through all phases of the proposed project for all waste types to be generated. • The project EMPr will furthermore list appropriate noise control measures to be implemented in consultation with the Noise Specialist and will specify applicable emergency response	

				measures for accidental incidences/emergencies. • As part of the project EIA phase, the Draft EIA and EMPr, including the Hydrological Assessment (Surface Water and Storm Water Management) will be submitted to the Ekurhuleni Department of Roads and Stormwater for their input. • The responsibility remains with the applicant to ensure that all activities to take place on site, if approved, is conducted in accordance with all relevant applicable By-Laws,	

					Policies, Requirements and Legislation. It is noted that the Draft EIA and EMPr, together with all Specialist Assessments, will be made available to the Municipality for review and commenting purposes. We trust that the Municipality finds the above in order and look forward to further comments. Regards	
Organs of state *(Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWS etc.)*						

Format: SARIS Name: Andrew Salomon		2022/07/25	**Proposed 80-100 hectare Solar PV development located on Ergo Mining owned land adjacent to the Withok Estates Agricultural Holdings in the area of Brakpan within the City of Ekurhuleni Metropolitan Municipality, Gauteng Province. The site is located approximately 6km south of the Brakpan central business district. Farms included in scoping assessment totaling about 557ha include: Portion 9 of Farm Withok 131 IR; Portion 183; 272 and 283 of Farm Witpoortje 117 IR; Holdings 203 - 208; 240-245; 296-303; 348-355 of Withok Estates Agricultural Holdings** **Van der Walt, J. July 2021. Heritage Scoping Report For The Proposed Ergo Mining 40mw Solar (Pv) Energy: Phase 2 Project, Gauteng Province** The proposed development entails a photovoltaic facility and associated infrastructure. The author noted that that the study area is characterised by cultivation and mining activities from the 1940's onwards with various features relating to the built environment occurring in the area, that is older than 60 years, and therefore protected by Heritage Legislation. In addition, previous assessments in the area recorded Stone Age sites, of which one occurs in the study area, and more sites can be expected especially close to water sources like pans and streams. A grave site is indicated on the 1976 topographical map of the area but not on subsequent or previous maps and it is not certain if the grave site still exists. The author recommends that a field-based impact assessment should be conducted. The SA Palaeontological Sensitivity Map indicates that the study area has a mixture of Low, Moderate and Very High fossil sensitivity. No palaeontological assessment is attached to this case. **Interim Comment** The SAHRA Archaeology, Palaeontology and Meteorites Unit supports the author's recommendation that a field-based archaeological impact assessment should be conducted. In terms of palaeontological heritage, the SA Palaeontological Sensitivity Map indicates that the study area has a mixture of Low, Moderate and Very High fossil sensitivity, therefore a palaeontological desktop study is required and based on the outcome of the desktop study, a field assessment is likely. Once this study has been submitted, along with the field-bases archaeological assessment, SAHRA will be able to provide further comments. Should you have any further queries, please contact the designated official using the case number quoted above in the case header. Yours faithfully	Good day Andrew, This email serves as response to the Interim Comment received from SAHRA on 25 July 2022 pertaining to the project mentioned in the subject matter above. It is confirmed that a field-based Archaeological Impact Assessment and a Desktop Palaeontological Study has been conducted for the project EIA phase and will be uploaded onto SAHRIS for SAHRA's attention. Regards	Appendix D
Communities -					
Format: Public Participation Meeting	x	2022/03/30	Topic 01: General Matters		

Name: Community Members			It was asked whether the attendees could make their own recording of the meeting.	Ms. Muller confirmed that the meeting is a public meeting and that attendees were welcome to make their own recordings.	Appendix D
			It was asked whether apologies could be offered for the persons unable to attend the meeting, but whom are still represented by attendees at the meeting.	Ms. Muller expressed appreciation and indicated that the apologies could be added to the meeting minutes.	
			The names of represented but absent members of the community were vocalised. However, it was indicated that the list would be provided to EnviroRoots following the meeting.	Ms. Muller expressed appreciation for the list so as to correctly include all relevant community members in this regard. The following apologies were recorded during the meeting: - Philip - Mpumi - John - Steven - Ephron - Amelia - Marius van Zyl - Sol M. - Elsie - Elizabeth - Lourens	
Format: Public Participation Meeting	x	2022/03/30	Topic 02: The Phase 1 Project (20 MW)		Appendix D

Name: Community Members			It was indicated that the previous meeting (Phase 1) recording had not been shared with the community via email.	Ms. Muller indicated that the files were too large to send via email, however, that these could be made available via a Dropbox link for download. The community expressed understanding and indicated their satisfaction with the written meeting minutes as received previously.	
			It was asked whether the previous concerns raised were addressed.	Ms. Muller indicated that the substantial number of concerns raised during the Phase 1 public meeting were addressed and included in the Final Basic Assessment (BA) as submitted to the DMRE.	
			It was asked to confirm whether the community received the Phase 1 Environmental Authorisation document.	Ms. Muller confirmed that all persons registered as I&APs on the Phase 1 project received the Environmental Authorisation for the Phase 1 project to which some community members confirmed that the document was received via email.	

			Ms. Nkosi enquired from Ms. Tibbits to confirm that the community has received the Environmental Authorisation for the Phase 1 project.	Ms. Tibbits indicated that she cannot vouch for anyone but herself having received the document, since only her name appears on the email that she received.	
			Ms. Nkosi asked Ms. Tibbitts whether she sent the email to the community.	Ms. Tibbits responded to indicate that she had not forwarded the email, seeing that the notification needs to be sent by the EAP.	
			Ms. Nkosi then asked whether the email was only sent to Ms. Tibbits.	Ms. Muller indicated that the document was sent to all registered I&APs on the Phase 1 project.	
			An I&AP mentioned that SMSs were also received by some community members.	Ms. Muller indicated that all I&APs who provided email addresses received the notification via email whereas I&APs who only provided a cell phone number received the notification via SMS.	
			It was indicated that the Environmental Authorisation for the Phase 1 project was currently temporary.	Ms. Muller clarified that the Environmental Authorisation cannot be actioned until the appeal process lapses, but that it is indeed a final and permanent	

				document as received from the DMRE.	
Format: Public Participation Meeting Name: Community Members	x	2022/03/30	Topic 03: The Phase 1 (20 MW) Project vs. Phase 2 Project (40 MW)		Appendix D
			It was indicated that the community understood the Phase 1 project to also have covered the Phase 2 project in all Specialist Reports.	Ms. Govender (EAP) indicated that the two Phases of the project do link into each other, however, that the two phases remain two separate processes because it is situated within separate land portions. She added that the same Specialists are used for both project phase applications. Therefore, associated comments captured during the Phase 1 project can be included for assessment in the Phase 2 project, if applicable. Ms. Dean (Client Rep) explained that, as discussed during the first project phase, applications have/will be lodged for a 20 MW and a 40 MW respectively, since the mine needs 60 MW of power in total for current operations. The Phase 1 project involved the 20 MW plant together with	

					ancillary infrastructure (i.e., power lines and battery energy storage systems (BESS) etc.). The Phase 2 project therefore only involves the placement of more panels as the ancillary infrastructure to support the additional panels had already been included and assessed in Phase 1. Therefore, when looking at the study area it should be noted that additional panels will not be placed on the entire study area but just some of the areas within the indicated study area scoped.	
				It was asked whether it was correct in saying that Phase 1 and Phase 2 involved the blocks indicated during previous meeting - which means that the additional blocks now indicated were an expansion of the whole works.	By way of indication on the map available during scoping and part of the presentation, Ms. Dean explained that the new blocks indicated in red polygons on the map relates to the Phase 2 project. Phase 1 entailed a 20 MW PV Plant together with a power line, BESS and a substation. During the Phase 1 project it was indicated that the	

					process for the 40 MW was to commence soon and that this would require a full EIA process since it would be situated on a vaster adjacent area of land. The current Phase 2 process was therefore conducted to enable more panels to be linked to the 20 MW (Phase 1).	
				It was indicated that what was being said made sense, however, that it was contradictory to what the community was led to believe to be Phase 1 and Phase 2, which were both situated within the initial smaller area indicated. The community has therefore been put under the wrong impression being provided information that indicated only a small portion to be developed and not all of the land currently indicated.	By way of indication on the map, Ms. Govender confirmed the locality of the Phase 1 project (20 MW). She further explained that on the locality map for the Phase 2 project, the entire plots are highlighted in red polygons to indicate the area that is scoped, but in actual fact the Phase 2 panels will not be situated on the entire area scoped. She further indicated the areas of the actual layout planned for the impact assessment phase vs. the entire scoped area. Ms. Govender further indicated the properties to be avoided where Specialists have indicated environmental	

					sensitivities as identified during the scoping phase. The purpose of the scoped area was therefore for the Specialists to determine sensitive environments to be avoided and to guide infrastructure establishment on areas where the least environmental impacts would be experienced. As indicated by Ms. Govender it has always been said that the mine would require 60 MW, however that this would be assessed in a phased approach. Ms. Dean indicated her understanding for where the I&AP may have experienced confusion regarding the Phase 1 and Phase 2 projects seeing that the Phase 1 project comprises two separate areas on the same farm portion (area was initially separated due to unnatural ponding between the proposed panelling footprint). These are the same areas that were	

					discussed with the I&APs during the Phase 1 public meeting and approved during the Phase 1 project Basic Assessment process. Further to this, Ms. Dean expressed understanding for the I&AP experiencing confusion when seeing the vast area earmarked in the map as proposed for the Phase 2 project. She noted that the entire marked area relates to plots and plot numbers, however, that the entire area of plots indicated on the map will not be developed. Ms. Govender confirmed that the Phase 2 map highlights the boundaries of the properties that have been earmarked, which is not a flection of the actual project footprint at this stage.	
				It was indicated that although it is stated as properties "earmarked" or "proposed" this will lead to approval of the entire area indicated.	Ms. Govender confirmed that approval cannot be obtained for all the properties indicated on the map. A specific layout with the assessment of alternatives within	

				the earmarked properties are submitted to the DMRE for approval. In the Scoping Report it is stated that approximately 575 ha is available (which has been assessed from a desktop level as part of the scoping assessment) of which only 80 to 100 ha will be required for the Phase 2 project footprint.	
			It was asked whether the DMRE have approved what had been proposed.	Ms. Govender confirmed that no approvals have been granted yet for the Phase 2 project. Following the Scoping Phase, the Impact Assessment Phase will be conducted to determine the final layout which will then be presented to the I&APs as well during the next set of public consultation meetings to be held during the impact assessment phase.	
Format: Public Participation Meeting Name: Community Members	x	2022/03/30	Topic 04: Scoping Report		Appendix D.
			It was asked whether a full impact assessment should not have been included in Phase 1.	Assuming that reference was made to the Scoping Phase for the Phase 2 (40 MW) project, Ms. Muller indicated that anticipated	

				impacts are listed in the Scoping Report, however, that the complete impact assessment will be conducted as part of the Impact Assessment Phase. Note that the impact assessment for the Phase 1 (20 MW) project had been concluded and that Environmental Authorisation has been granted. All I&APs registered for the Phase 1 project had the opportunity to comment on the Phase 1 Basic Assessment (which included the impact assessment criterion) at the time.	
			It was asked for communications to be as comprehensible as possible.	Ms. Govender confirmed that a transparent process is conducted, and that the EAP needs to legally explain all the project information to the I&APs, including the impacts identified. All information is captured in the reports for I&APs to read and understand. The reports are written as comprehensible as	

				possible, however, still needs to include the project technical detail, which is assessed by the Departmental Specialists. A summary is provided in the reports to indicate the main project aspects in simple terms. This is then followed by the Public Participation Meetings whereby the project is furthermore explained to the I&APs.	
Format: Public Participation Meeting Name: Community Members	x	2022/03/30	Topic 05: Specialists		Appendix D.
			It was asked how it would be ensured that the Specialists would be fair in their reporting and not favour the mine.	Ms. Govender indicated that all appointed Specialists are independent and registered with SACNASP. The Specialists must note scientific evidence in their reports. This means that they will, on this basis, identify site sensitivities following which the client will be advised on the findings to thereby place the infrastructure on less sensitive land. The Specialists therefore remain independent and will lose their right to practice if found to	

					be bias towards the mine. She continued to indicate that the independent EAP furthermore has a responsibility to appoint unbiased Specialists who are knowledgeable and have experience with the type of infrastructure i.e. renewable energy and PV Plants. Ms. Govender added to indicate that a Socio-economic Specialist forms part of the team. This Specialist deals specifically with the public and will be conducting a site investigation to interview businesses, community leaders and so forth. Her job will therefore specifically be to analyse how the proposed project would impact on the community and surroundings. Ms. Govender further indicated that Ms. Muller is a Public Participation Specialist and that her job is also therefore to deal directly with the general public,	

				and I&APs and to ensure that all comments and concerns received during the EIA process are captured and adequately responded to in the public participation section of the Scoping and EIA reports.	
			It was indicated that the Specialists conducting assessments were in direct liaison with the mine, but not the community. It was therefore asked that the Specialists inform the community in the event that the community will be affected in any way.	Ms. Muller indicated that i.e. during the Scoping Phase there were community members that specifically requested to be in contact with the Ecological Specialists. Contact with the required Specialists has therefore been arranged as required. It is also important to note that the Specialists deal directly with the independent EAP and not directly with the mine. The community will in turn be informed of specialist findings from the EAP/Public Participation Practitioner- through the EIA reporting and public meetings.	
			The I&AP then asked to be placed on the list to have direct consultation with the Ecological Specialists.	Ms. Muller indicated that it could be arranged, and a formal	

				request should be made in writing.	
Format: Public Participation Meeting Name: Community Members	x	2022/03/30	Topic 06: Socio-Economic		Appendix D.
			It was enquired whether the Socio-economic Specialist would directly deal with the community.	Ms. Govender explained that the project was currently in Scoping Phase during which potential impacts are determined from a desktop point of view. During the next stage (the impact assessment stage) the Socio-economic Specialist will conduct her site investigation. Therefore, if any I&APs would like her to engage directly with them it could be noted for the necessary arrangements to be made. However, it should be noted that the Socio-economic Specialist will not be engaging in a meeting setting since the Public Participation meetings are specific for this purpose. The Socio-economic Specialist might communicate in whichever manner suits both parties involved in the conversation i.e. a phone call.	

				Ms. Muller reiterated that the Socio-economic Specialist Study is a study separate to the Public Participation Process and that the Socio-Economic Specialist will deal with individuals on a one-on-one basis as required for the impact assessment. The Phase 1 (20 MW) assessment will work as a baseline for socio-economic issues captured for the area and be included in the Phase 2 (40 MW) assessment.	
			It was indicated that in this case the Socio-economic Specialist will therefore not be dealing with the "us" as a collective.	The I&AP was answered by another community member to highlight that individual concerns should be dealt with individually. Ms. Govender added that all comments received through the Public Participation Process would be provided to the Socio-economic Specialist. The Specialist would therefore be fully aware of the public's concerns, thereby enabling her to	

				take these into consideration when compiling her report.	
			It was asked whether the Socio-economic Specialist would be addressing the problems raised during the previous commenting period.	Ms. Govender indicated that the previous commenting period formed part of a separate process. Although the previous process feed into the current process it should be remembered that the previous process was conducted on portions of land separate to the current land portions applied for. The EIA applications are land specific.	
Format: Public Participation Meeting Name: Community Members	x	2022/03/30	Topic 07: General Impacts		Appendix D.
			It was indicated that the community was not yet aware of the impacts that the proposed development might have on the community and that if issues arise once the infrastructure has been installed it might be too late for the community to complain.	It was indicated by an I&AP that a copy of the report was received by the community in November 2021 and the I&AP was asked whether she commented on the document as was requested. It was confirmed that the community had received feedback on the previous comments provided.	

					The I&AP continued to indicate that the panel would be expected to provide feedback at a later stage seeing that, at the moment, a proper explanation was being given. Initially it was spoken of the 60 MW but only 20 MW was applied for and now an application is being lodged for the additional 40MW. Meaning from the onset it was indicated that 60 MW will be required in total by the mine.	
				It was indicated that there were no Specialist or Department assessing the community's concerns such as Health, Animals, Soil etc. at the time and that all these assessments were still to be done.	An I&AP answered to indicate that the EIA reports would be made available to all I&APs and that the Specialist Assessments to be conducted will not be in favour of the mine, but will be done taking all parties involved into account. Mr. van Heerden (Project Engineer) confirmed that Specialist Work to be conducted remains independent of the mine and is for the attention of all	

					I&APs. It is the responsibility of the Specialists to indicate where it is acceptable for the PV panels to be situated. He used the example that, when having built a house on a property one cannot sporadically decide just to make additions to your house. One needs to apply to make those additions. Therefore, even though you buy a property and thus own the entire property, one can place a fence around it and can park your car anywhere on it, you still cannot erect a fixed structure without applying and getting the necessary approvals for it. The same principle applies in this project case, in that following Specialist Studies a plan (layout) is submitted to the DMRE for approval. Additional panels cannot just be added i.e. in a year's time- a new application would be required.	

			Concern was indicated as to whether the residents' children would be able to inherit the land their parents bought in the area or whether it would turn into a dump or unhealthy space to live in i.e. relating to air, water, dust etc.	Ms. Muller highlighted that all proposed development would take place on Ergo owned land and that no development is planned for privately owned properties. She further indicated that the mitigation measures relating to the mentioned matters have been addressed as part of the Phase 1 project. Ms. Muller explained that dust accumulation on panels is not preferred, and that the panels will therefore be kept clean, with mitigation implemented for dust control at the project site. Mr. van Heerden explained that vegetative growth below the panels will be maintained, thereby minimising dust generation at the PV plant. Ms. Govender explained that the EMPr for the project will be written in such a manner as to explain to the mine how to operate the plant. Dust mitigation	

					was covered extensively in the EMPr for Phase 1 (20 MW) and will be carried through for the Phase 2 EMPr. Mr. van Heerden and Ms. Govender explained that the project cannot account for the mining dust and that this assessment relates to the PV Plant only. Mr. van Heerden indicated that the infrastructure to be erected will be similar to the poles utilised to erect a fence gate and that these would not affect groundwater. Ms. Govender explained that the panels for the PV facility would typically be the same as panels installed on the roof of a house. Therefore, note that if panels do not affect you in your house, it would not affect the surroundings.	

			It was asked whether the EAP could guarantee that no impacts would occur to individuals.	Ms. Govender indicated that the assessments done during the Phase 1 project revealed no adverse effects on health and well-being and furthermore indicated no noise or vibration impacts. Mitigation measures are included in the EMPr. Mr. van Heerden added that many solar plants have been built across South Africa and many solar panels have been installed at i.e. malls on roofs where shopping is done. The panels do not create radiation. The panels absorb the sun's radiation and turns it into electricity. There's no transmission, only absorption.	
			The matter of security was raised.	Ms. Govender explained that the Socio-economic Specialist Study would address potential security concerns. Appropriate mitigation measures would be specified in this regard. It is noted that due to the expensive nature of the PV Plant infrastructure, the mine	

				would likely increase security to protect the expensive infrastructure whereby the community would also benefit.	
Format: Public Participation Meeting Name: Community Members	x	2022/03/30	Topic 08: Soil		Appendix D.
			Ms. Nkosi highlighted that it was noted during the first meeting that the community gave their concerns regarding poisoning of the land. The farmer's flock needs to feed off the land and crops need to come from the land.	Mr. van Heerden explained that the panels or structures itself do not give off radiation and will not change the current soil conditions. The panels will result in less evaporation from the ground as it shields the ground somewhat from the sun causing less heat on the ground. This generally improves plant growth within the area below the panels. I.e., some farmers in the Northern cape graze their sheep within the field below the panels. The structures on which the panels are mounted, in principle, is similar to the steel structures used in fencing and for keeping gates up right.	
			To the above, it was added (by Ms. Tibbits) that according to the Environmental Authorisation access control must be enforced and a fence must be placed around the PV Plant. However, that this will prevent the community from utilising the improved	Ms. Dean explained that the point made in Mr. van Heerden's response is that the PV plant	

			grazing land mentioned by Mr. van Heerden. Access control will not benefit the community and will prevent access to the grazing land.	would not affect Ms. Nkosi's grazing land at her residence. No radiation will be given off and no farmers' crops would be affected. Solar plants, regardless of where built, is non-invasive to plants sub-structure to the PV Plant and it furthermore does not affect anything in the adjacent vicinity. Further was noted, that the mine is proposing the development on their own privately owned land.	
Format: Public Participation Meeting Name: Community Members	x	2022/03/30	Topic 09: Community Benefits		Appendix D.
			It was indicated that, during the previous meeting, mention was made that the community would like to assist with the planting of trees where required so as to benefit from the project. The community would like job opportunities whereever possible.	Ms. Dean confirmed that the project aims to obtain a symbiotic relationship between the project and the community. Enterprise Development (ED) and Socio-Economic Development (SED) projects will be implemented to ensure the benefit of Economic and Social Development in the local area. Furthermore, within the Construction Phase facilitations roll-out Ergo has a strict protocol in using the local community when and where the	

					community can contribute. For the project there will thus be local community focus. Mr. van Heerden added that from a vegetation management perspective there will be cleaning and fence line maintaining that needs to take place i.e., labour that can be sourced locally.	
				It was mentioned that since the area is rural agricultural in nature, the community would appreciate to have boreholes at each stand. These boreholes would have to run via solar energy and not electricity. Further to the above it was indicated that the community requires an indication of community benefits from the project and that the community requires streetlights, tar roads and access to excess power.	Ms. Govender explained that community benefits form part of the ED and SED projects to be implemented for the proposed project. Ms. Muller noted that, once operations commence, community forums will be established, where matters regarding community benefits need to be raised with the Ergo management team. With regards to accessing electricity generated, as mentioned during the Phase 1 project, excess power would be fed back into the	

				Eskom Grid to alleviate the pressure on the grid. Excess electricity would therefore not be supplied to individuals but will be fed back into the Eskom grid to benefit the country as a whole. Mr. van Heerden indicated that due to price increases in electricity, the mine is impacted which leads to an increase their pricing as well. Therefore, by reducing their electricity cost, the mine pricing could remain feasible. Although the individual might not directly benefit from the PV facility, benefits will be felt indirectly in other ways. Ms. Muller added that the requests regarding boreholes have been captured, which is legally required by the Environmental Process. These comments and questions will be relayed to the correct persons at Ergo.	

			It was asked whether, when reference was made to a training centre, the training centre referred to was the Ergo Business Development Academy (EBDA).	Ms. Dean indicated that EBDA has a training centre that focusses on more formal skills training such as fitting and turning, welding etc. Linked to them Ergo has a strategic alliance with a training entity called Resolution Circle where the focus is on skills development across a wider variety of skills levels.	
			Further to the above it was asked for the applicant to indicate how the youth of the community could be assisted to enrol for the training to obtain the required skills prior to commencing with the project operations.	Ms. Dean highlighted that, as indicated during previous communications, Mr. Abiot Kekana of Ergo Mining, would identify community representation points within the community who will be responsible for communications with the community. Following establishment of this network, the required roles and skills would be identified and communicated to the community for the community to then put forward name suggestions.	

				Mr. van Heerden added that training would most likely not focus on the shorter-term construction period but rather on the long term 20-to-25-year operational life of the plant. Skills development in terms of maintenance and other service criteria is therefore preferred.	
			It was asked whether the community youth would get employment and whether opportunities for small companies exist.	Ms. Govender indicated that, as part of the Socio-economic Report, the number of employment opportunities to be created by the Phase 2 project will be listed. She further explained that each phase of the project would have a different range of job requirements/opportunities. Mr. van Heerden indicated that it depended on the type of companies referred to. I.e. a local nursery could be supported where planting of trees would be required.	

			It was enquired as to whether the PV facility would have a canteen to which chickens could be supplied.	Mr. van Heerden indicated that there should not be a canteen or restaurant on the premises since there were existing shops within the surrounding area.	
			It was asked whether the project could obtain a special tractor with implements which could be sourced for community use.	Ms. Muller indicated that the comment had been captured.	
Format: Public Participation Meeting Name: Community Members	x	2022/03/30	Topic 10: Mining Activity		Appendix D.
			It was indicated that the community were not just concerned about the Phase 2 PV project, but also regarding how Ergo and the mining activities had affected the community in the past. These include aspects such as the areas farmed, community health, dust, roads, construction, water use etc.	The community indicated that they have mandated 8 persons as community representatives to engage with Mr. Abiot Kekana regarding community-mine related matters. It was also pointed out by Ms. Dean, that Mr Kekana was present at the meeting, and was open to discuss mine related issues post the close of the meeting. Ms. Muller added that from the Public Participation Process's side all comments will be captured and relayed back to the mine or to Mr. Kekana. She	

				further indicated that mine-related questions should be kept separate to matters related to the current PV Project Process.	
Format: Public Participation Meeting Name: Community Members	x	2022/03/30	Topic 11: Timelines		Appendix D.
			It was asked what the estimated timeline was for implementation of the project.	Ms. Dean indicated that the first kickoff point would be the 22 kV overhead power line which would be in the foreseeable future, therefore within this year, probably commencing within the next month or two.	
			It was further indicated that the community requires information on when exactly the project will start, where it will start, and which roads would be used.	Ms. Dean indicated that for the 20 MW plant the power line, which is part of Phase 1 would start from within the Ergo Plant and within the tailings dam and would be erected towards each end to join up. This would happen within the next month or two. Construction on the 20 MW plant is planned to commence in August 2022. It had furthermore been agreed that 10th Road/Rennie Road would not be utilised for construction purposes. By way of showing on	

				the map Ms. Dean indicated the access point to be utilised for the construction phase.	
			It was asked whether the 20 MW plant as per Phase 1 was operational at this time.	Ms. Muller confirmed that approval has been obtained via the Environmental Authorisation as received from the DMRE. However, that an appeal process followed during which the decision could be appealed, however, with valid reasons. For the duration of the appeal process the project cannot continue until the appeal process lapses. If any appeals were submitted the Department would assess these and if any appeals were found to be valid the Department would then retract the Environmental Authorisation until the appeal is resolved. However, if no valid appeals were lodged, the Environmental Authorisation would stand and only then could construction continue.	
Dept. Land Affairs -					

Format: Email in which EnviroRoots was CC'd Name: Solomon Maruma (DALRRD)	x	2021/11/26	Good day Desiree Please find land claim enquiry for your attention. Please work on the enquiry and submit it to my office for signing as you that both Amu and Fundiswa are on quarantine until the 3rd December 2021. Chantel, please note that received of your land claim enquiry is acknowledged. You are further advised that the office's turnaround time for responding to land claim enquiries is 14 days. Regards	Dear Solomon, Many thanks, much appreciated. We await the Department's response. Regards	Appendix D.
Format: Email Name: Fundiswa Ndaba (DALRRD)	x	2021/12/21	Good morning Kindly receive the attached confirmation letter for your attention. Regards **LAND CLAIMS ENQUIRY – HOLDING 203, 204, 205, 206, 207, 208, 240, 241, 242, 243, 244, 245, 296, 297, 298, 299, 300, 301, 302, 303, 348, 349, 350, 351, 352, 353, 354 & 355 OF WITHOK ESTATES AGRICULTURAL HOLDINGS, REG DIV (N/A), GAUTENG** We refer to your land claim enquiry dated **26 November 2021**. We confirm that as at the date of this letter no land claims appear on our database in respect of the Properties listed as per attached list. This includes the database for claims lodged by 31 December 1998; and those lodged between 1 July 2014 and 27 July 2016 in terms of the Restitution of Land Rights Amendment Act, 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 lodged but not yet been 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 actual 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 so as to enable us to do a further search.	Good day Fundiswa, Many thanks for the information. Received. Regards	Appendix D.

Format: Email Name: Fundiswa Ndaba (DALRRD)	x	2021/12/21	Good morning Kindly receive the attached confirmation letter for your attention. Regards **LAND CLAIMS ENQUIRY – PORTION 183, 272 & 283 OF THE FARM WITPOORTJE 117, REG DIV IR, GAUTENG** We refer to your land claim enquiry dated **26 November 2021**. We confirm that there is/are an existing land claims against the Property/ies. The claims were lodged as per attached list. The claim was lodged in terms of the Restitution of Land Rights Amendment Act, 2014 (Act No 15 of 2014) ("the Amendment Act") which, amongst others, reopened the lodgement of claims for a period of five years. The validity of the Amendment Act was challenged in the Constitutional Court. The Constitutional Court found the Amendment Act to be invalid because of the failure of Parliament to facilitate public involvement as required by the Constitution. The Amendment Act ceased to be law on 28 July 2016. 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. Parliament has so far not been able to pass new legislation and has instead approached the Constitutional Court for an extension until 29 March 2019 and the application was rejected. As a result the Commission will, unless directed otherwise by Constitutional Court, not be processing claims lodged between 1 July 2014 until 27 July 2016 until all the claims lodged on or before 31st December 1998 are finalised and or a new Act is passed by Parliament and signed into law by the President. In the meantime, the Commission through the Chief Land Claims Commissioner has been ordered to report the progress of all the outstanding land claims on six months basis for monitoring by the court. The Commission will contact you directly and communicate widely once we have been granted permission to begin dealing with these claims.	Good day Fundiswa, Many thanks for the information. Received. Regards	Appendix D.
Format: Email Name: Fundiswa Ndaba (DALRRD)	x	2021/12/21	Good morning Kindly receive the attached confirmation letter for your attention.	Good day Fundiswa,	Appendix D.

			Regards **LAND CLAIMS ENQUIRY – PORTION 9 OF THE FARM WITHOK 131, REG DIV IR, GAUTENG** We refer to your land claim enquiry dated **26 November 2021**. We confirm that there is/are an existing land claims against the Property/ies. The claims were lodged as per attached list. The claim was lodged in terms of the Restitution of Land Rights Amendment Act, 2014 (Act No 15 of 2014) ("the Amendment Act") which, amongst others, reopened the lodgement of claims for a period of five years. The validity of the Amendment Act was challenged in the Constitutional Court. The Constitutional Court found the Amendment Act to be invalid because of the failure of Parliament to facilitate public involvement as required by the Constitution. The Amendment Act ceased to be law on 28 July 2016. 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. Parliament has so far not been able to pass new legislation and has instead approached the Constitutional Court for an extension until 29 March 2019 and the application was rejected. As a result the Commission will, unless directed otherwise by Constitutional Court, not be processing claims lodged between 1 July 2014 until 27 July 2016 until all the claims lodged on or before 31st December 1998 are finalised and or a new Act is passed by Parliament and signed into law by the President. In the meantime, the Commission through the Chief Land Claims Commissioner has been ordered to report the progress of all the outstanding land claims on six months basis for monitoring by the court. The Commission will contact you directly and communicate widely once we have been granted permission to begin dealing with these claims.	Many thanks for the information. Received. Regards	
Format: Email Name: Khuthala Dlamini (DALRRD)	x	2022/04/06	Good day Kindly email the locality map and title deed of the above mentioned farm. Kind Regards	Good day Khuthala, Trust that you are doing well. Attached is the project Background Information Document which includes a locality map and a list of properties assessed as part of the project.	Appendix D

				The property list is quite extensive and since the Public Participation Specialist do not have direct access to Title Deed documents we would have to request these from the EAP. Kindly note that we have already received the land claim status for all listed properties from DALRRD. Please confirm whether you would like us to continue and request the Title Deeds for all project properties. Regards	
Format: Email Name: Khuthala Dlamini (DALRRD)		2022/04/26	Good day Yes I'm still waiting for the tittle deed. Regards	Good day Khuthala, Kindly confirm the reasoning for requiring the Title Deeds of the 32 properties forming part of the application for me to formally request these. Regards	Appendix D
Format: Email		2022/05/03	Good day	Dear Khuthala,	Appendix D

Name: Khuthala Dlamini (DALRRD)			Title deed is needed in all applications to verify the sizes and property descriptions. Regards	Please forward a number whereby to contact you. I would just like to make sure what the title deeds are needed for when I lodge my request to the client. Regards	
Format: Email Name: Jack Tjotola		2022/08/16	Good day My names Jack, for the, Department of Agriculture, Land Reform and Rural Development we have received your application and there are outstanding document required for us to proceed with your application 1: Tittle deed 2: Locality map Regards	Good day Jack, Kindly find the attached locality map. Could you please confirm the DALRRD's requirement for the property Title Deeds? As already mentioned to Khuthala Dlamini, the property list is quite extensive (32 properties) and since the Public Participation Specialist do not have direct access to Title Deed documents we would have to request these from the EAP.	Appendix D.

				We would therefore like to gain understanding for the DALRRD requesting these documents as the NEMA application is lodged to the DMRE. DALRRD has been requested to provide comments on the draft documentation, however, an application has not been lodged with DALRRD. I've furthermore attached the notification of the availability of the draft EIA and EMPr for your attention. We look forward to your comments. Regards	
Traditional Leaders -					
Dept. Environmental Affairs					
Format: Email Name: Mmatlala Rabothata (DFFE)	x	2022/04/22	Dear Ms. Muller, Please receive the attached comments from Directorate: Biodiversity Conservation for your attention and implementation.	Good day Ms. Rabothata, We thank the DFFE Directorate: Biodiversity Conservation for the comments provided via email on	To be further investigated in Impact Assessment Phase.

			Trust that you find all in order. Regards, **COMMENTS ON THE DRAFT SCOPING REPORT FOR THE PROPOSED CONSTRUCTION OF A SOLAR PHOTOVOLTAIC (PV) PLANT TO GENERATE UP TO 40 MW OF ENERGY (PHASE 2), BRAKPAN, CITY OF EKURHULENI METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE** The Directorate: Biodiversity Conservation reviewed and evaluated the draft report. Based on the information provided in the report, the site is not within a National Freshwater Ecosystem Priority Area (NFEPA) catchment, no National Protected Areas Expansion Strategy (NPAES) in close proximity to the development as well as Important Bird Areas (IBA). Moreover, the site is currently vacant, and the development is proposed on a portion of land that was previously two gold mine tailings facilities with a small portion on degraded natural areas. Therefore, the Directorate does not object the development. Notwithstanding the above, the following recommendations must be considered in the final report: • Sensitive habitats in close proximity to the development footprint must be avoided or demarcated and regarded as No-Go areas. (i.e. Wetland). • A detailed site Rehabilitation Plan must be developed and all disturbed and cleared areas must be rehabilitated with indigenous perennial shrubs and grasses from the local area; to ensure that these areas do not become subject to erosion or invasive alien plant growth. • Wetland Rehabilitation Plan must be developed and incorporated in the final scoping report. • Suitable bird repelling structures and bird diverters must be considered to avoid collision of birds with the PV facility. The final report must comply with all the requirements as outlined in the Environmental Impact Assessment (EIA) guideline for renewable energy projects and the Revised Best Practice Guideline for Birds & Solar Energy for assessing and monitoring the impact of solar energy facilities on birds in Southern Africa.	22 April 2022 and herewith accordingly respond. The recommendations made will be provided to the relevant Biodiversity Specialists and the Environmental Assessment Practitioner for their consideration and incorporation into the respective Impact Assessment Reports, where relevant. Note that the above-mentioned reports will be conducted during the Impact Assessment Phase of the application process following acceptance of the Final Scoping Report by the Competent Authority (Department of Mineral Resources and Energy). At Scoping level, potential anticipated impacts are proposed at desktop level in preparation for the EIA phase during which the comprehensive impact assessments will be conducted.	

				For this reason and considering that the EIA phase of the application process cannot continue without approval of the Scoping Report, it would not be possible to submit Final Specialist Reports or a Wetland Rehabilitation Plan at Scoping level. Furthermore, all relevant applicable Guidelines will be taken into consideration when compiling the Final EIA Report. We trust that you find the above in order. Regards	
Format: Email Name: Tsholofelo Shalot Sekonko (DFFE)		2022/07/01	Noted. Please note: All Public Participation Process documents related to Biodiversity EIA review and any other Biodiversity EIA queries will be submitted to the Directorate: Biodiversity Conservation at Email: [email not disclosed] for attention of [name not disclosed]	No response required. This was a reply to the FSR Acceptance notification sent. The notification was sent to the relevant email provided.	N/A

Format: Email Name: Portia Makitla (DFFE)		2022/10/12	Good day Kindly find the attached comments for your consideration. Thanks & Regards **COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT PROPOSED CONSTRUCTION OF A SOLAR PHOTOVOLTAIC (PV) PLANT TO GENERATE UP TO 40 MW OF ENERGY CITY OF EKURHULENI METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE** The Directorate: Biodiversity Conservation has reviewed and evaluated the report. It is noted in the draft report that Critical Biodiversity Areas (CBAs) classified as Important to reach the conservation targets in the province are present on site. The CBAs indicate areas that likely comprise primary vegetation and could be suitable habitat for plant species of conservation concern. The ESAs present on the site are associated with the Withokspruit tributaries and drainage lines on and around the site. The vegetation of the proposed site was historically disturbed, main disturbance was cultivation, slimes- and tailing dams, edge effects from mining and damming of watercourses. Many of the anticipated project- specific impacts during the construction and operational phases can be successfully mitigated to moderate, low, and minor levels of significance, and are thus considered acceptable. However, it must be noted that any development within a very highly sensitive area that will result with significant negative residual impacts after mitigation is not supported. It is the Directorates view that with stringent mitigation measures the proposed development will not result in any fatal flaws or major impediments that will prevent the project to go ahead to the final EIA stage. Notwithstanding the above, the following recommendation must be considered in the final report: • Vegetation clearing within the sensitive grassland habitat, natural woody habitat and watercourse habitat must be limited to the approved areas • Erosion management plan and rehabilitation plan of natural vegetation must be developed to mitigate on habitat degradation and consider all phases of the development. • Search and rescue plan for the Species of Conservation Concern (SCC) must be developed and submitted for approval and • Alien Invasive Plant (AIP) Management and Control Plan must be designed and implemented to manage the alien plant species on site and the plan must be submitted as part of the final report. NB: The Public Participation Process documents related to Biodiversity EIA for review and queries should be submitted to the Directorate: Biodiversity Conservation at Email: BCAdmin@environment.gov.za for attention of Mr. Seoka Lekota.	Good day Portia, This email serves as acknowledgement of the DFFE's comments received on 2022.10.12 pertaining to the above subject matter. All relevant recommendations made by the DFFE will be taken into consideration when compiling the final EIA Report and EMPr. Please be assured that your comments will be submitted to the DMRE for their considerations during the assessment process. Regards	Appendix D. Recommendations to be considered in the final report.

Other Competent Authorities affected -					
Format: Pre-application Consultation Meeting Name: Environmental Assessment Practitioner (EAP), Senior Environmental Assessment Practitioner (EAP), DMRE, Applicant Representative	x	2020/11/26	Not verbatim: Discussion session Site 3) DMRE: The study area seems to be on an area deemed L3- which is a geographical area that has already been mined and disturbed. Battery Storage 4) DMRE: The facility will have battery storage, i.e. 40 containers, each 40 feet. Water Use Licence 5) DMRE: Will a water use licence be triggered by the proposed activity? 6) Senior EAP: Yes, a WUL will be triggered. There are wetlands/ pans around the proposed site. National Water Act Section 21 (c) and (i) most likely to be triggered, making the proposed site fall under a regulated zone. If the proposed site falls within 100m of a pan it will trigger a WUL. Should the site fall within 500m of a wetland, it will trigger a WUL. 7) DMRE: it is advisable to consult with DWS. 8) Senior EAP: Pro governance is important. DWS will definitely act as a commenting authority on the BAR and EIA process, and the WUL will be raised with the DWS. Specialist input 9) EAP: Planned specialist input 10) Avifauna 11) Surface Water Assessment and Strom water management	Refer to Discussion session and actions below. Actions 37) EAP to consult with DWS in terms of WUL and commenting authority 38) EAP to consult with GDARD regarding specialist input. 39) Conduct a baseline land contamination study 40) amend Mine Closure, rehabilitation and liability plan to include proposed PV facilities 41) Attach Ergo mining right to EIA application forms for both phases proposed.	Appendix D.

			12) Soils, land capability and agricultural potential assessment 13) Heritage Assessment (only for EIA) 14) Visual Assessment 15) Socio-economic Assessment 16) Water Use Licence 17) GIS Application 18) Additional potential studies that may be triggered 19) Terrestrial biodiversity (fauna and flora) 20) High level contaminated land assessment: 21) Wetland and Aquatic Impact Assessment 22) DMRE: EAP should consult with GDARD. Send GDARD a shapefile of the site to check against their most updated EMF. GDARD are better equipped to advise on environmental sensitivity and required site specific specialist input. GDARD can advise on requirements of terrestrial biodiversity specialist input. The DMRE do not have the tools/ GIS software and therefore rely on GDARD to offer such advice. 23) Senior EAP: Confirmed that GDARD currently have a 2018 EMF. The EMF is normally updated every 5 years. 24) EAP: requested a contact from GDARD to fast track the process. 25) DMRE: suggested contacting Albertina Setsiba from the GDARD biodiversity division. GDARD is based in Ghandi Square. Land Contamination 26) DMRE: be careful not to trigger an activity unintentionally, especially if the activity triggering the EIA process is not a contributing factor to contamination. 27) Senior EAP: Runoff from the area will be a problem of the new owner of the PV facility. It is important to understand the baseline site information. There		

			is vegetation currently growing on the proposed site- an indication that there is sufficient leaching taking place. Mine Closure, Rehabilitation and Liability Plan 28) EAP: The way forward in terms of the Closure, Rehabilitation and Liability plan –The proposed photovoltaic (PV) facilities can be included in the mine's current Closure, Rehabilitation and Liability plan. If this is acceptable, we proposed that the mine get their consultant's to amend the plan to include the PV facilities. At the end of life of the Mine, the mine can then decide if they would like to continue to operate the PV facilities and can then opt to relinquish their responsibility of the PV portions to the holding company of the PV facilities (as the PV facilities will be under a separate SPV). 29) DMRE: DMRE agrees with proposed approach, the Mine's future plans must tie in with closure objectives. EIA/ BAR templates 30) Senior EAP enquired about the templates required to be used for the EIA/ BAR process. 31) DMRE: DMRE uses the same EIA templates as the DEFF. 32) DMRE: Link the EIA/ BAR application forms and the existing mining right of Ergo. If the two are not linked, it will then look like a completely new development. DMRE is the competent authority for the purpose of the existing mining right. Purpose of running two different EIA processes (Phased approach) 33) DMRE enquired what was the point of running two separate EIA and BAR processes, i.e. a 10MW and a 50MW facility.		

			34) Senior EAP: Could all be part of the mine's planning, reasons behind this decision include regulated timeframes to get energy generation asap for the mine. The mine would like to run the PV development in a phased approach through phased applications that can be run concurrently. Could also be linked to a cash flow agreement. The mine could also possibly want to confirm if the 10MW facility is a correct working model for the mine before constructing the full remaining 50MW facility required. 35) Applicant Representative: Confirmed that the phased approach forms part of the technical design of the mine. Battery storage- the mine needs an urgent energy storage facility, as they face a major energy insecurity based on current practice. Current load shedding places added pressure on mining operations, the proposed PV facilities will reduce 25% reliance on the Eskom grid. Model is to discharge through pioneer storage, and utilize and maximise the renewable energy generation when the eskom grid is offline. This will enhance trading, and create reserve energy. 20MW peak can create 5 hours of reserve energy which will allow the mine to be more efficient. The mine wants the 10MW plant up and running ASAP. Eskom grid application needs to be taken into consideration, a generation licence can take 120 days. The FBAR can be used for a generation licence application. 36) Applicant Representative added that there is currently a lot of pressure on the mine from a cash flow issue- as the mine currently runs diesel generators which implicates carbon tax and decarbonization factors. The mine wants to expand but it needs a secure energy source for supply and demand. The proposed facilities are considered a priority and is quite urgent. The ramifications are therefore extreme should the mine not be able to secure its own power source with urgency. The average KW/price still needs to be determined.		

Format: Telephone Call Name: Mogale Matseba (DWS)	x	2021/11/30	Not verbatim: Mogale Matseba from DWS phoned to enquire about the Ergo PV Facility project. He is interested to know whether rehabilitation of the area proposed for development was approved and requested for proof of such to be forwarded to him. Mogale further indicated that the EAP will most likely receive an invite to the next forum meeting. He indicated the importance of highlighting projects of this nature in the Catchment. The next forum meeting will be in Feb next year.	Good day Mogale, Trust that you are doing well. Pertaining to our telephone discussion of yesterday, the proposed site for Ergo Phase 1 is proposed on land that is "currently vacant, and the development is proposed on a portion of land that was previously a gold mine tailings facility. This land has been re-mined, and subsequently rehabilitated to its current naturally vegetated condition which now comprises mostly disturbed grassland" (extracted from the DRAFT BASIC ASSESSMENT REPORT: PROPOSED ERGO MINING SOLAR ENERGY FACILITY PHOTOVOLTAIC PROJECT, PHASE 1: 19.9MW ON FARM WITPOORTJE 117 IR WITH ASSOCIATED POWER LINES, SOUTH OF BRAKPAN,	Appendix D, to be further assessed as part of the Impact Assessment Phase.

				GAUTENG PROVINCE, September 2021). A closure plan for the proposed Solar Energy Facility (SEF) up to 20MW (Phase 1) was included as part of the DBAR, which included the closure and rehabilitation plan for the proposed site (refer to attached report). The Project Company will decommission the solar facilities at the end of life of the SEF in line with Mine closure regulations. The Mine was advised to update their existing Closure, Rehabilitation and Liability Plan to include the SEF. The Mine Closure, Rehabilitation and Liability Plan was discussed with the DMRE during the preapplication consultation, and the DMRE was happy with this approach. We trust that you find the above in order.	

				Regards	
Format: Email Name: Musa Mangobe (DMRE)		2022/05/25	Good day Please find attached acceptance letter. Regards	Good day Musa, This email serves as acknowledgement of the DMRE's acceptance of the Scoping Report submitted in support of the application mentioned in the subject matter above. The conditions listed and applicable legal timeframes will be adhered to accordingly. A comprehensive Public Participation Process forms part of the application and will be submitted to the DMRE with the Environmental Impact Assessment Report. Furthermore, note that all registered I&APs have been	Appendix D

ACCEPTANCE OF A SCOPING REPORT SUBMITTED IN SUPPORT OF AN APPLICATION FOR AN ENVIRONMENTAL AUTHORISATION FOR THE PROPOSED CONSTRUCTION OF A SOLAR PHOTOVOLTAIC (PV) FACILITY AND ANCILLARY INFRASTRUCTURE TO GENERATE 40 MW PEAK OF ELECTRICITY LISTED IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT: EIA REGULATIONS (983) 2014 IN RESPECT OF PORTION 9 OF THE FARM WITHOK 131 IR, PORTIONS 183, 272 AND 283 OF THE FARM WITPOORTJE 117 IR AND VARIOUS AGRICULTURAL HOLDINGS OF THE FARM WITHOK 131 IR, SITUATED IN THE MAGISTERIAL DISTRICT OF BRAKPAN.

The Scoping Report (SR) and Plan of Study for Environmental Impact Assessment received by the Department on 29 April 2022 refer.

1. The Department has evaluated the SR and Plan of Study for Environmental Impact Assessment received on 29 April 2022 and is satisfied that the documents comply with the minimum requirements of Appendix 2(2) of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) as amended Environmental Impact Assessment (EIA) Regulations, 2014. In terms of regulation 22(a) of the NEMA EIA Regulations, 2014, the Department hereby accepts the SR and Plan of Study for EIA.

2. You may proceed with the environmental impact assessment process in accordance with the tasks contemplated in the Plan of Study for Environmental Impact Assessment as required in terms of the NEMA EIA Regulations, 2014.

3. Please ensure that comments from all relevant stakeholders are incorporated into the Environmental Impact Assessment Report (EIAR) to be submitted to this Department. This includes (but is not limited to) the Gauteng Department of Agriculture and Rural Development, Department of Agriculture, Forestry and Fisheries (DAFF), Department of Water and Sanitation (DWS) and the local municipality within which the application area falls. Proof of correspondence with the various stakeholders must be included in the EIAR. Should you be unable to obtain comments, proof of the attempts that were made to obtain comments should be incorporated into the EIAR to be submitted to this Department.

informed of the DMRE's decision to accept the Scoping Report.

Regards

			4. The EIAR must be submitted in accordance with Regulation 23 of the NEMA EIA Regulations, 2014. The Interested and Affected Parties (I&APs), during the Public Participation Process (PPP) of the EIAR, must be informed of the Department's decision to accept the Scoping Report. 5. You are hereby reminded to comply with the requirements of regulation 3 of the NEMA EIA Regulations, 2014 with regards to the time period allowed for complying with the requirements of the Regulations. 6. Please ensure that the EIAR includes the A3 size locality maps of the area and illustrates the exact location of the proposed development. The maps must be of acceptable quality and as a minimum, have the following attributes: • Maps relatable to one another; • Co-ordinates; • Legible legends; • Scale of not smaller than 1:50 000; and • Vegetation types of the study area. 7. Further, it must be reiterated that, should an application for Environmental Authorisation be subjected to any permits or authorisations in terms of the provisions of any Specific Environmental Management Act (SEMAs), proof of such application will be required. You are hereby requested to submit six (2) copies manually and one (1)		

			electronic copy through SAMRAD, of an EIAR, inclusive of any specialist reports and an EMPr which have been subjected to the public participation process of at least 30 days incorporating the comments received, including all comments from the competent authority. Kindly refer to section 24N(2) of the NEMA and Appendix 2, 4 and 6 of the NEMA EIA Regulations, 2014 for the minimum requirements set out for the aforementioned reports. The public participation process should be conducted as stipulated in chapter 6 of the EIA Regulations, 2014 and taking into consideration any guideline applicable for public participation. 8. Kindly note that acceptance of your scoping report does not grant you a right to commence with the listed activities applied for. Acceptance simply confirms that your application will be processed further and a recommendation on granting or refusal of an environmental authorisation will be forwarded to the Minister or his delegate for consideration, and the decision will be communicated as stipulated in regulation 4(1) of the NEMA EIA Regulations, 2014 (as amended). 9. Your attention is brought to Section 24F of the NEMA which stipulates "that no activity may commence prior to an environmental authorisation being granted by the competent authority". 10. Further note that in terms of regulation 45 of the NEMA EIA Regulations, 2014, your failure to submit the documents or meet any timeframes prescribed in terms of the said Regulations will result in your application deemed to have lapsed. 11. Note that commencement with a listed activity without an environmental authorisation contravenes the provisions of section 24F (1) of the NEMA and constitutes an offence in terms of section 49A (1) (a) of NEMA. Yours faithfully		
Format: Email Name: K. Govender (Gautrans)		2022/09/09	**PROPOSED ACCESS FROM DENNE ROAD / KOOT STREET (FUTURE K163) FOR PROPOSED SOLAR ENERGY FACILITY** The Department of Roads and Transport has no objection to the proposed access off Denne Road as per plan 4368/BP/01.	No response Required.	Appendix D.
OTHER AFFECTED PARTIES					

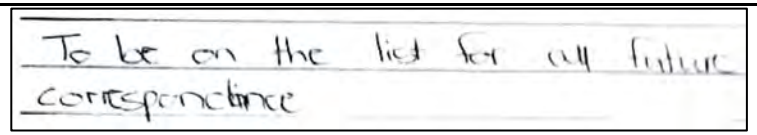
Format: Email Name: Danny Jacobs	x	2021/11/28	Good Evening Chantel Please can you forward me more details of the Ergo Mining Solar Development Project. Kind Regards	Good day Danny, Kindly find the attached notification and Background Information Document for your attention. Interested and Affected Parties (I&APs) are hereby invited to register and provide their comments/questions on the proposed project and related application processes currently underway. To ensure that you are registered as an I&AP and receive further information on this process, including information on the upcoming commenting periods for the Draft Scoping Report, Draft EIA Report and the Draft Water Use License Application (WULA) Technical Report, submit your comments and/or questions to EnviroRoots (Pty) Ltd at: Email: info@enviroroots.co.za	Appendix D.

				Address: P.O. Box 1082, Bapsfontein, 1510 Mobile: Ms. Chantél Muller at 084 444 2414 Please distribute the information as far as possible and provide EnviroRoots (Pty) Ltd with any additional contact information for any other potential I&APs that might be interested in receiving the documents for public commenting. NB Note: This process is a PUBLIC PROCESS. All comments and/or questions received from I&APs on this process is considered public knowledge. In accordance with the Environmental Impact Assessment Regulations (Government Notice No. R.982 of 4 December 2014, as amended) and the Regulations regarding the procedural requirements for Water Use License Applications and Appeals (Government Notice	

				No. R. 267 of 24 March 2017), EnviroRoots (Pty) Ltd will not keep any information of this nature confidential and will submit all comments and/or questions received to the Regulatory Authority. By providing comments, you consent to the above. Note that no contact information for I&APs will be made available to the public at any point during the process. However, names and surnames will accompany comments in the Comments and Responses Report (C&RR) to form part of this process. If you would prefer your name and surname to not accompany your comments kindly inform EnviroRoots of such. This Public Participation Process is conducted in accordance with Section 11(1)(c) of the Protection of Personal Information Act, 2013 (Act No. 4 of 2013), which allows for the processing of personal	

				information if processing complies with an obligation imposed by law on the responsible party and in accordance with Section 11(1)(f) of the Act which allows for the processing of personal information if processing is necessary for pursuing the legitimate interests of the responsible party or of a third party to whom the information is supplied. Regards	
Format: Email Name: Saul Magengenene	x	2022/01/06	Greetings Report received Just a quick question Are the house hold numbers, house that are affected by the installation or people who participated in the project	Good day Saul, Kindly note that the Interested and Affected Parties Register contain details of adjacent landowners within 500 m from the study area investigated for potential development. Notifying adjacent landowners and occupiers of the proposed project enables the nearby community to provide input to the project.	Appendix D.

				Further note that the area investigated for development is situated on Ergo owned land. Regards	
INTERESTED PARTIES					
Format: Email Name: Elvia Visagie	x	2022/02/16	Good day Chantel Please can you make sure that these stand's all belong to Ergo mining for I know for sure that Farm Witpoortjie 117IR Portion 204, 205 and 206 don't belong to Ergo Mining.	Good day Elvia, It is confirmed that Ergo Mining owns all properties listed in the Background Information Document. Note that Holdings 204, 205 and 206 of the Withok Estates Agricultural Holdings forms part of the study area. Portions 204, 205 and 206 of Farm Witpoortje 117 IR is not included in the study area. Regards	Not related to EIA process, therefore not further considered as part of this process.
Format: Email Name: Hilton Hunkin		2022/09/02	Good day Please see that we are contacting to request if your company has any other draft EIA in process for land in Ekurhuleni as that of ERGO /DRD site .	Good day Hilton, Kindly note that your request has been forwarded to EMA.	Not related to EIA process, therefore not further

			We are in the process of acquiring upto 40 MW PPA with Ekurhuleni and would be grateful to work with EMA on current or withdrawn EIA Noted that you have completed two for ERGO /DRD. Regards	Regards	considered as part of this process.
Format: Email Name: Joanne Greyling		2022/10/10		Good day Joanne, Kindly note that commenting on the Draft Environmental Impact Assessment Report has concluded. However, please be assured that your details have been added to the Interested and Affected Parties Register and that you will receive all future relevant communications regarding the application process. Regards	Appendix D.

iv. THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES

1. Baseline Environment

a) Type of Environment affected by the proposed activity

Climate

The Ergo Gold Mine is situated within an area characterised by summer rainfall patterns with sporadic rainfall events during the winter months. The mean annual precipitation is 692mm, with the bulk of the rainfall occurring between September and March (summer months). These high intensity rainfall conditions are conducive to high levels of surface runoff and subsequent erosion where soils are shallow, occur on steep slopes or are overgrazed. The wettest time of the year is January with an average of 123mm and the driest is June and July with 7mm (Table 11). The seasonality of precipitation is a driving factor behind the hydrological cycles of water resources within the area. Typically, watercourses have a higher flow rate during the summer months.

Mean temperatures vary between 9.7^{O}C to 19.7^{O}C for the Brakpan region (*Table 12*). The area is coldest in July with average minimum temperatures of 2.8^{O}C and hottest in November and December with average maximum temperature of 25.2^{O}C on average (Climate-data.org; Mucina & Rutherford, 2006; updated 2018).

Table 11: Mean annual rainfall data for the Brakpan area

	January	February	March	April	May	June	July	August	September	October	November	December
Mean Rainfall (mm)	123	96	86	42	19	7	7	9	24	65	105	109

Table 12: Temperature data for the Brakpan area

	January	February	March	April	May	June	July	August	September	October	November	December
Mean Temperature (OC)	19.7	19.6	18.4	15.7	12.8	10	9.7	13	16.8	18.5	18.9	19.7
Max Temperature (OC)	25	24.9	23.9	21.5	19.6	17.3	17.4	20.9	24.6	25.7	25.2	25.2
Min Temp (OC)	14.8	14.6	13.2	10.2	6.5	3.5	2.8	5.6	9.1	11.6	12.9	14.6

Topography

The project area is situated on a gently undulating to flat landscape. Average slopes are between 2% to 2.5% with maximum slopes of 11% within the northern section of the study site, where the existing Ergo Gold Mine Brakpan Plant is located. The altitude ranges from 1583m above sea level (absl) in the south-eastern portion of the study site and rises to 1659m absl in the northern extent of the study site (Figure 10). This gentle topography generally gives rise to slow hydological dynamics and associated unchallenned valley bottom and depression systems.

The topography of the study area is relatively flat and homogenous, consisting predominantly of plains (Figure 11). There are no prominent hills within the study area and the most prominent topographical features are the slimes dams (tailings dams) associated with the mining activity in the area.

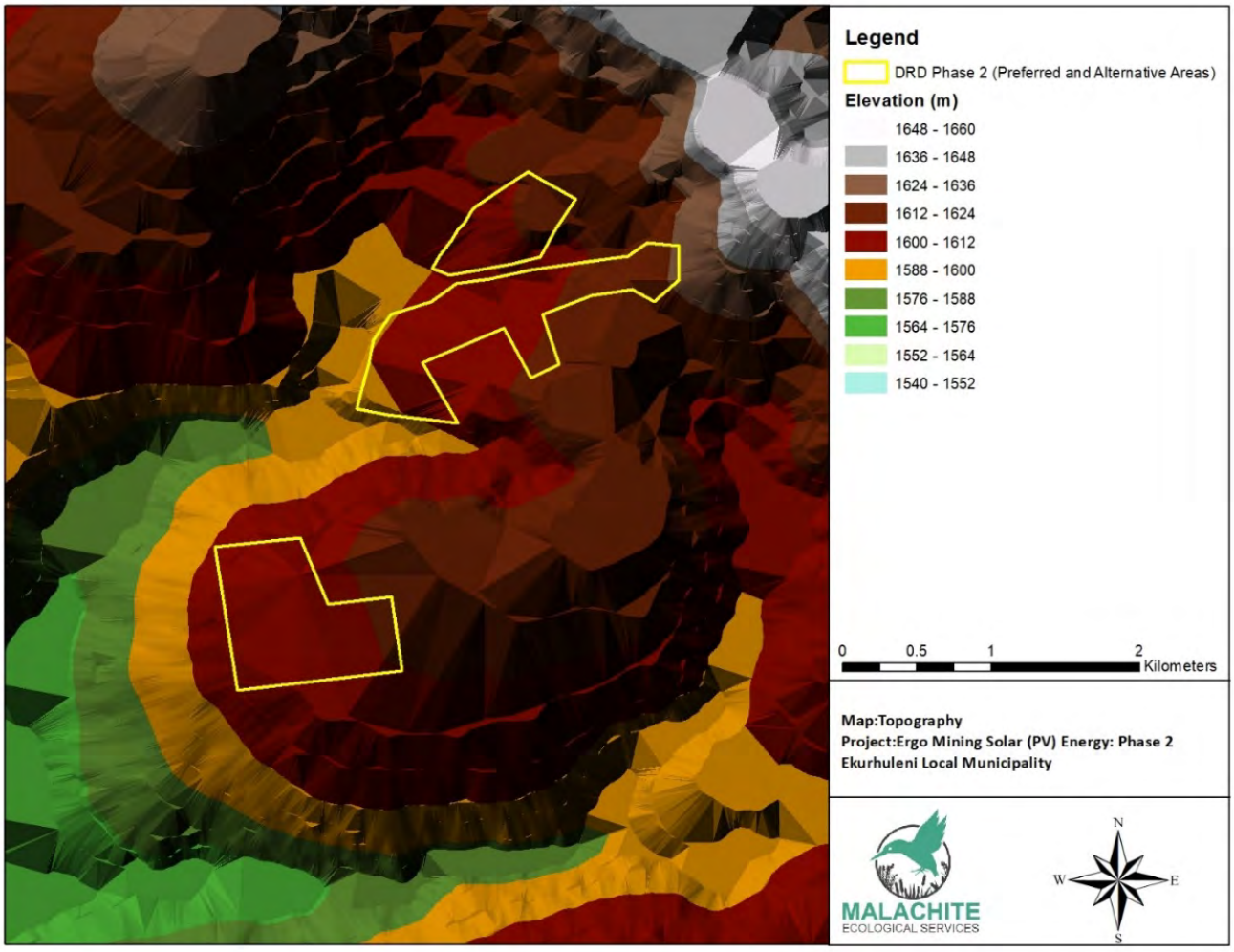


Figure 10: Topography of the proposed site showing the range in altitude

Figure 11: Topography and general environment of the proposed SEF site and surrounds.

Geology

The study area is underlain predominantly by the Ecca Group of the Madzaringwe Formation of the Karoo Supergroup. The geology of this region is primarily known to be sedimentary strata and is a very thick sequence of carbonaceous siltstone, mudstone, shale, sandstone and coal (www.agis.agric.za).

Soils (Land Type Data)

(Refer to Appendix J)

Land type data for the site was obtained from the Agricultural Research Council (ARC). The land type data is presented at a scale of 1:250 000 and entails the division of land types, typical terrain cross sections for the land type and the presentation of dominant soil types for each of the identified terrain units (in the cross section). The soil data is classified according to the Binomial System. The soil data was interpreted and re-classified according to the Taxonomic System (Land Type Survey Staff, 1972-2006).

The study site is situated in the Bb3 land type (Figure 12). The B land types represent a large proportion of the interior of South Africa and is made up of plinthic soils. Plinthic soils indicate a fluctuating water table. Hillslope catenas within these land types are represented by the soil forms Hutton, Bainsvlei, Avalon, and Longlands. Valley bottoms consisting of a gley soils such as the Katspruit soil form or Willowbrook, Rensburg or Champagne. In the Bb land types the plinthic

character of soils makes up more than 10% of the area.

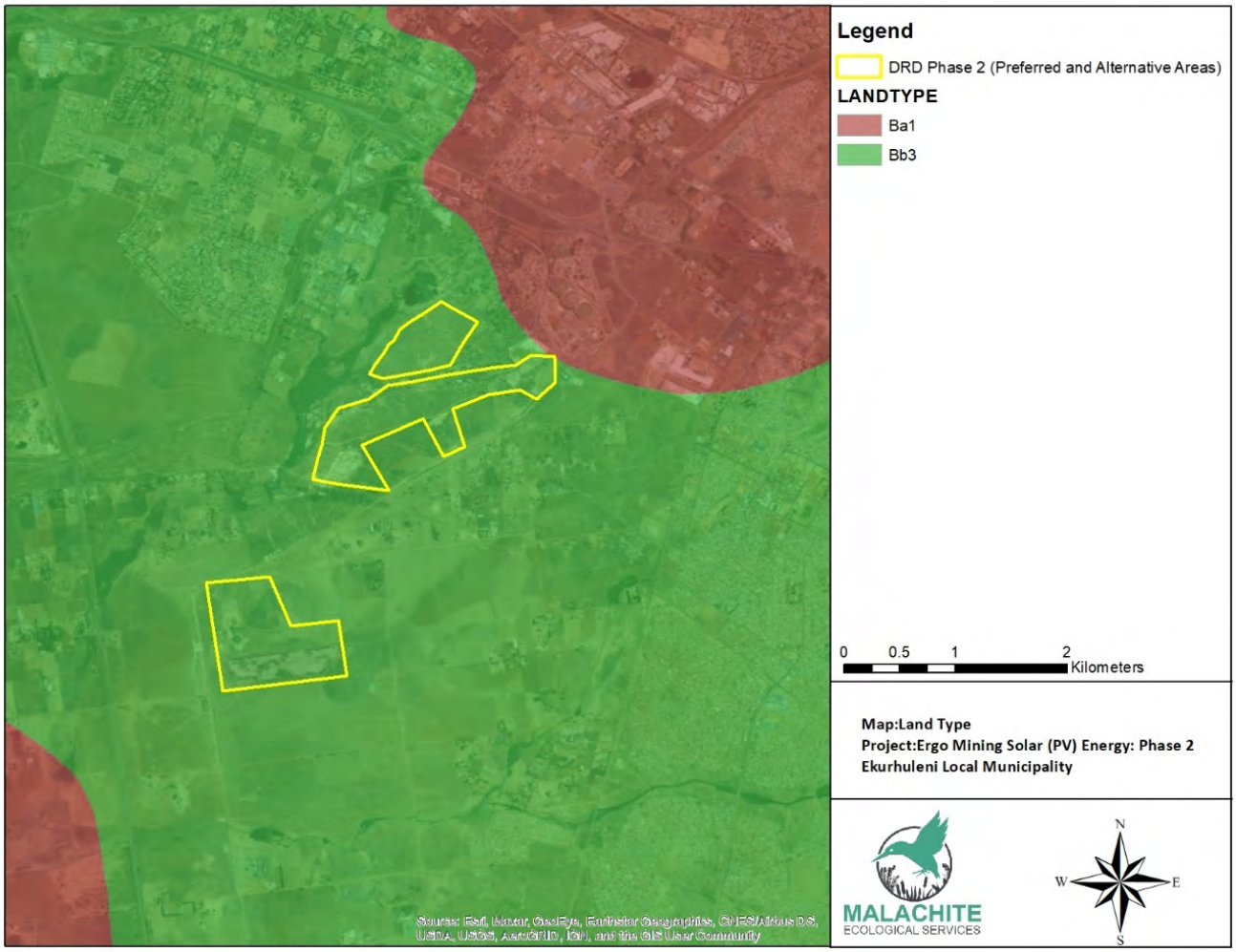


Figure 12: Land Type Data associated with the study site

Hydrology

(Refer to Appendix H)

Figure 13 presents the hydrological setting of the site. The hydrology of the region is characterised by a mixture of perennial and non-perennial watercourses. The site falls within the upper reaches of quaternary catchment C22C of which the primary watercourse is the Rietspruit River. Drainage at the site is generally in a south-westerly direction into a combination of non-perennial streams, dams, as well as formalised furrows and drainage canals as defined by the NGI's 1:50,000 topographical map sheets. These then flow into the Withokspruit and subsequently the Rietspruit River as illustrated in both Figure 2-1 and Figure 13, with the latter also including 100m buffers on surface water features including streams, dams, canals and furrows. (Refer to Appendix H).

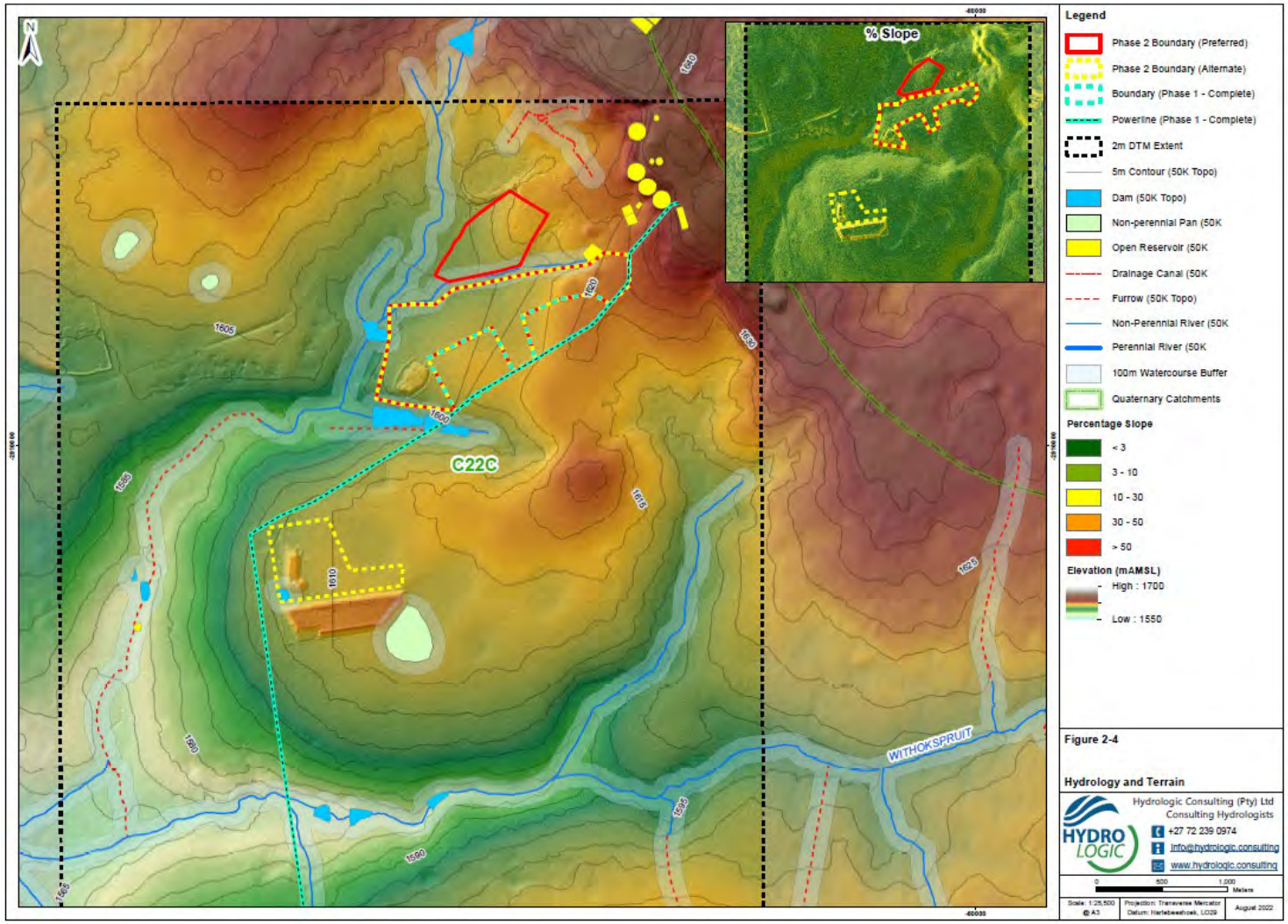


Figure 13: Hydrology and Terrain of the proposed site and surrounding areas

Catchment characteristics and watercourses

(Refer to Appendix I)

The project area lies within the Vaal Water Management Area. Major rivers within this WMA include the Wilge, Liebenbergsvlei, Mooi, Renoster, Vals, Sand, Vet, Harts, Molopo, and Vaal. These rivers experience significant levels of high-water demand related stress, particularly during drought seasons. Many of the surrounding communities rely on fresh water from these rivers throughout the year to supply adequate water for domestic use, stock and irrigation.

More specifically, the project area is situated within the C22C Quaternary Catchment (Figure 14). The Rietspruit flows approximately 2.7km to the west of the study site with a tributary of the Rietspruit flowing approximately 1.5km to the south of the study site. Non-perennial drainage channels are also located within the study site.

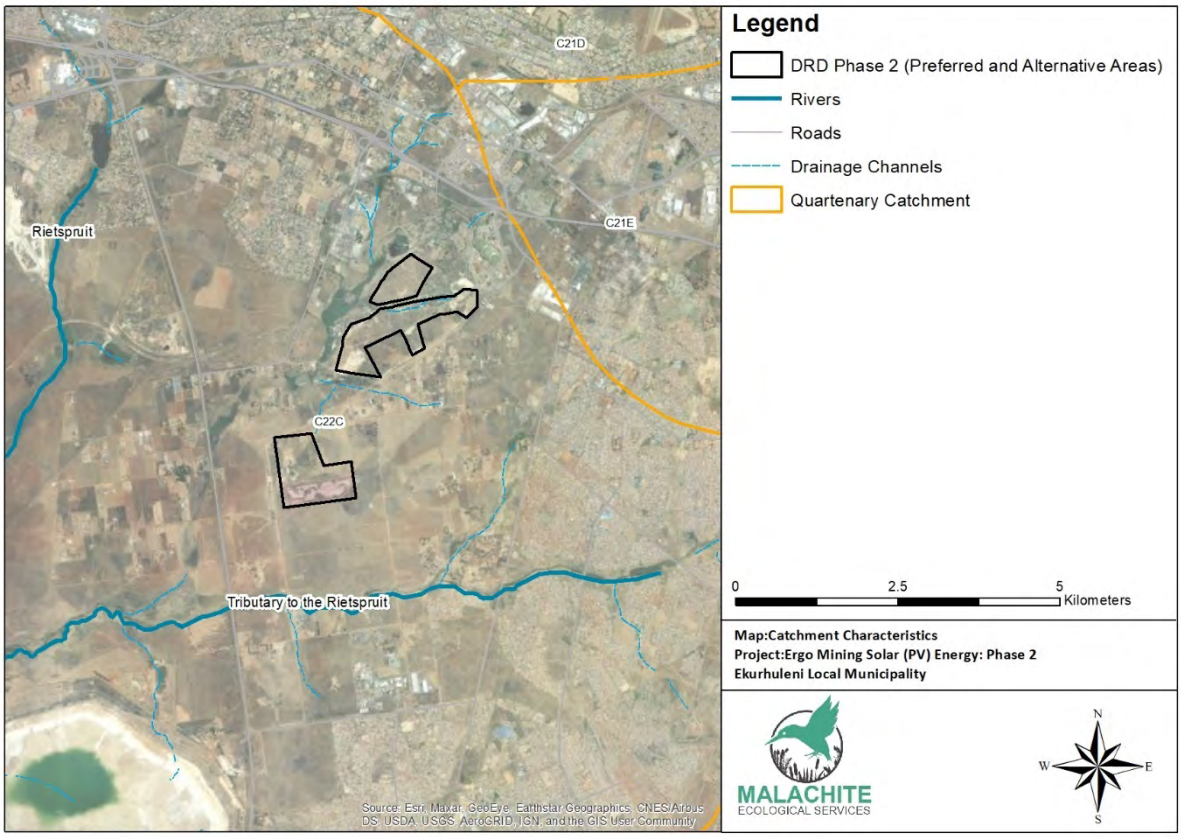


Figure 14: Quaternary catchments and river systems associated with the study area

National Freshwater Ecosystem Priority Areas (NFEPA) and the National Wetland Map 5

According to the outputs of the NFEPA project (Figure 15) a number of wetland systems are located within the assessment area, however these are not classified as FEPA wetlands. No FEPA wetlands are located within the assessment area or within the 500m regulated area. The wetlands are classified as an unchannelled valley bottom wetland, seep systems as well as depression and flat systems. These are furthermore classified as both natural and artificial, with the natural systems categorised as Moderately Modified.

As an additional database to the NFEPA database layer, the more recent National Wetland Map 5 (Van Deventer et al, 2018) database was furthermore utilised to assess the project area. The National Wetland Map 5 (NWM5) forms part of the National Biodiversity Assessment (2018), within the category of the Inland Aquatic (Freshwater) Realm. This project is a multi-partner project through the CSIR and SANBI. The NWM5 has significantly improved the representation of inland wetland ecosystem types. The representation of the extent of inland wetlands has improved by 123%, facilitating the reduction in the incorrect representation of terrestrial ecosystems as wetlands (Van Deventer et al, 2018).

The NWM5 was utilised to assess the project area. As shown in Figure 16 an unchannelled valley bottom wetland flows along the western and northern boundary of the larger study site, and a depression/pan is located on the south-eastern boundary of the alternative layout site. According to the National Biodiversity Assessment (2018) the unchannelled valley bottom is classified as Critically Endangered, and not protected. The depression is classified as Least Concern and not protected. Both system types are at a high risk to loss within the catchment area. The aim of investigating these wetland databases is to gain a general idea of where certain systems may be located. These wetlands were therefore delineated more accurately during the current field assessment.

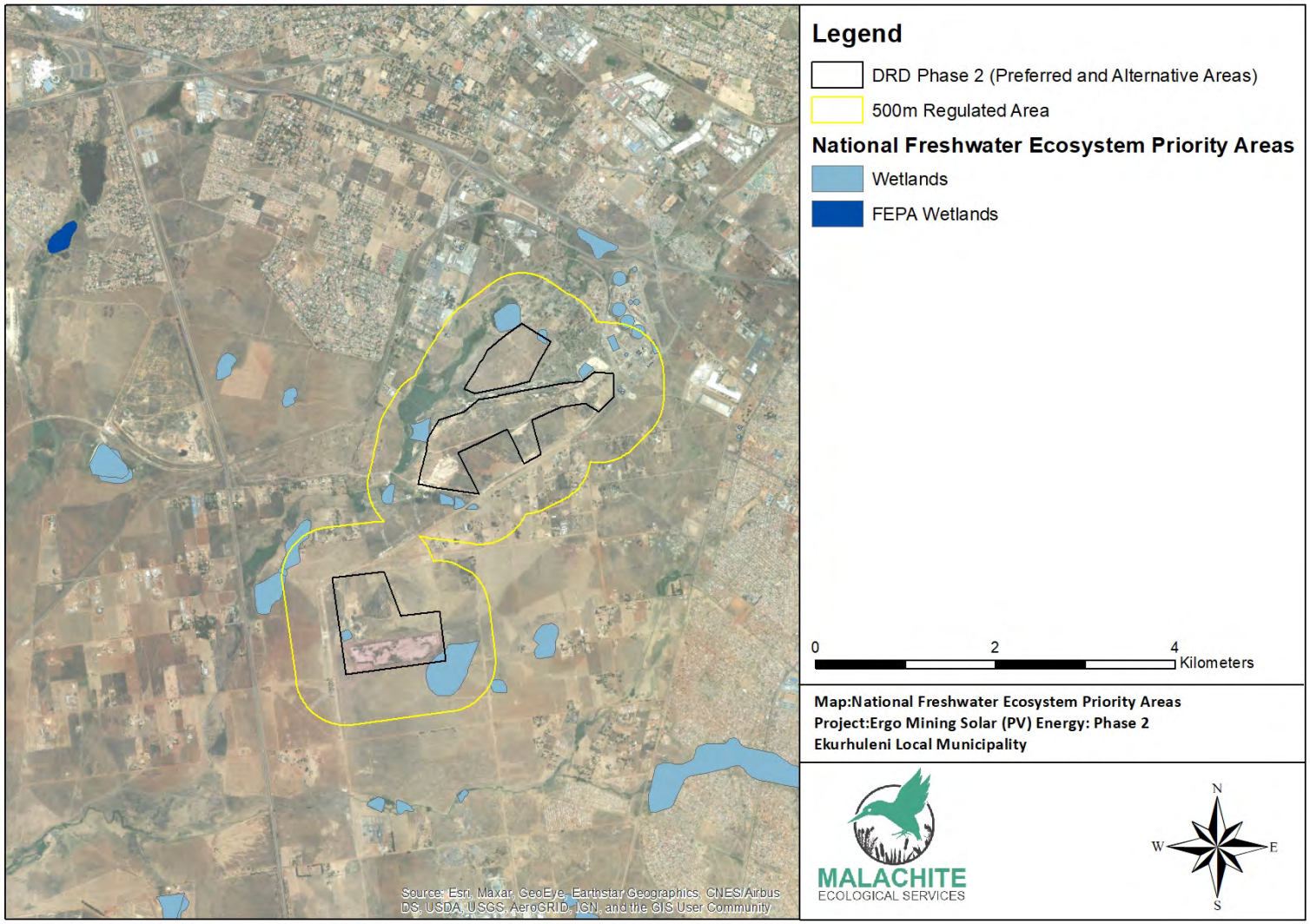


Figure 15: FEPA wetlands identified within the assessment area

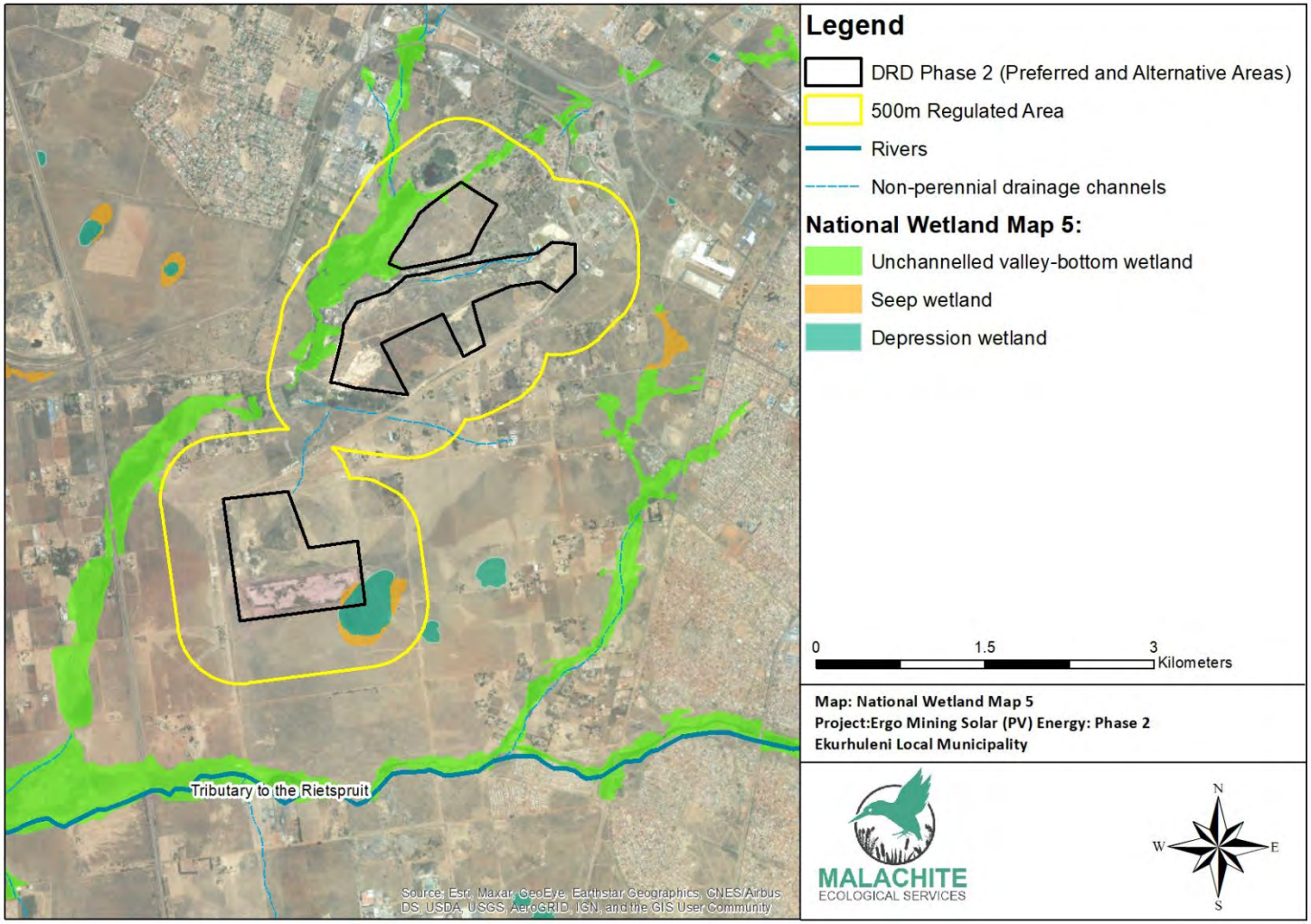


Figure 16: Wetland systems within the assessment area as per the National Wetland Map 5 database

Wetland Delineation

A thorough ground truthing delineation exercise was conducted following the desktop Scoping Assessment for this project. Based on the four wetland indicators identified on site, three HGM units were delineated in both the preferred and alternative layout sites as well as the 500m regulated area. HGM 1 was classified as an unchannelled valley bottom system, HGM 2 is classified as a seep, HGM 3 is classified as a depression. HGM 1 flows along the western edge of the preferred layout, HGM 2 was delineated within the 500m regulated area and a portion of HGM 3 was delineated at the south-eastern boundary of the alternative layout. The HGM units are detailed in Table 13 and displayed in Figure 17 to Figure 20.

Table 13: Summary table of delineated wetlands

HGM unit number	Wetland Type
HGM 1	Unchannelled Valley Bottom
HGM 2	Seep
HGM 3	Depression

Artificial Wetland systems

Apart from the three natural HGM units delineated within the study site and 500m assessment area, a number of artificial wetlands, functional dams, discarded dams, and seepage from dams were delineated. These wetland areas were identified both within phase 1 of the Ergo Gold PV project as well as during the current assessment.

During both phases of the Ergo Gold PV project, these areas were confirmed to be artificial in nature and have been created by the extensive anthropogenic modifications throughout the study site. As a result of these disturbances, the soils of the site have been completed modified and are now classified as the Hydric Technosol, Stilfontein form. These soils show signs of saturation but are not natural wetland soils. The artificial 'wetlands' were delineated during phase 1 of the Ergo Gold PV project based on the presence of hydric characteristics of the soil, at the surface of the soil profile or within the first 10cm. Similar 'wetland' areas were identified during the current assessment, within and adjacent to areas that have been extensively modified by historic and current mining activities and the subsequent rehabilitation of these areas. These artificial wetland areas are depicted in Figure 17 to Figure 20.

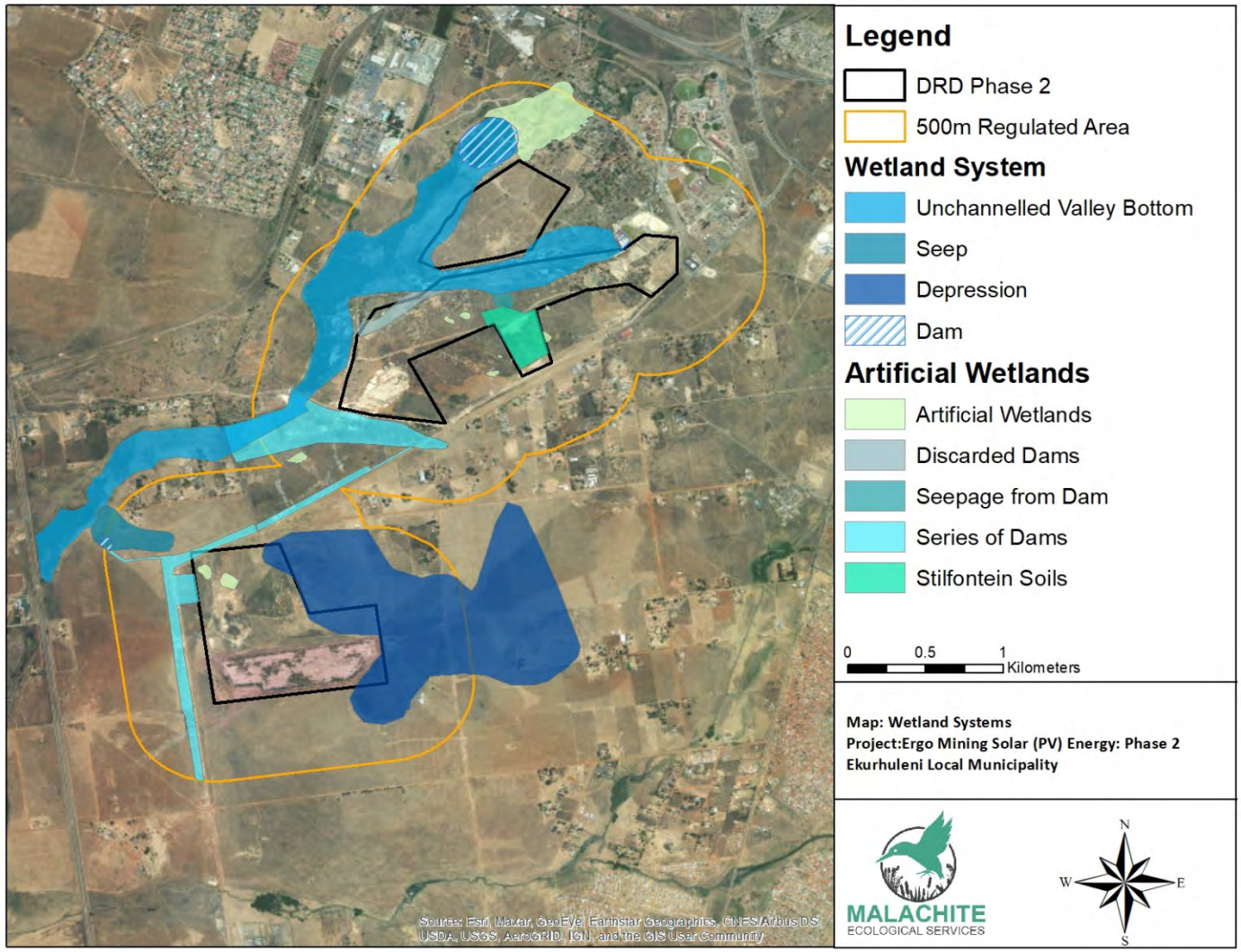


Figure 17: Wetland systems delineated within the assessment area

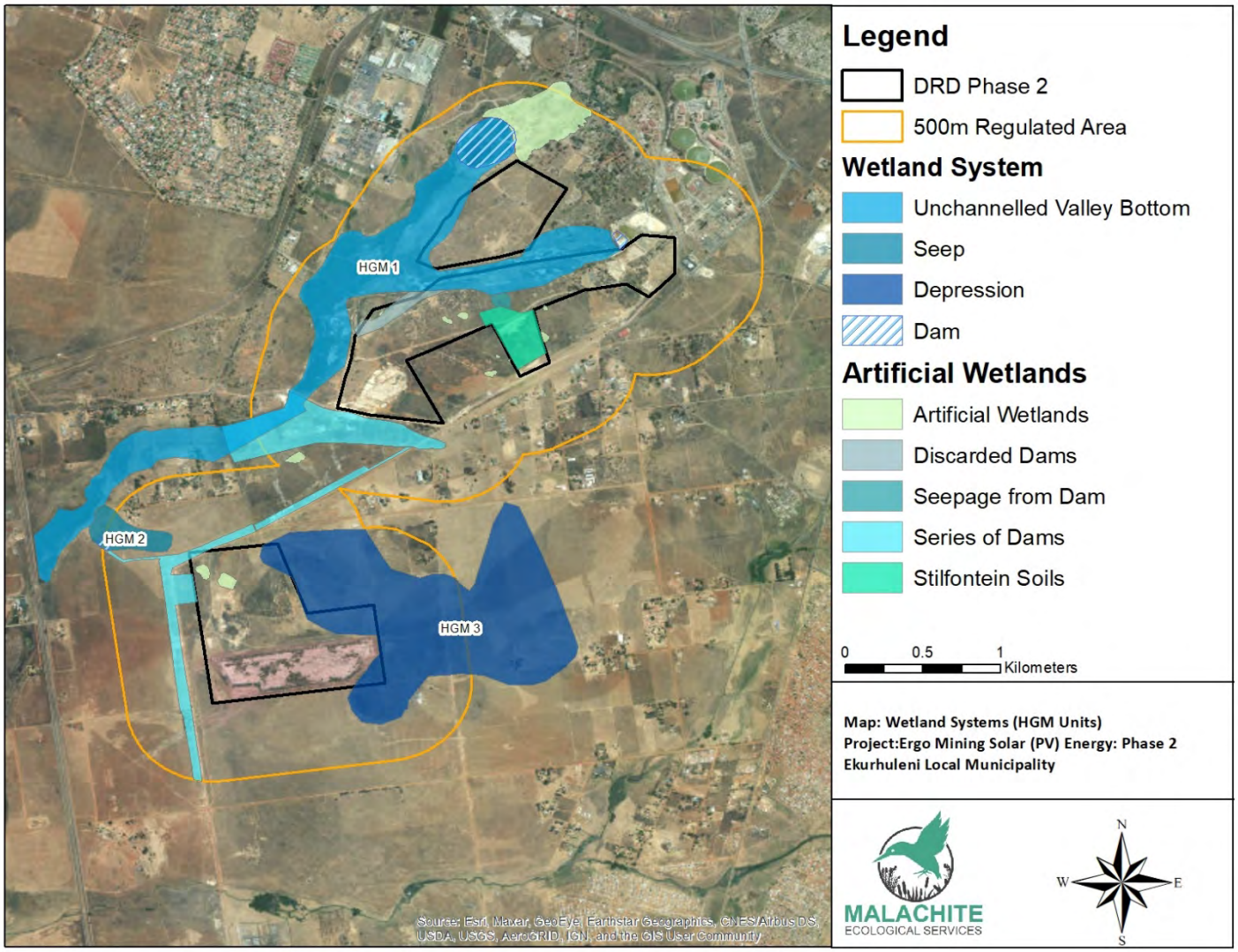


Figure 18: HGM units delineated within the assessment area

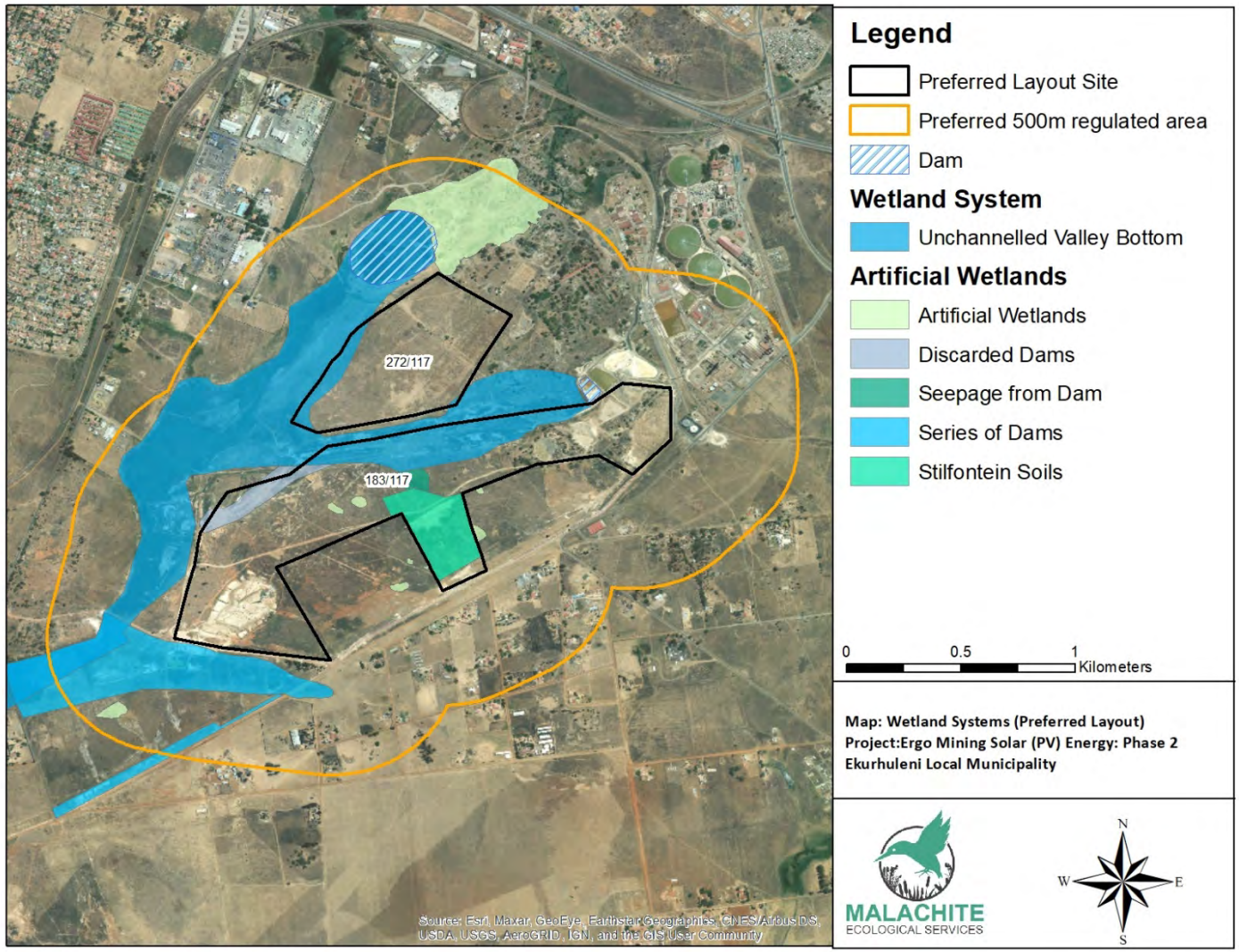


Figure 19: Closer view of the wetland systems delineated within the preferred layout site

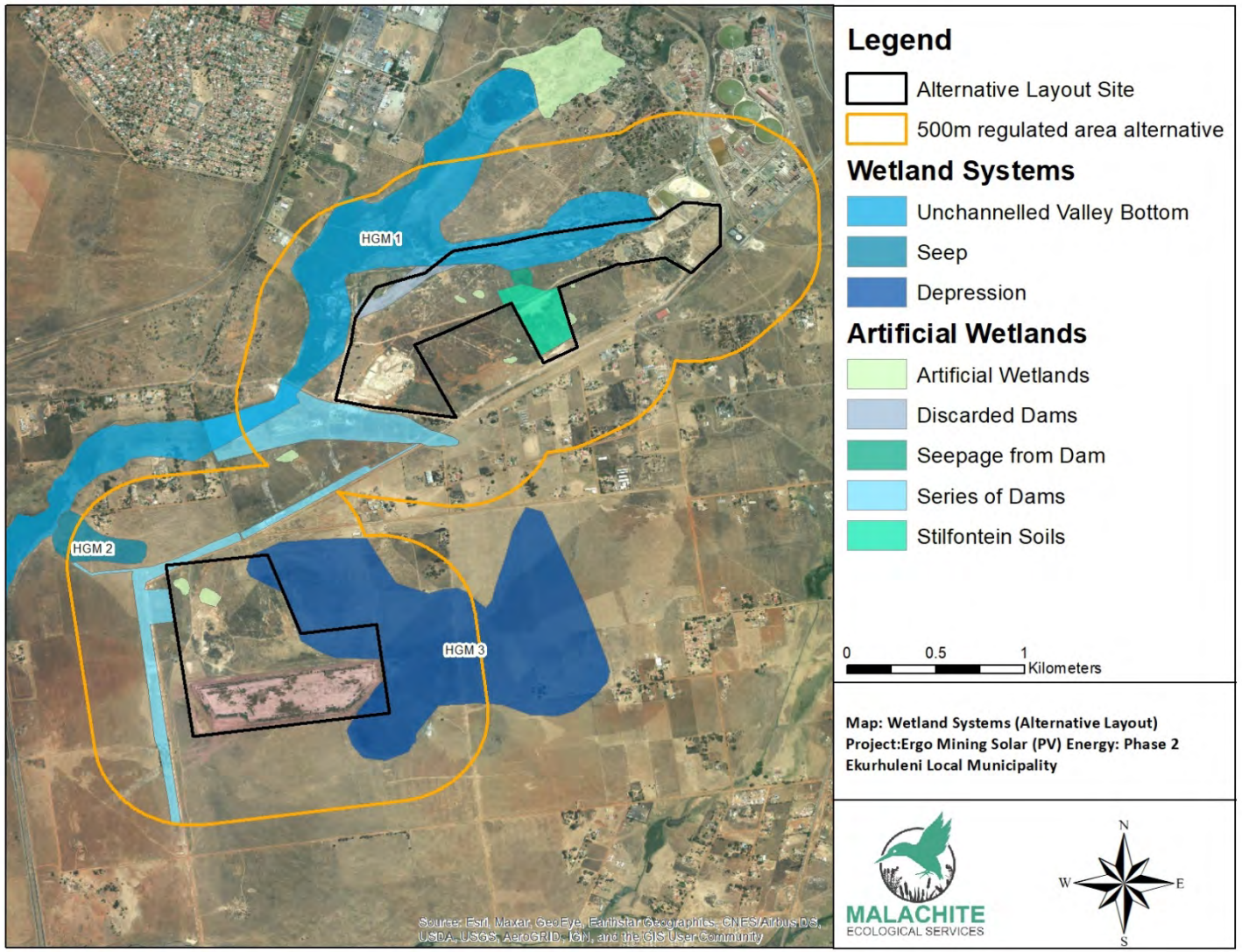


Figure 20: Closer view of the wetland systems delineated within the alternative layout site

Present Ecological State (PES): Wetland assessment

The three natural HGM units were assessed with regards to their health according to the Wet-Health methodology[9]. A level 2 assessment (detailed) was conducted. HGM 1, the unchannelled valley bottom wetland, was classified as Seriously Modified (PES Category E) (Figure 21), HGM 2, the seep system has been classified as Largely Modified (PES Category D) (Figure 22), and HGM 3, the depression system has been classified as Moderately Modified (PES Category C) (Figure 23).

Impacts to the wetland systems stem from the use of the catchments associated with each wetland for historic and current mining activities as well as urban development. These developments have impacted the hydrological flow of the wetlands as well as the geomorphic setting. HGM 1 has been particularly disturbed as a result of mining within the catchment. This wetland has been dammed during historic mining within the area and while much has been rehabilitated through the decommissioning of the dams, the wetland remains seriously impacted. The existing Ergo Gold Mine Brakpan Plant is situated within the catchment of this HGM unit, with tailings facilities in the upper reaches of the valley bottom wetland. These have had a serious impact on the flow dynamics of the wetland, leading to erosion, desiccation, and encroachment of alien invasive species.

An earthen dam associated with HGM 2, the seep wetland, has also had an impact on the flow dynamics of this system. The damming of wetland systems has long-term negative impacts on the hydrology, geomorphology, and vegetation dynamics of these systems. Dams cause a decrease in the quantity of water reaching downstream wetland areas as well as the increase in flooding of the upstream wetland systems, leading to changes in the hydrological flow through the channels as surface flow and through the soil profile as subsurface flow. Further to this, impoundments act as sediment sinks, reducing the sediment load of water released downstream of the dam. This results in water that is regarded as 'sediment hungry', having an increased capacity for erosion.

The depression wetland, HGM 3, is an extensive system that is situated both within a portion of the alternative layout (Ptn 9/131) as well as to the east of the study site. Despite the large size of the depression system, it has a smaller catchment area, compared to the other two HGM units and this has limited the impacts to this wetland to a degree. The depression system has still been impacted through the use of the adjacent area as a tailing's storage facility, crop cultivation, low density housing and the construction of dirt roads through the system. Sediment deposition from this anthropogenic activities has been within areas of the depression, affecting the hydrology, geomorphology, and vegetation dynamics of the system. A general desiccation of the wetland is apparent in the series of aerial imagery from 1985 to 2022.

A summary of the PES scores obtained for the delineated systems following application of the Wet-Health approach is provided in Table 14.

[9] The current size of the delineated wetlands was recorded. It must be noted that this is not the entire size of the wetland but rather the portion of the system delineated within the assessment area.

Table 14: Summary of PES score

HGM Unit	Extent Delineated (Ha)	Hydrology	Geomorphology	Water Quality	Vegetation	PES Score (Category)
HGM 1	117.40	6.5	5.0	7.5	7.5	E (6.6)
HGM 2	8.33	5.2	3.8	3.4	5.5	D (4.50)
HGM 3	128.66	3.5	2.5	5.5	2.7	C (3.50)

Figure 21: Portions of HGM 1 showing the impacted nature of this system as well as the lack of flowing water

Figure 22: Portions of HGM 2, the seep system located within the 500m assessment area

Figure 23: Portions of the large depression system, HGM 3, delineated in the south-western extent of the alternative layout

Functional Assessment (Ecosystem Goods and Services)

Ecosystem goods and services were calculated for the HGM units (Figure 24). All HGM units received generally low to moderate scores for the ecosystem services. Highest scores received were associated with flood attenuation (particularly for HGM 1), streamflow regulation, erosion control, sediment trapping and filtration (in the form of nitrate, phosphate, and toxicant trapping). The depression wetland, (HGM 3) received higher scores for the maintenance of biodiversity due mainly to its large size and the presence of open water. The system also provides sediment control and filtration functions.

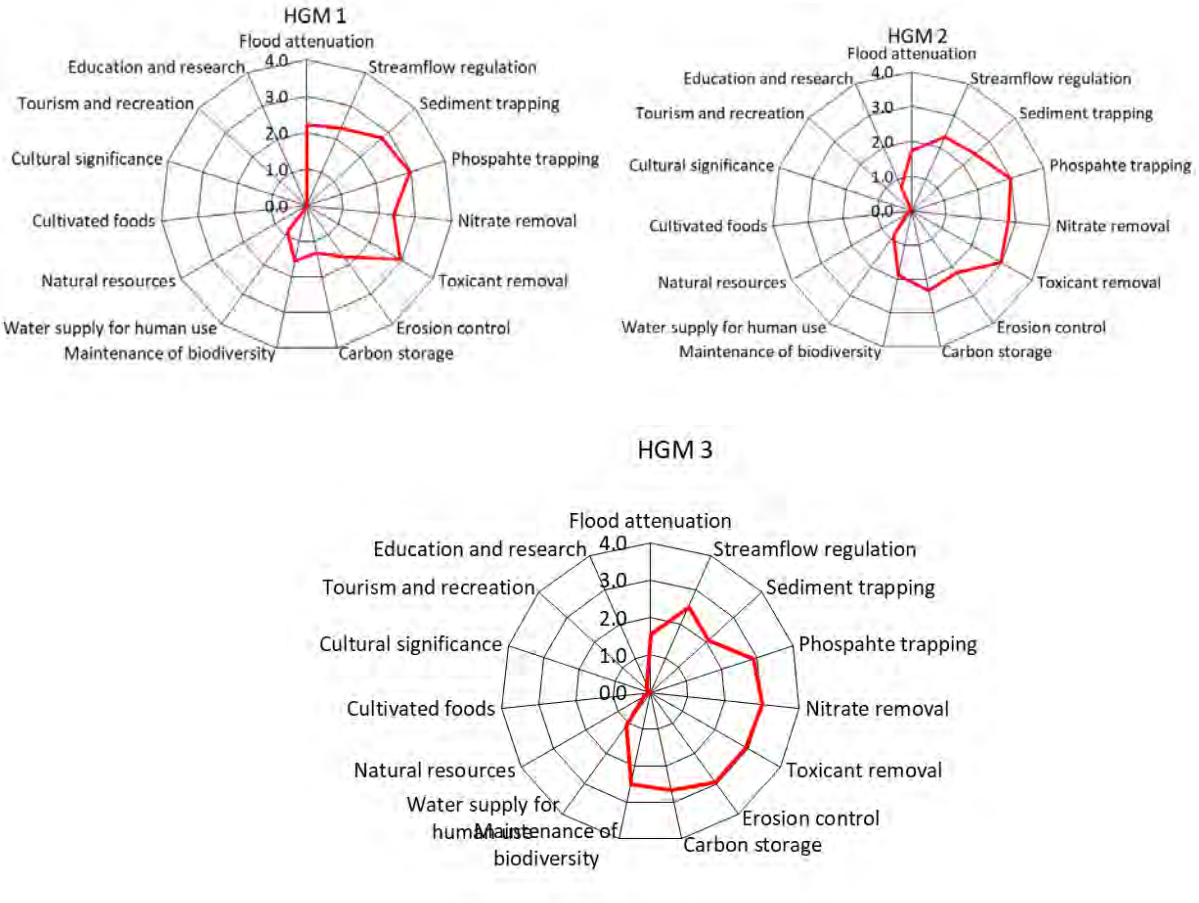


Figure 24: Results of the WET-EcoServices assessments for all HGM units

The EIS scores received for all HGM units was Low[10] (Table 15). The location of the wetlands within an urban landscape that has been largely disturbed limits the ability of the wetlands to provide suitable habitat for faunal and floral species. The depression wetland (HGM 3) received a higher score as a result of the presence of open water within this system which provides habitat for semi-aquatic and aquatic species. All systems received Moderate scores for the Hydrological Functional Importance, and this supports the scores received in the Present Ecological State scores as well as the Wet-Ecosystem services scores. The systems provide numerous ecological services to the surrounding community as well as their catchments. Socio-economic importance of the wetlands is low and is limited to grazing for livestock as well as the presence of dams in some of the systems.

Table 15: Summary of the Ecological Importance and Sensitivity

HGM Unit	EIS	Score (0-4)	Confidence (0-5)	Category
HGM 1	Ecological Importance and Sensitivity	1.47	4	Low
	Hydrological Functional Importance	2.34	4	Moderate
	Direct Human Benefits	0.67	4	Very Low
HGM 2	Ecological Importance and Sensitivity	1.54	4	Low
	Hydrological Functional Importance	2.47	4	Moderate
	Direct Human Benefits	0.67	4	Very Low
HGM 3	Ecological Importance and Sensitivity	1.87	4	Low
	Hydrological Functional Importance	2.94	4	Moderate
	Direct Human Benefits	1.33	4	Low

Aquatic Habitat

(Refer to Appendix I)

In general, a low diversity of aquatic habitats is expected within HGM 1 due to the unchanneled valley-bottom wetland nature as well as the underlying geology which has resulted in a notable lack of stones habitat. Further, HGM 1 has a relatively small, low-gradient catchment and thus a low accumulation of flow, resulting in slow-flowing hydraulic habitat.

[10] A low score indicates that features about the wetland are regarded as somewhat ecologically important and sensitive at a local scale. The functioning and/or biodiversity features have low-medium sensitivity to anthropogenic disturbances. They typically play a very small role in providing ecological services at the local scale.

Consequently, the aquatic habitat within HGM 1 comprises of dense stands of emergent vegetation of *Phragmites* sp. and *Typha capensis* with slow-flowing water and a mud-based substrate. The physico-chemical properties of HGM 1 are further likely to present a limiting factor to the occurrence of aquatic biota within the wetland.

Aquatic habitat within HGM 3 (depression wetland) is also limited, as standing water is only present during the rainfall season and emergent vegetation is the dominant habitat structure. However, the shallow depth and lack of flowing water as well as possible water quality impairment from seepage of contaminated water from the tailing's storage facility located within the wetland's boundary present limiting factors to the occurrence of diverse aquatic biota.

Aquatic Macroinvertebrates

In general, valley bottom wetlands (particularly unchannelled valley bottom wetlands) and depressional systems are unlikely to support a diverse array of aquatic biota during even unimpacted conditions given the lack of diverse hydraulic habitat relative to true riverine reaches of watercourses, as well as the often-limited volume of surface water present in such systems. Accordingly, given the water quality of the generally reducing environmental conditions associated with wetlands and the possible impacts from historic gold mining activities within the area, as well as hydrological dynamics of such systems and the lack of diverse habitat, the aquatic macroinvertebrate assemblage is dominated by taxa with a strong preference for instream and emergent vegetation within very slow-flowing habitats, as well as taxa with a very low to low preference for unmodified water quality. As such, only a limited acquired diversity of aquatic biota is associated with the wetlands present within the study area.

On the other hand, the intrinsic aquatic macroinvertebrate diversity associated with a depressional system such as HGM 3 is largely based on the egg bank which is supported by such a system, as well as the extent and duration of inundation at any given time. Variability in terms of the total number of hatched nauplii and the temporal variability of the hatching from depressional systems is expected, as successful hatching is a function of conditions of exposure, the species present and the fraction of quiescent and diapausing eggs (Henri et al., 2014). Branchiopod eggs have been found to exhibit different states of dormancy. Diapause is one state of dormancy where the arrest in development is initiated by internal factors - eggs do not hatch even when environmental conditions are favourable as diapause termination is also internally controlled (Lavens & Sorgeloos, 1987; Drinkwater & Clegg, 1991; Brendonck et al., 1993; cited in Henri et al. 2014). Quiescence is an alternate state of dormancy where the arrest in development is initiated by external factors, is induced by unfavourable external conditions, and is terminated as soon as conditions are permissible (Lavens & Sorgeloos, 1987; Drinkwater & Clegg, 1991; Brendonck, 1996; cited in Henri et al. 2014). Both forms of dormancy have been found to occur in a single brood of eggs. Quiescent eggs respond rapidly to a change in environmental conditions giving species a quick start to colonisation before the pan dries up (Brendonck, 1996; cited in Henri et al. 2014). Diapause is most likely the phenomenon which ensures some eggs always remain dormant in the sediment to ensure the continuation of the species over long periods of time and is most likely responsible for the long-term viability of eggs in the egg bank.

Hatching of individuals is also known to vary under identical conditions and only a fraction of the total viable egg banks are likely to hatch during the inundation period (Brendonck et al., 1996; Vanderkerkhove et al., 2004; cited in Henri et al., 2014). According to Henri et al. (2014), a temporal succession in the diversity of invertebrates was noted during the hatching period following inundation, and the rate of nauplii hatching therefore appeared to be related to the diversity of the egg bank, with pans that had a peak in hatching within the 4-16 day interval having an abundance of Anostraca, while those pans where hatching peaked in the 16-18 day interval had high numbers of Cladocera and Ostracoda.

However, the impacts of mine-affected water on HGM 3 are likely to significantly decrease the intrinsic biodiversity features associated with the wetlands. According to studies conducted by Henri et al. (2014), mine-affected water in the form of Acid Mine Drainage had a negative effect on the hatching success from egg banks of depressional wetlands systems within the Highveld region. Furthermore, such impacted depressional wetlands had lower recovery rates, suggesting that such wetlands will suffer a loss of biodiversity.

Ichthyofauna

A total of four indigenous fish species and one alien fish species are expected to be associated with the larger study area (Table 16). Such diversity may however be considered optimistic, and only limited fish diversity is expected to be associated with HGM 1 (if any), while no fish species are expected to be associated with HGM 3.

Table 16: Fish species expected to be associated with the study area

Scientific Name	Common Name	Conservation Status
Indigenous species		
Clarias gariepinus	Sharptooth Catfish	Least Concern
Enteromius cf. anoplus	Chubbyhead Barb	Least Concern
Enteromius cf. pallidus	Goldie Barb	Least Concern
Tilapia sparrmanii	Banded Tilapia	Least Concern
Non-native Species		
Gambusia affinus	Mosquitofish	Alien

It should be noted that there are current taxonomic uncertainties with several species of fish expected to occur within the larger study area which may have implications on assigned conservation status. These include:

- *Enteromius cf. anoplus* (Chubbyhead Barb complex). Genetic studies done on the Chubbyhead Barb complex by Da Costa (2012) suggested this group to have significant genetic variation and to represent multiple potential species. The study by Da Costa (2012) showed the separation of the complex into distinct lineages, with the species likely to occur within the present study area corresponding with Lineage A which represents the largest of the lineages identified. Four sub-groups were observed within Lineage A by Da Costa (2012), with those specimens present within the Upper Vaal catchments corresponding to sub-group 1, again the largest of the sub-groups identified. Nevertheless, if further taxonomic studies confirm that there are separate species, the assessment as Least Concern may need revision in some cases.
- *Enteromius cf. pallidus* (Goldie Barb). According to Chakona et al. (2015), genetic analyses of *Enteromius pallidus* collected from the currently known distribution range of the species within South Africa grouped into two distinct lineages,

namely a southern lineage from where the original type specimen was collected, and a northern lineage. Further, the deep genetic divergence between the northern and southern lineages of *E. pallidus* suggests a long history of isolation, raising two taxonomic possibilities: The first possibility is that the northern lineage of *E. pallidus* may represent an undescribed species. A second possibility is that the 'true' *E. pallidus* is confined to coastal rivers of the Eastern Cape, and the northern lineage belongs to a different, but known species or species complex. However, further research is required to resolve this taxonomic uncertainty between the two genetically distinct lineages to determine implications on conservation priorities.

Present Ecological State: Aquatic

Based on the nature of the watercourses associated with the study area, determination of the ecological state from an aquatic perspective is not considered suitable. Reliance should therefore be placed on that as determined from a wetland perspective.

Ecological Importance and Sensitivity: Aquatic

As with the determination of the ecological state, determination of the ecological importance and ecological sensitivity of HGM 1 and HGM 3 from an aquatic perspective is not considered suitable. Reliance should therefore be placed on that as determined from a wetland perspective.

Vegetation Type Overview

(Refer to Appendix E)

The study site is situated within the Grassland Biome of South Africa. This biome is dominated by grasslands wherein high summer rainfall, combined with dry winters, night frost and marked diurnal temperature variations are unfavourable to tree growth. Most plant species in grasslands are non-grassy herbs (forbs), most of which are perennial plants with large underground storage structures. Furthermore, many Rare and Threatened plant species in the summer rainfall regions of South Africa are restricted to high-rainfall grasslands, making the Grassland Biome in most urgent need of conservation.

The Grassland Biome comprises several vegetation types (Mucina & Rutherford, 2006). Most of the proposed sites are situated within the historical extent of the Tsakane Clay Grassland that occurs on slightly undulating plains and low hills (Figure 25). The vegetation is short, dense grassland dominated by a mixture of common highveld grasses such as *Themeda triandra, Heteropogon contortus, Elionurus muticus* and several *Eragrostis* species. Disturbance leads to an increase in the abundance of the grasses *Hyparrhenia hirta* and *Eragrostis chloromelas* (Mucina & Rutherford, 2006). Only about 2% of the 24% target of this grassland is conserved and it is classified as Endangered (Mucina & Rutherford, 2006). More than 60% was transformed by cultivation, urbanisation, mining, dam-building and roads and urbanisation is threatening the remaining portions of this grassland. The most eastern extent of the Preferred sites encroaches into the Soweto Highveld Grassland. This vegetation type is also greatly transformed and classified as being Endangered. The vegetation grows on gently to moderately undulating landscapes of the Highveld Plateau and supports short to medium-high, dense, tufted grassland, dominated by a variety of grasses, mainly *Themeda triandra*

Listed Ecosystems

The South African Biodiversity Act (Act 10 of 2004) provides for the listing of threatened or protected ecosystems. These ecosystems are grouped into Critically Endangered-, Endangered-, Vulnerable- and Protected Ecosystems (Section 52(1)(a) of the National Environmental Management: Biodiversity Act (Government Gazette 34809, Government Notice 1002, and 9 December 2011)).

Most of the proposed sites fall within the Critically Endangered Klipriver Highveld Grassland ecosystem, whereas the eastern extent thereof falls partly within Soweto Highveld Grassland (Vulnerable), and the Tsakane Clay Grassland (Endangered) listed ecosystems (Figure 26). Google Earth satellite imagery show that much of the development footprint traverse areas that have already been modified from the natural state.

Although the National List of Threatened Terrestrial Ecosystems published in terms of the Biodiversity Act in 2011 remains in legal force, the data contained in the recent National Biodiversity Assessment (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 and therefore the gazetted 2011 Listed Ecosystems is still in force. The updated threatened ecosystems as per the recent NBA (2018) places portions of the site and surrounds within the Endangered Tsakana Grassland (Figure 27).

Gauteng Conservation Plan

The Gauteng Conservation Plan (Version 3.3) (GDARD, 2011) classified areas within the province based on its contribution to reach the conservation targets within the province. These areas are grouped as Critical Biodiversity Areas (CBAs) or Ecological Support Corridors (ESAs). The CBAs comprise 'Irreplaceable' areas that must be conserved and areas classified as 'Important' to reach the conservation targets of the Province. ESA's are areas that are not essential for meeting biodiversity representation targets/thresholds but which nevertheless play an important role in supporting the ecological functioning of critical biodiversity areas and/or in delivering ecosystem services that support socio-economic development, such as water provision, flood mitigation or carbon sequestration. ESAs ensure sustainability in the long term.

Large portions of the proposed site are not classified as being of conservation concern. However, Critical Biodiversity Areas (CBAs) classified as Important to reach the conservation targets in the Province are present around the sites (Figure 28). The CBAs indicate areas that likely comprise primary vegetation and could be suitable habitat for plant species of conservation concern. The ESAs present on the site are associated with the Withokspruit tributaries and drainage lines on and around the site.

Table 17 summarises results of the assessment as per the main requirements of the Protocols for Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial (Vegetation) Biodiversity as published on 20 March 2020.

Table 17: Summary of the main terrestrial (vegetation) biodiversity findings

Biodiversity (vegetation) aspect	Result
Conservation Plan Category: CBA and ESA	Reason for the CBA The CBAs within and around the proposed sites are classified based on the potential habitat for plant species of conservation concern and the potential presence of primary vegetation Can ESA / CBA be maintained? The ESA on both sites correspond with secondary grasslands. The vegetation within the CBA on the Preferred site was historically cultivated, currently comprise secondary grassland and no plant species of conservation concern were recorded or are expected to be present. The CBA on the sites functions rather as an ESA and if movement corridors along the Withokspruit and moist grasslands remain undeveloped, then the function can be maintained. Impact on species composition and structure of vegetation Areas that will be developed are proposed to be contained within the existing secondary and modified vegetation. If mitigation is implemented no natural to semi-natural grasslands will be affected.
Ecosystem threat status	Impact on ecosystem threat status No natural of good condition vegetation is present within the Preferred- or Alternative sites. The vegetation is not representative of Tskane Clay Grassland and therefore can not contribute to the conservation thereof. The remnant Tsakane Clay Grassland around the site boundaries are also in a secondary to highly degraded state and the impact of the proposed development on the threat status of this ecosystem is negligible. Impact on explicit subtypes in the vegetation; and the impact on overall species and ecosystem diversity of the site; See above
Protected Areas	• Not applicable
Strategic Water Source Areas (SWSA):	Impact(s) on the terrestrial habitat of a SWSA The site is not situated within a SWSA, however clearing of vegetation can have an impact on water infiltration and flow dynamics to the moist grassland and downstream watercourses. Impacts of the proposed development on the SWSA water quality and quantity Erosion, sedimentation and pollution caused by clearing of vegetation for the development, could impact on the downstream water quality temporarily (e.g. during construction). Once indigenous vegetation has re-established or recovered, the impact will be negligible, provided that impermeable surfaces are limited, and no runoff water are directed towards the moist grassland
National Freshwater Ecosystems Priority Areas (NFEPA):	See wetland assessment

Biodiversity (vegetation) aspect	Result
Indigenous forest	Not applicable
Sensitive Areas	• The buffer area to the moist grasslands, as delineated by the wetland specialist must be avoided. • As per the GDARD Requirements for Biodiversity Assessments Version 2 (2012): "All good condition natural vegetation must be designated as ecologically sensitive". Rocky grassland to the southwest of the Preferred site and the north of the Alternative site may be in a good ecological condition and falls within a CBA that forms part of a Critically Endangered Ecosystem. This area is outside of the PAOI and may not be considered for any development or edge effects.
No go areas	Avoid direct impacts to moist grasslands and no edge effects or scope creep towards rocky grasslands outside of the PAOI are allowed.
Plant species of conservation concern	• No plant species of conservation concern were recorded or are expected to be present
Main impacts:	The main impacts expected are as follows: • Destruction of natural vegetation of medium sensitivity (rocky- and moist grassland) • Destruction of modified vegetation of low sensitivity • Exposure to erosion and subsequent sedimentation or pollution of proximate moist grassland (watercourse) • Unlikely destruction of protected plants and plants of conservation concern • Potential increase in invasive vegetation • Compaction and destruction of soils
Cumulative impacts:	• If mitigation measures are adequately implemented, no cumulative impacts are expected.
Residual impacts:	• Trampling and edge effects; and • Impacts to the watercourse such as runoff from roads.

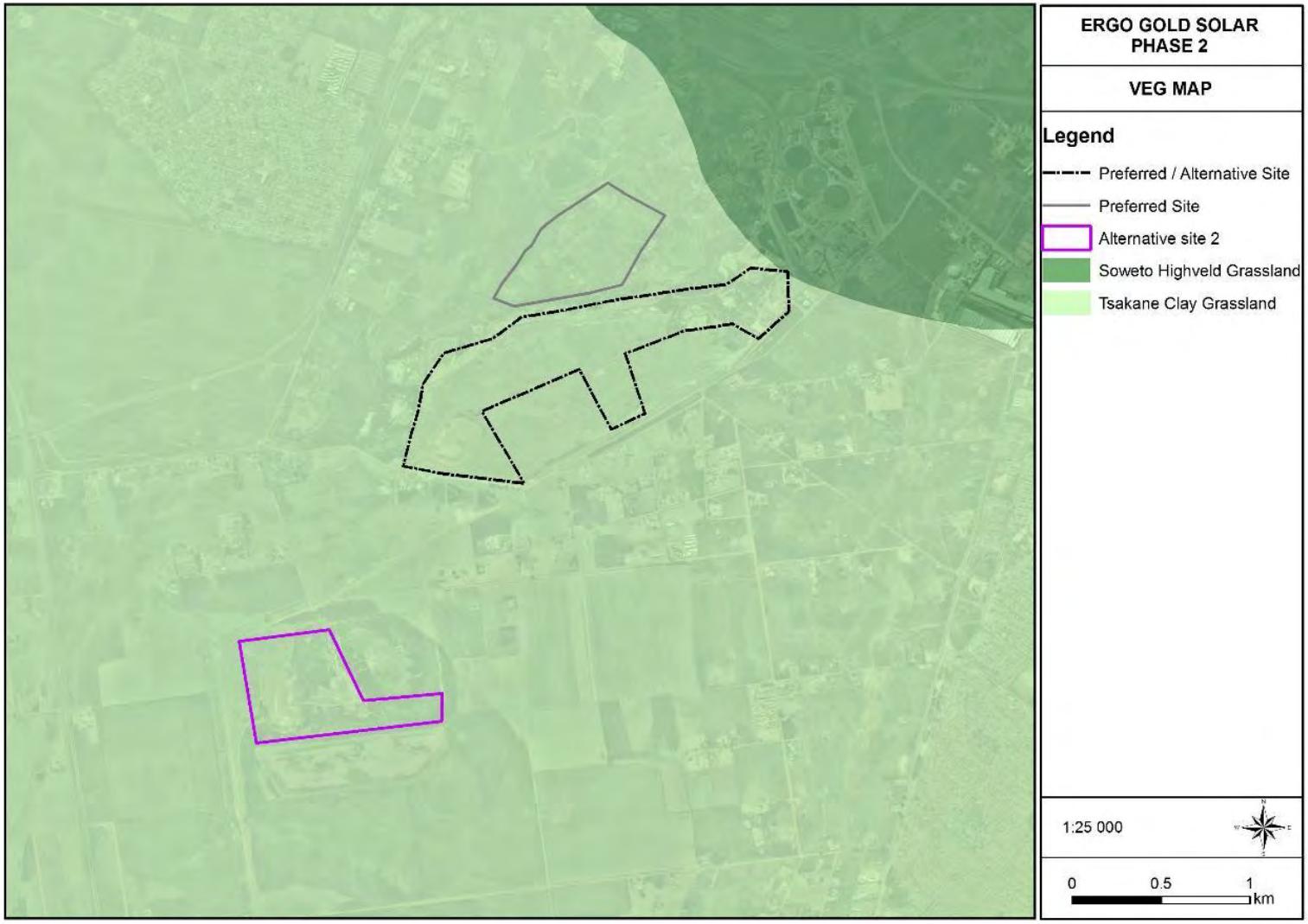


Figure 25: Vegetation units underlying the study area (Mucina and Rutherford, 2006).

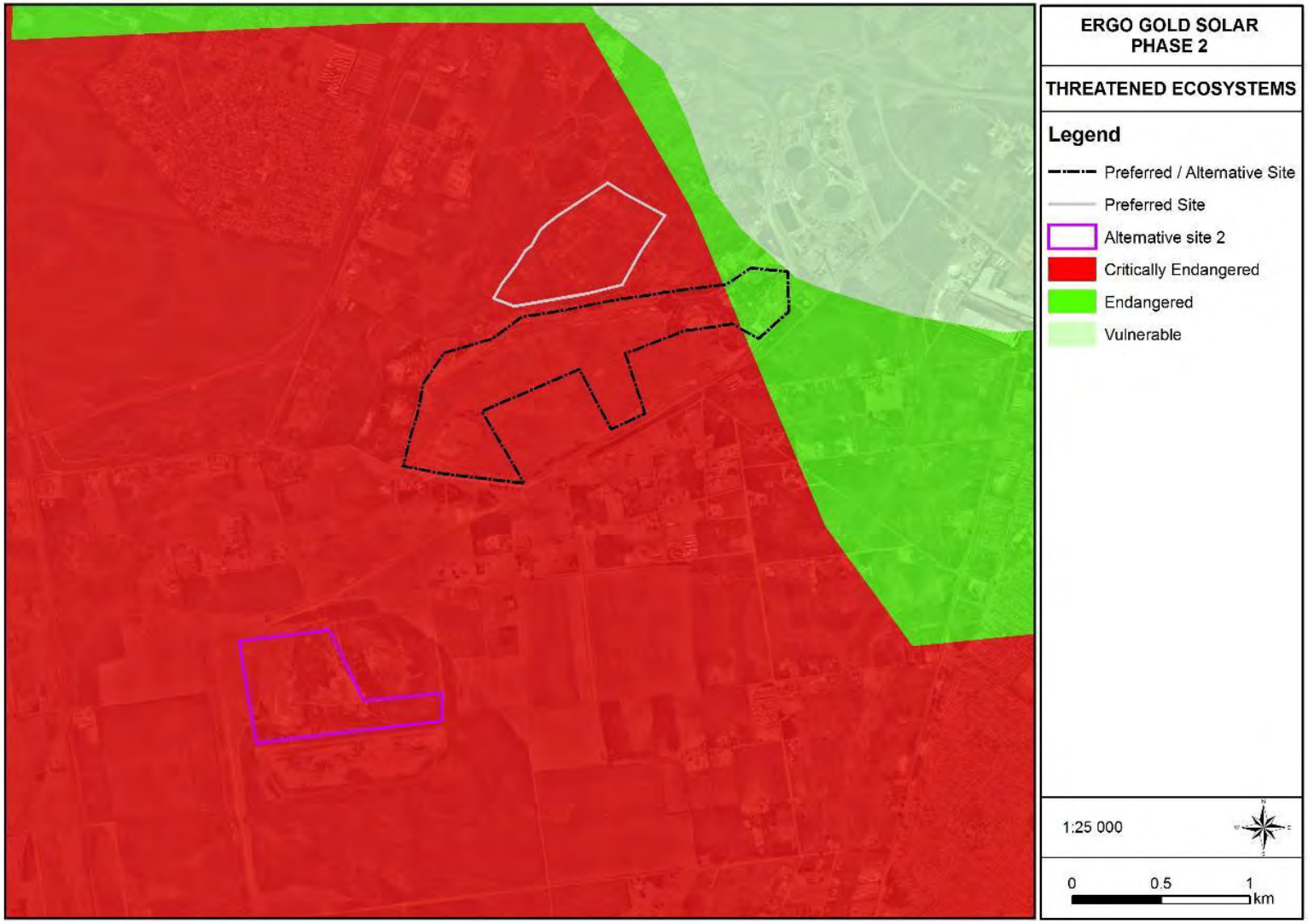


Figure 26: Threatened ecosystems (Government Gazette 34809, Government Notice 1002, and 9 December 2011)).

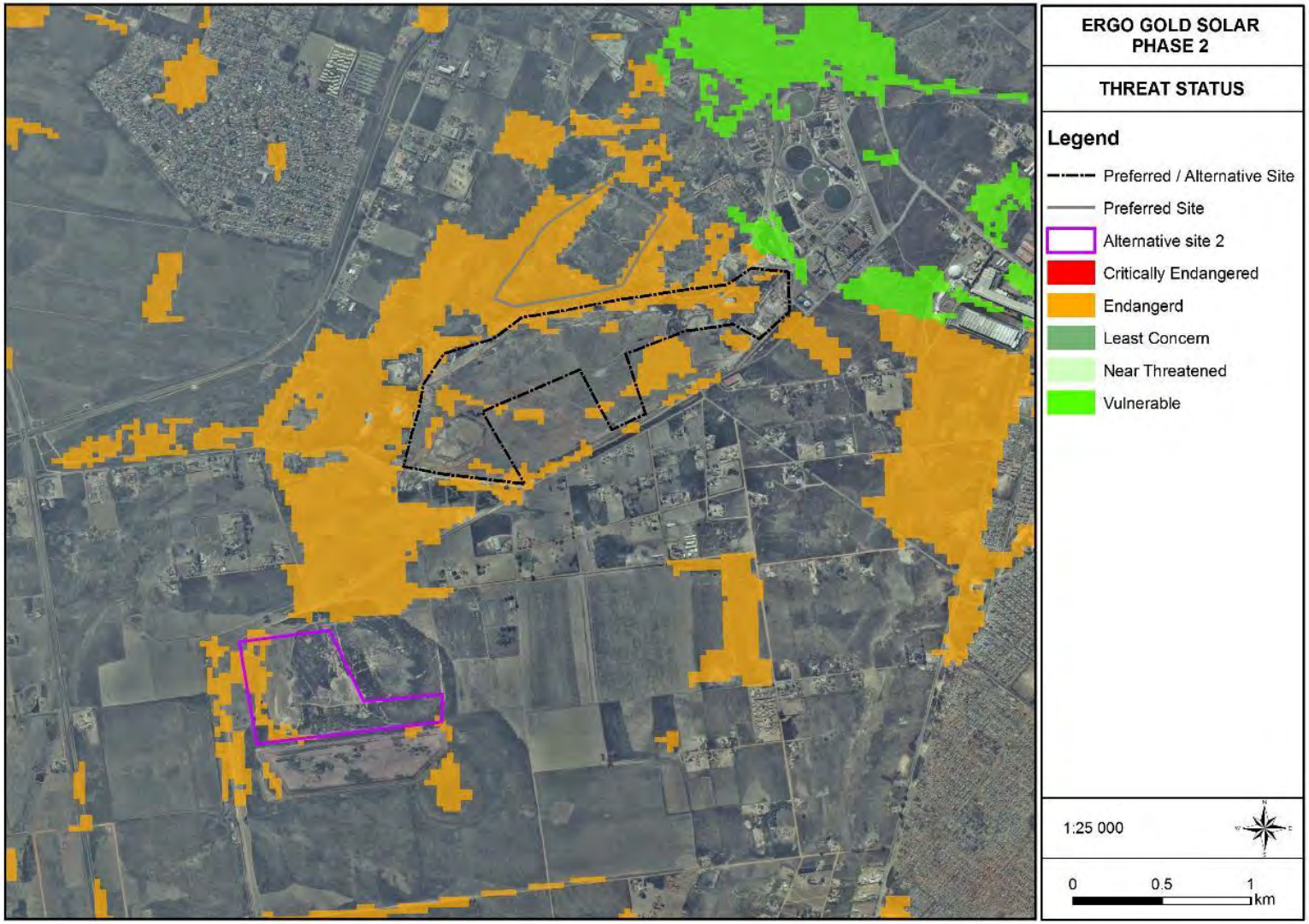


Figure 27: The updated threatened ecosystems as per the recent NBA (2018) shows some remnant patches of the Endangered Tsakane Grassland around the sites

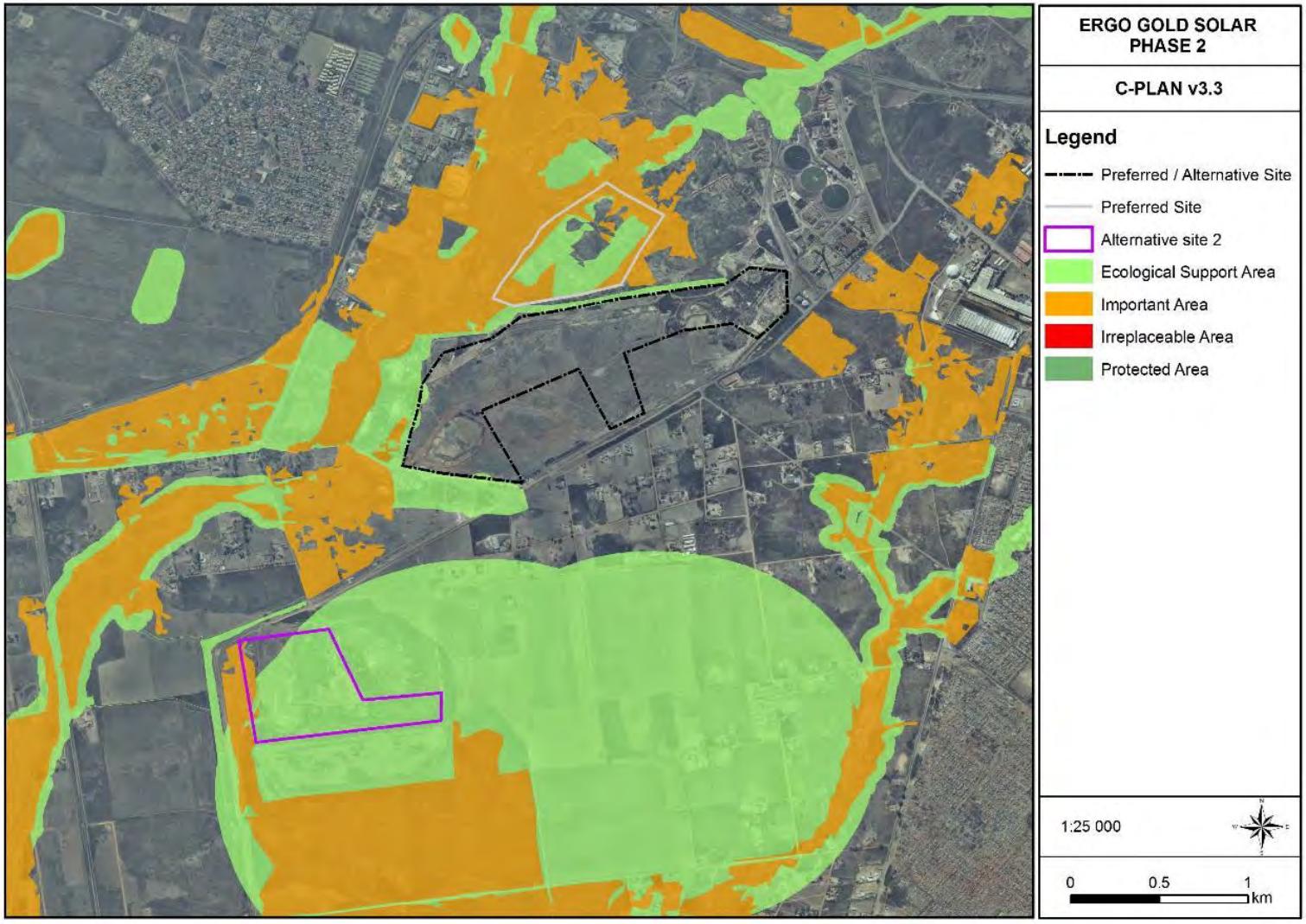


Figure 28: The proposed development in relation to the Gauteng Conservation Plan

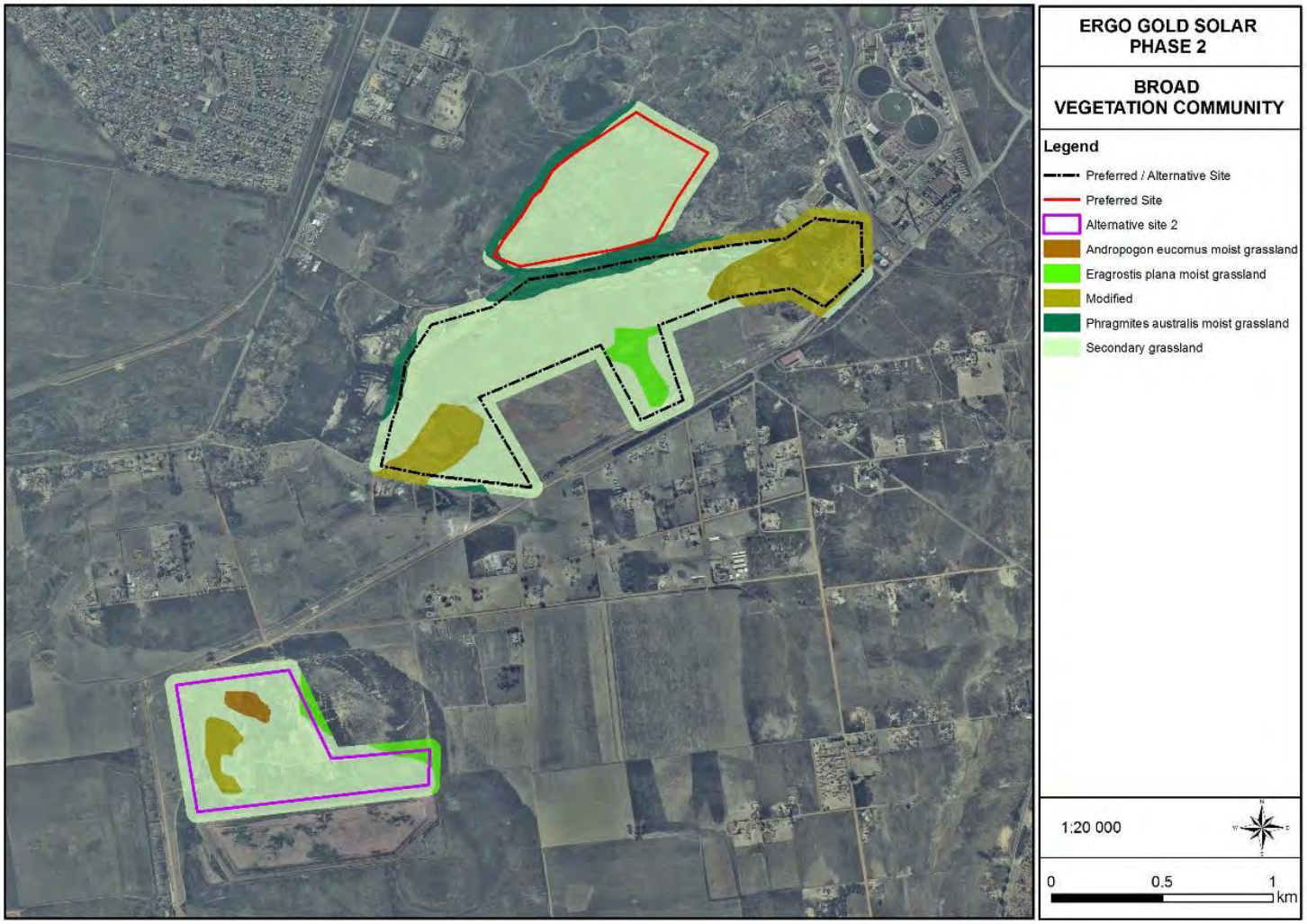


Figure 29: Vegetation map

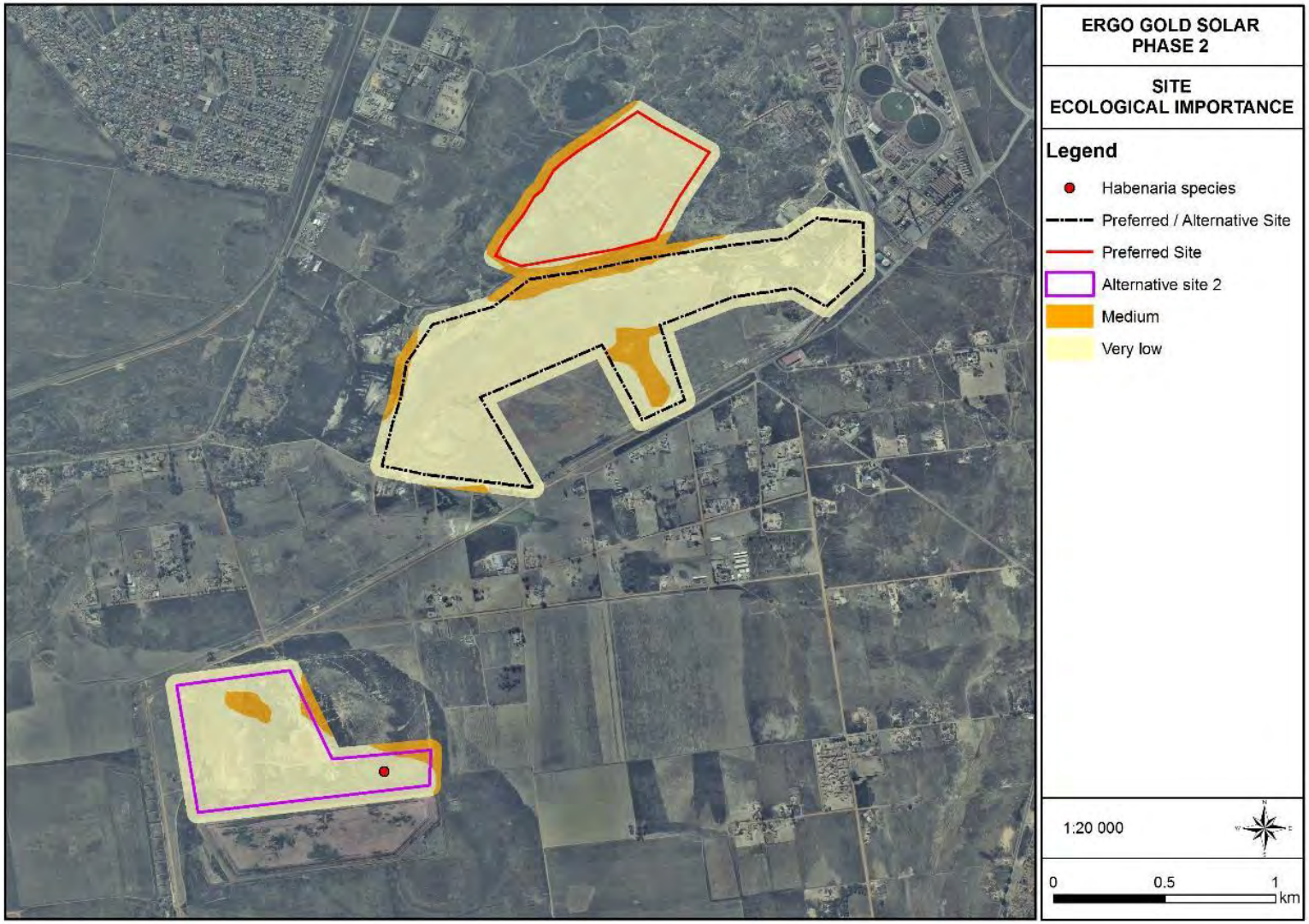


Figure 30: Site Ecological Sensitivity for the proposed sites, including a 50m buffer

One provincially protected species was recorded on Portion 9 of the Farm Withok (Alternative site) during the May 2022 field survey (Figure 30). The orchid species was already dry and the flowers dead (Figure 31). However, it is believed to be a *Habenaria* species, likely *Habenaria schimperiana. H schimperiana* was recorded during Phase 1 along the proposed powerline (Dimela Eco Consulting, 2022).

Figure 31: Orchid species recorded in the secondary grassland on Portion 9 of the Farm Withok (Alternative site)

Table 18: Scoring of vegetation that occurs within the Primary Area of Influence (PAOI)

Preliminary broad vegetation community	Conservation Importance (CI)	Functional Integrity (FI)	Receptor Resilience (RR)	Biodiversity Importance (BI)	Preliminary Site Ecological Importance (SEI) – mitigation
Secondary grasslands*	Very -low	Medium	High	Very-low	**Very-low (Minimise & Restore)**
Modified vegetation	Very -low	Low	High	Very-low	**Very-low (Minimise & Restore)**
Moist grasslands	High	Medium	Medium	Medium	**Medium (Minimise & Restore)**

Result of desktop assessment for the additional access road

The additional road proposed to access Portion 272 of the Farm Witpoortje 117 via 17th Road was not sampled by the specialist, however, Google Earth Satellite imagery and photographs received from the client, indicated that most of the vegetation along the proposed road were also modified (Figure 32). The road comprises an existing tar road in the

south and an existing dirt road in in the north. The vegetation includes stands of Eucalyptus trees and was impacted on by historical activities around the hostel and mine. The road has been used for several years and will likely only be widened.

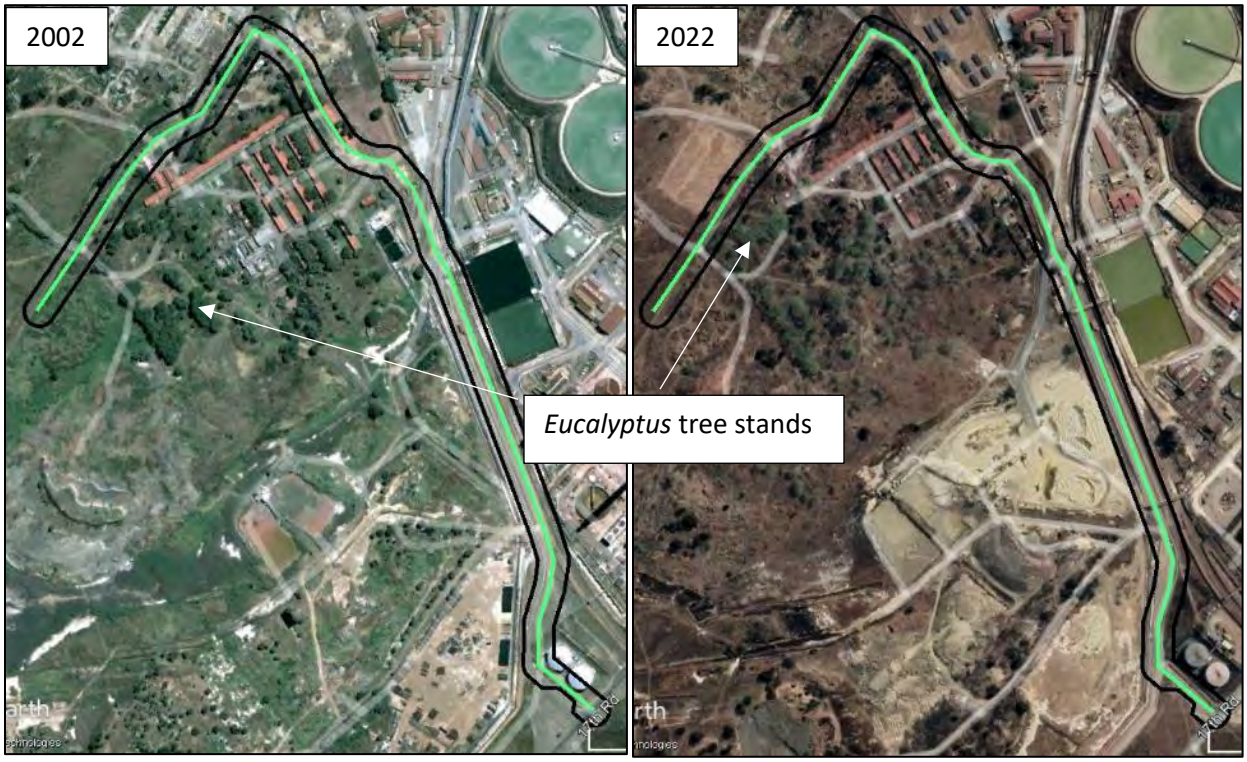


Figure 32: Google Earth satellite imagery of the additional access road in the years 2002 and 2022 showing the largely modified state of the vegetation along the road and within a 20m buffer thereof

Fauna

Mammals

(Refer to Appendix F)

The Yellow Mongoose (*Cynictis penicillata*), Common Duiker (*Sylvicapra grimmia*) and Pretoria Mole-rat (*Cryptomys pretoriae*) are considered as confirmed species for the Phase 1 project area. All are tolerant of man-modified habitats and common in rural settings.

In addition, paw prints of a large cat were observed in the Alternative expansion area. It is suspected to belong to the Caracal (*Caracal caracal*) due to the size of the prints.

The following TOP and endemic species are listed as likely to occur in the Phase 2 project area and surrounds; the wetland species are principally discussed as small sections of appropriate wetland areas occur along the northern boundary of the Preferred expansion area:

- Serval (*Leptailurus serval*) (GN151 Protected). Main threats include loss and degradation of wetlands and associated grasslands. Wetlands generally harbour high rodent densities compared with other habitat types, and form the core areas of Serval home ranges; disruption to such habitats reduces prey-base (Ramesh *et al*., 2016).

- Southern Reedbuck (*Redunca arundinum*) (GN151 Protected). Impacted in the past by habitat transformation and degradation associated with agricultural activities and settlements. On agricultural land, they are subjected to possible persecution due to damage to pastures and crops. Also susceptible to hunting, snaring and poaching (du Plessis *et al*., 2016).

- Southern African Hedgehog (*Atelerix frontalis*) (GN151 Protected). Main threats include habitat loss, degradation and fragmentation from urban sprawl and agriculture. Also threatened by illegal harvesting from the wild for food, or for sale as pets and for traditional medicine (Light *et al*., 2016).

No exotic or AI species were recorded for the QDGS. Cats (*Felis cattus*) were noted in the area and dogs (*Canis familiaris*) were heard around site during Phase 1 assessments. The area is also an agricultural area and utilised for stock grazing. Cattle and chickens are confirmed and it is also suspected that sheep occur in the area based on scat and tracks observed during Phase 1 site assessments.

Herpetofauna

Only one species of frog was confirmed for site during Phase 1 site assessments and was also previously recorded in the larger QDGS:

- Giant Bullfrog (*Pyxicephalus adspersus*) (GN151 Protected). Species is threatened by loss and degradation of its wetland and neighbouring terrestrial habitat.

A juvenile Giant Bullfrog was observed during Phase 1 assessments, on the move near the Rietspruit Tributary further south of the Phase 2 project area, outside all Phase 2 development areas. The Giant Bullfrog has been reported to be declining and is listed nationally as Near Threatened and effort must be made to conserve the species by way of maintaining the natural habitats and ecological corridors remaining in the area. In terms of the

Phase 2 areas, the main potential area would be the wetland in the north and north-west of the project area associated with the CBA area and largely excluded from the development areas proposed for Phase 2.

No other TOP species (other than the Giant Bullfrog) have been recorded or are expected in the area.

Endemic species that have been recorded for the QDGS or considered likely in the area are not restricted species and the area is not a site of endemism for reptiles or frogs.

No AIS or exotic species were identified from ADU lists or iNaturalist.

Invertebrates

One SCC butterfly has distribution near the area and has been recorded for the QDGS (October 2015) and includes:

- *Aloeides dentatis dentatis* (Lepidoptera: Nymphalidae) (RL Endangered; IUCN Vulnerable). Host plant, *Hermannia depressa*, was confirmed scattered throughout the grasslands along the power line route surveyed during Phase 1. The other known host plan, *Lotononis eriantha* was not confirmed on site. The species is mapped in the Gauteng conservation plan and is known from three localities in Gauteng Province, all within protected areas (i.e. Ruimsig Entomological Reserve, Klipriviersberg Nature Reserve, Suikerbosrand Nature Reserve). The species is therefore unlikely on site (Gauteng C-Plan technical report).

Butterflies were specifically noted on site during the surveys, but no *Aloeides dentatis dentatis* or similar, potentially confusing, species were noted on site, despite Phase 1 surveys being within a peak flight period of the species and supporting patches of appropriate habitat. Phase 2 development areas are not considered to provide ideal habitat for the species.

Other TOP ADU species confirmed for the QDGS include the Baboon Spider, *Harpactira hamiltoni* (Araneae: Theraphosidae); it is a nocturnal burrowing species unlikely to be confirmed during diurnal surveys, but cannot be excluded from the more natural habitats in the greater area. The historically disturbed nature of Phase 2 development areas makes the species unlikely within these areas.

The following butterflies were confirmed for the site during Phase 1 and Phase 2 assessments:

- *Junonia orithya madagascariensis* (Lepidoptera: Nymphalidae) (Eyed Pansy).
- *Junonia hierta cebrene* (Lepidoptera: Nymphalidae) (Yellow Pansy).
- *Danaus chrysippus* (Lepidoptera: Nymphalidae) (African Monarch).
- *Pontia helice helice* (Lepidoptera: Pieridae) (Meadow White).
- *Eurema brigitta brigitta* (Lepidoptera: Pieridae) (Broad-bordered Grass Yellow).
- *Catopsilia florella* (Lepidoptera: Pieridae) (African / Common Vagrant).
- *Tarucus sybaris* (Lepidoptera: Lycaenidae) (Dotted Blue).

Avifauna

Important Bird Areas

(Refer to Appendix G)

Some sites are exceptionally important for maintaining the taxa dependent upon the habitats and ecosystems in which they occur. Vigorous protection of the most critical sites is one important approach to conservation. Many species may be effectively conserved by this means. Patterns of bird distribution are such that, in most cases, it is possible to select sites that support many species. These sites, carefully identified on the basis of the bird numbers and species complements they hold (i.e. globally threatened, range restricted and or migratory or congregatory species) are termed Important Bird Areas (IBAs). IBAs are selected such that, taken together, they form a network throughout the species' biogeographic distributions. IBAs are key sites for conservation – small enough to be conserved in their entirety and often already part of a protected-area network.

The proposed SEF is not located within the confines of an Important Bird Area (IBA). The closest IBA to the proposed study area is the Blesbokspruit IBA (SA021) with its most western boundary located approximately 10km to the east of the proposed solar site (Figure 33). The Blesbokspruit IBA is a large, highly modified wetland which extends along the Blesbokspruit, one of the Vaal River's larger tributaries, from the Grootvaly Wetland Reserve in the north to the Marievale Bird Sanctuary in the south. More than 220 species have been recorded for the IBA in SABAP2. The highly productive water which is artificially maintained by the inflow of mining, industrial and municipal effluents, provides food for Lesser Flamingo *Phoeniconaias minor* and Greater Flamingo *Phoenicopterus roseus*. The system also supports a diversity of waterbird species, including Goliath Heron *Ardea goliath*, Purple Heron *Ardea purpurea*, African Spoonbill *Platalea alba*, Glossy Ibis *Plegadis falcinellus*, Pied Avocet *Recurvirostra avosetta*, Red-knobbed Coot *Fulica cristata* and White-winged Tern *Chlidonias leucopterus* (Marnewick et al. 2015). African Marsh Harrier *and* Grass-Owl have been displaced from much of the surrounding area as a result of intense industrialisation, urbanisation and habitat modification.

Although this wetland is thought to hold 20,000 individual waterbirds, there is insufficient data to indicate that any species meet the IBA criteria (Marnewick et al. 2015). It is important to note that no distinct waterbird flight paths were observed across the proposed solar site in relation to the network of wetland areas to the east of the study area during the site surveys. Despite the close proximity (in bird terms) of the Blesbokspruit IBA to the study area, the construction and operation activities of the proposed SEF will not have a negative impact on the IBA and the species it supports. Of the species mentioned above African Marsh Harrier and Red-knobbed Coot *Fulica cristata* were recorded in the waterbody areas within the study area during the respective site surveys.

Avifauna: Protected Areas

Four protected areas are located within a 20km radius of the PAOI (Figure 33). These areas are protected by law and managed for biodiversity conservation, providing much needed habitat that can potentially support a diversity and abundance of avifaunal species. Similarly, to IBAs these areas may provide an indication of the avifaunal species that are likely to occur in similar habitats found within the PAOI. It is unlikely that the disturbance associated with the construction of the 40MW SEF will have a significant negative impact on the surrounding protected areas and the species they support.

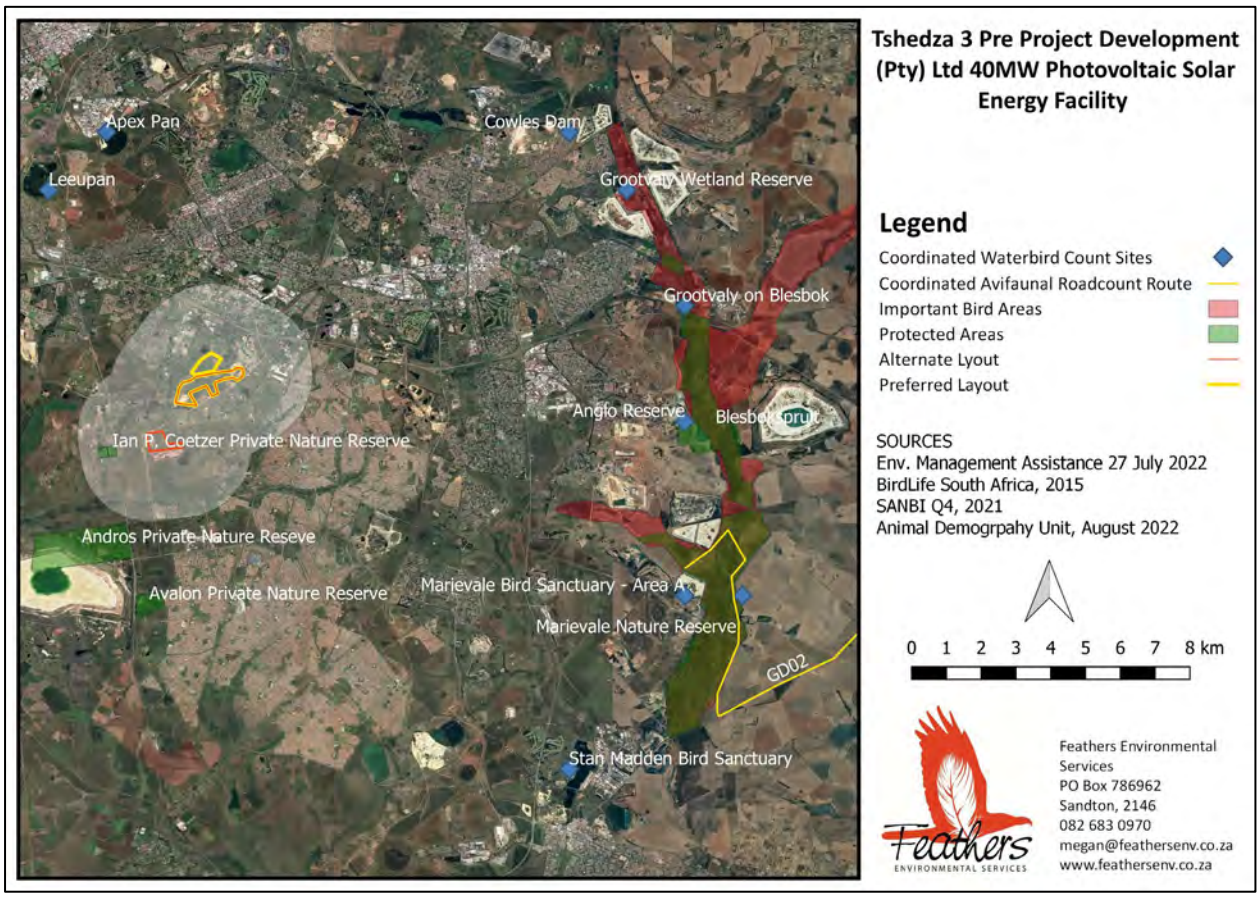


Figure 33: Regional map detailing the location of the proposed 40MW SEF development area in relation to Protected Areas, IBAs, CWAC sites and CAR routes.

Coordinated Avifaunal Roadcount (CAR) Routes

Cranes, bustards, storks and other large birds that spend most of their time on the ground, need wide, open spaces and are certainly not restricted to protected areas. Agricultural habitats are used extensively for feeding, roosting and breeding, often because no natural, pristine habitats are available, and sometimes because the agricultural habitats are especially attractive to birds. The Coordinated Avifaunal Roadcounts (CAR) project monitors the populations of 36 species of large terrestrial birds in agricultural habitats, in addition to gamebirds, raptors and corvids along 350 fixed routes covering over 19 000km (http://car.adu.org.za/). Although CAR road counts do not give an absolute count of all the individuals in a population, they do provide a measure of relative abundance in a particular area. Given the built-up nature of the study area, there are no CAR routes within the proposed development area. Route GD02 occurs within a 20km of the study area and is associated with the Blesbokspruit IBA (Figure 33). This route has recorded White Stork *Ciconia ciconia*, Secretarybird *Sagittarius serpentarius*, Common Buzzard *Buteo buteo* and Back-winged Kite *Elanus caeruleus*. Helmeted Guineafowl *Numida meleagris* and Black-shouldered Kite were the only species, monitored by the CAR project, that were recorded during the two site visits to the study area. Neither of these are SCC and are common inhabitants of urbanized environments.

Coordinated Waterbird Count (CWAC) Sites

Although there are no CWAC sites within the immediate study area, there are eight CWAC sites within 20km of the proposed solar site. These include Cowles Dam, Grootvaly Wetland Reserve, Grootvaly on Blesbok, the Anglo Reserve, Marievale (Areas A & B), Leeupan and Apex Pan (Figure 33). Seven of the eight sites are comprised of open water, reedbeds and marshes that support a wide variety of waterbirds including Greater Flamingo, Southern Pochard *Netta erythrophthalma*, Fulvous Duck *Dendrocygna bicolor*, Yellow-billed Duck *Anas undulata*, Red-billed Teal *Anas erythrorhyncha*, Cape Shoveller *Anas smithii*, Ruff *Philomachus pugnax*, Common Moorhen *Gallinula chloropus*, African Purple Swamphen *Porphyrio madagascariensis,* Little Grebe *Tachybaptus ruficollis*, Squacco Heron *Ardeola ralloides*, Black-crowned Night Heron *Nycticorax nycticorax*, Egyptian Goose *Alopochen aegyptiacus*, Spur-winged Goose *Plectropterus gambensis*, Glossy Ibis, African Sacred Ibis *Threskiornis aethiopicus*, White- winged Tern, Grey-headed Gull *Larus cirrocephalus* and egret sp. Apex Pan is an open-water pan with a shoreline of grass/sedge, and an island of *Phragmites*. White-breasted Cormorant, African Spoonbill and Black-headed Heron breed at the pan. Also an important site for Great Crested Grebe White-backed Duck, Greater and Lesser Flamingo, Red-knobbed Coot, Grey-headed Gull and Cape Wagtail. Sewage overflow and squatter encroachment has resulted in a dramatic decline in bird numbers at this site.

While these CWAC sites may provide an indication of the waterbird species that could be supported by natural and artificial impoundments within the study area, these sites will not have a significant impact on the sensitivity rating for the proposed SEF. Of the species mentioned above, Yellow-billed Duck, Red-billed Teal, Common Moorhen, Egyptian Goose, African Sacred Ibis, Little Grebe and Western Cattle Egret *Bubulcus ibis* were recorded in various waterbody areas within the study area during the site visits. Similarly, none of these species are of conservation concern and are commonly found in *wetland* habitats.

South African Bird Atlas Project 2 Data (SABAP2)

A total of 308 bird species have been recorded within the relevant pentads during the SABAP2 atlassing period to date (APPENDIX 1 of Avifauna Report- Appendix G). The presence of these species in the broader area provides an indication of the diversity of species that could potentially occur within the areas earmarked for the proposed 40MW SEF, particularly where pockets of natural vegetation/habitats persist. Of the 308 species, 19 of these are considered to be regional SCC (Taylor et al, 2015). The White Stork *Ciconia ciconia*, which is not listed, but is protected internationally under the *Bonn Convention on Migratory Species* and Lesser Kestrel *Falco naumanni*, a GDARD priority species has also been recorded in the study area. It is important to note that with the exception of Maccoa Duck *Oxyura maccoa* (n=129), Lesser Flamingo (n=174) and Greater Flamingo (n=415) the remaining SCC species have been recorded in low numbers, with less than 20 individual birds being recorded over the fourteen-year survey period. The significant individual numbers of Maccoa Duck, Lesser and Greater Flamingo can be attributed to the number of observations/surveys conducted within the three pentads to the north of the study area, which contain a series of wetlands and waterbodies - habitat that is capable of supporting these species in abundance. Lanner Falcon *Falco biarmicus* is the only SCC species recorded in the single pentad within which the proposed 40MW SEF development sites are located. The low report rates can be attributed to fairly high levels of disturbance and habitat loss associated with the surrounding mining and industrial practices which has

undoubtedly displaced many of the naturally occurring species, that under optimum conditions, would inhabit these areas. Although this report focuses on SCC, since the impacts associated with the construction and operation of the proposed 40MW SEF is likely to be more biologically significant for these species, the impact on non-SCC SEF sensitive avifauna (totalling 107 species) is also assessed, albeit in less detail. Furthermore, SCC can often be used as surrogate species for the others in terms of impacts and the necessary mitigation. The non-SCC priority species that have been considered for this assessment include korhaan, buzzards, kestrels, falcons, herons, geese, ibis and various water dependent species.

Heritage Resources

(Refer to Appendix K for Heritage Impact Assessment)

The study area is highly disturbed by mining activities and archaeological sites and heritage finds were limited to refuse material brought into the area with 20th century artefacts (mixed with modern mining refuse), ruins and broken-down structures and isolated Stone Age artefacts. The spatial distribution of these observations is illustrated in Figure 34. Historical refuse material is washing out of the remains of the slime dams in area A1 and where these were reclaimed. These artefacts are attributed to household refuse and include glass fragments, metal and fragments of burnt cattle bones and were probably discarded along with the mine waste material. Low density and isolated MSA lithics are also recorded where the reclamation of the large slimes dam that covered the entire area A1 used to be. Heritage mitigation of a site on the Ergo property showed that these artefacts are all out of context and most probably being brought in during the construction of the slimes dam (van der Walt in prep). Features were numbered sequentially with the prefix DRD. General site conditions, site distribution and selected features are illustrated in Figure 35 to Figure 48Figure 49. Recorded observations are briefly described in Table 19.

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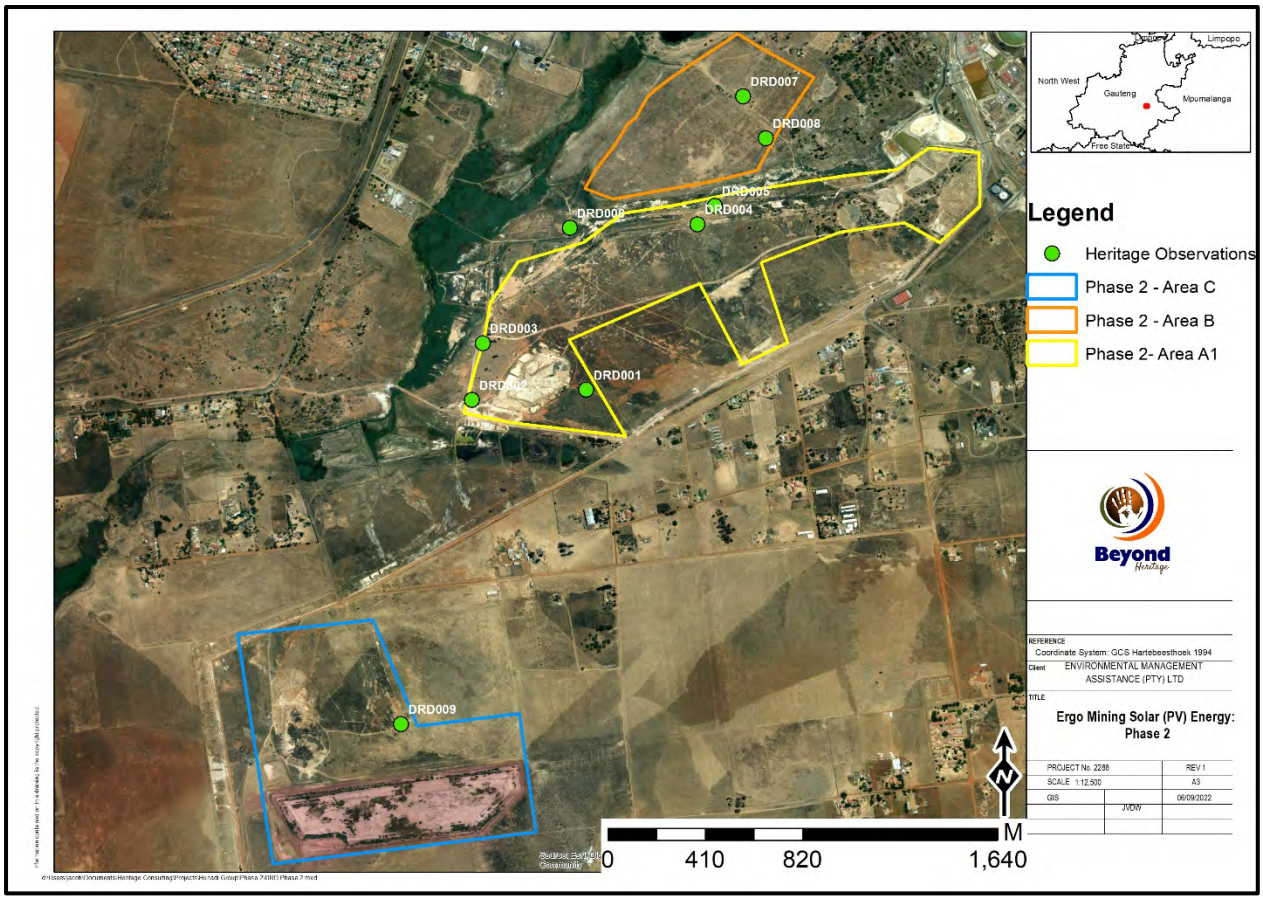


Figure 34: Heritage site distribution in relation to the Project area.

Table 19: Heritage observations recorded in the study area.

Label	Location	Type Site	Description	Significance and Field Rating
DRD 001	28° 21' 28.1952" E 26° 17' 37.4135" S	Historical artefacts	Refuse material that is out of context is found where the remains of the reclaimed slimes dam that covered the entire Area A1 used to be.	GP C Low Significance
DRD 002	28° 21' 12.6217" E 26° 17' 38.7959" S	Historical artefacts	Historical/Recent refuse material that is out of context is found where the remains of the reclaimed slimes dam that covered the entire Area A1 used to be	GP C Low Significance
DRD 003	28° 21' 14.0797" E 26° 17' 31.0451" S	Historical artefacts	Refuse material that is out of context is found at the remains of reclaimed slimes dam is located on the western end of Area A1.	GP C Low Significance
DRD 004	28° 21' 43.3620" E 26° 17' 14.8669" S	Historical artefacts	Refuse material that is out of context is found at the remains of the reclaimed slimes dam that covered Area A1.	GP C Low Significance

DRD 005	28° 21' 45.7129" E 26° 17' 12.3503" S	Stone Age Artefacts	Low density of less than 1 artefact per 2m² of MSA lithics situated on the edge of the small stream between area A1 and B. These are washed and out of context.	GP C Low Significance
DRD 006	28° 21' 25.9596" E 26° 17' 15.3600" S	Ruin	Large broken down structure/foundation. The feature seems to have been a structure with multiple rooms. The feature is totally demolished and only the foundations are still visible as well as a small section of wall. Site measures approximately 20 x 20 m.	GP C Low Significance
DRD 007	28° 21' 49.5937" E 26° 16' 57.4213" S	Ruins	Large series of broken down structures and foundations situated in area B. Only the ephemeral remains of foundations are still visible.	GP C Low Significance
DRD 008	28° 21' 52.6643" E 26° 17' 03.1343" S	Structures	Three small cement structures. Possibly part of past mining infrastructure, currently occupied by squatters.	GP C Low Significance
DRD 009	28° 21' 02.9591" E 26° 18' 22.9393" S	Stone age Artefacts	Small collection of MSA flakes situated on a section of exposed gravels in Area A1 near the remnants of the reclaimed slimes dam and is out of context.	GP C Low Significance

Figure 35: Small collection of glass fragments.

Figure 36: Remains of reclaimed slimes dam.

Figure 37: Small collection of glass artefacts washing out of the remains of the reclaimed slimes dam on the western edge of Area A1

Figure 38: General view of dumped material at the slimes dams.

Figure 39: Refuse material washing out of the existing slimes dams at DRD003.

Figure 40: Small collection of glass artefacts at DRD004.

Figure 41: Dorsal view MSA artefacts at DRD005.

Figure 42:. Ruin at DRD006.

Figure 43: Ruins at DRD007. Only foundations are left in Area B.

Figure 44: Three small structures at DRD008. The structures are currently occupied by squatters.

Figure 45: MSA flakes at DRD009.

Figure 46: Reclaimed slimes dam at DRD009.

Cultural Landscape

The project site is situated on Ergo Mining owned land adjacent to the Withok Estates Agricultural Holdings and Witpoort Estates Agricultural Holdings areas of Brakpan within the City of Ekurhuleni Metropolitan Municipality, Gauteng Province. The area is characterised by cultivation and mining activities from the 1940's onwards.

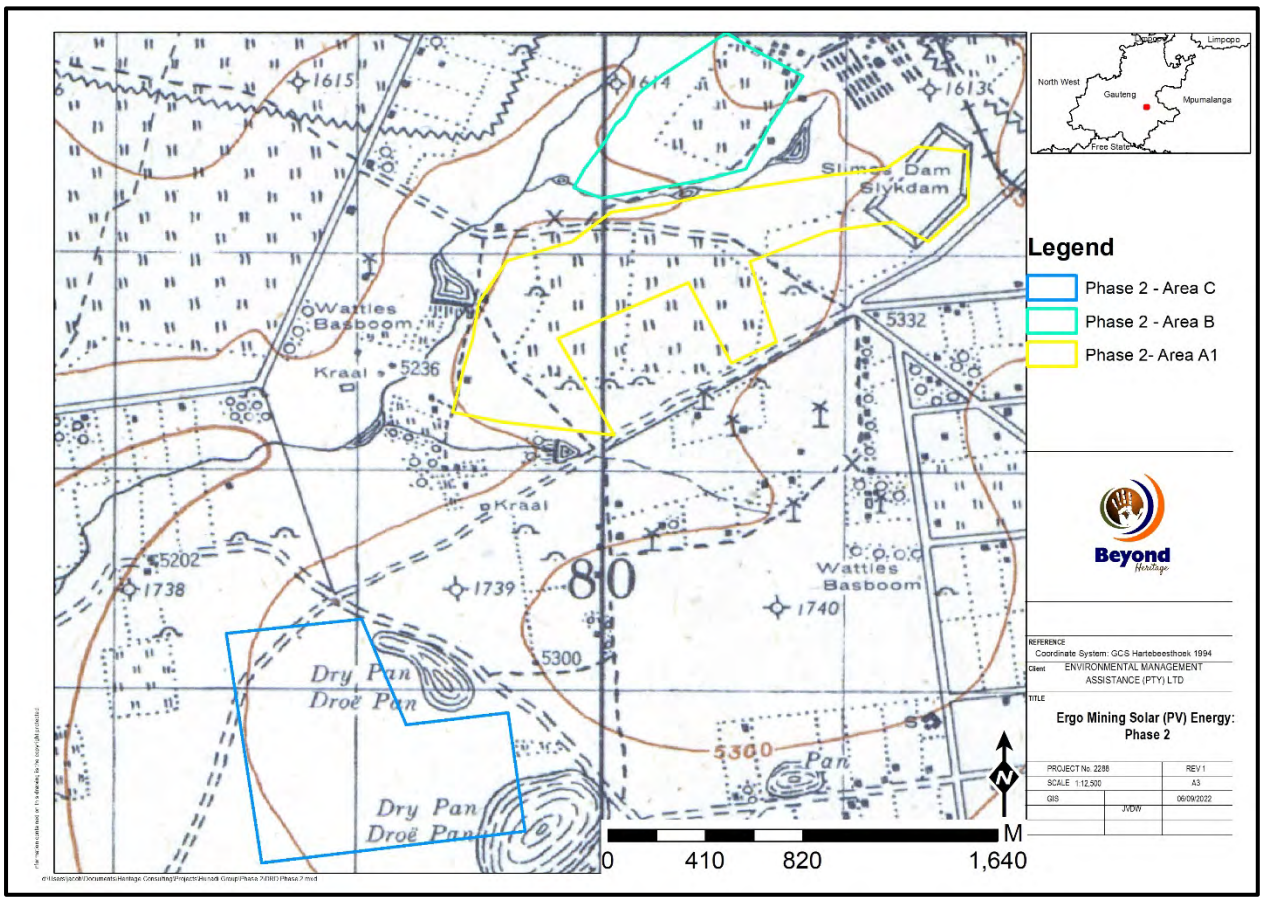


Figure 47:. 1944 Topographic map indicating a number of huts in Area A1 as well as cultivation in the study area.

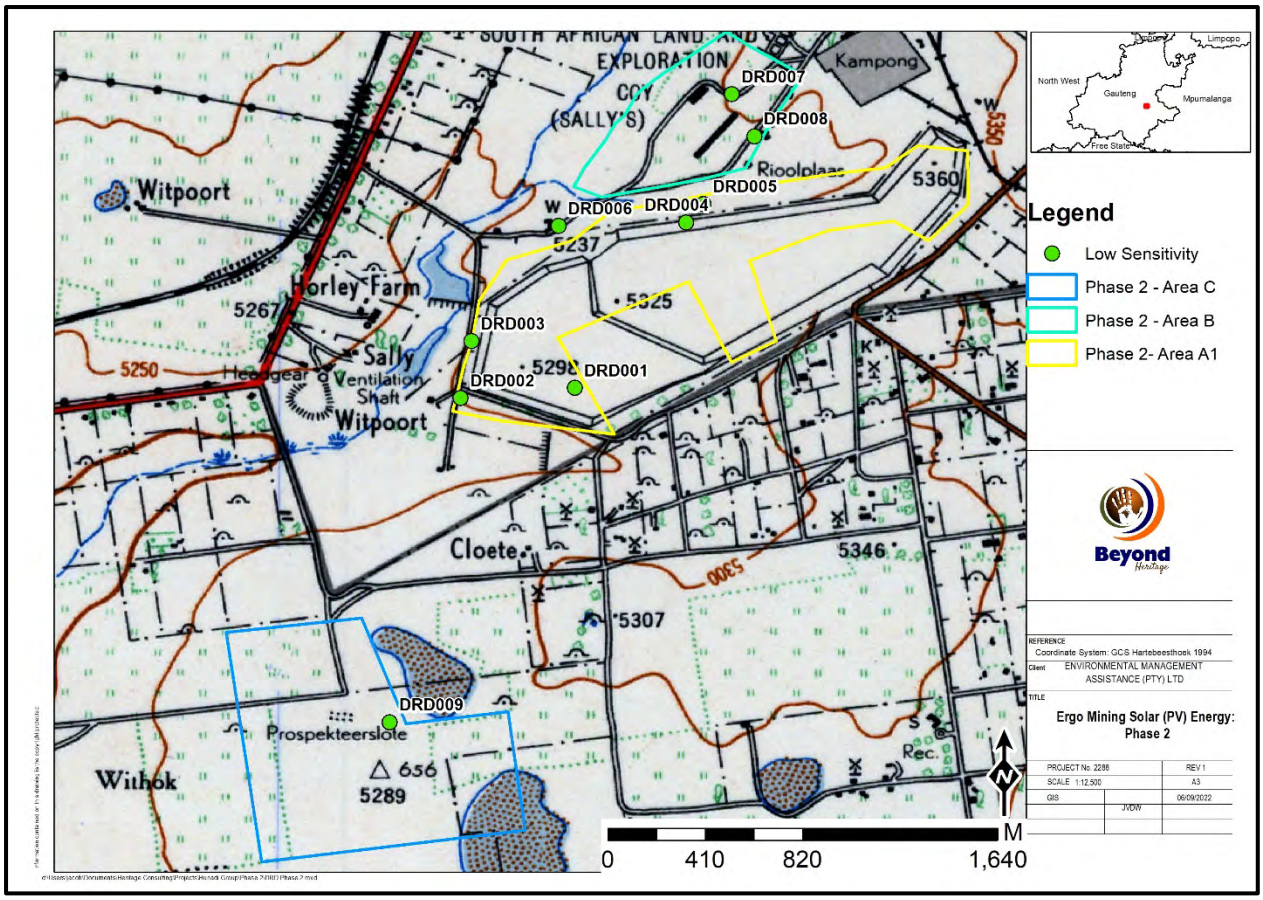


Figure 48: 1960 Topographic map of the study area indicating the recorded observations. Structures are indicated at DRD007 and 008.

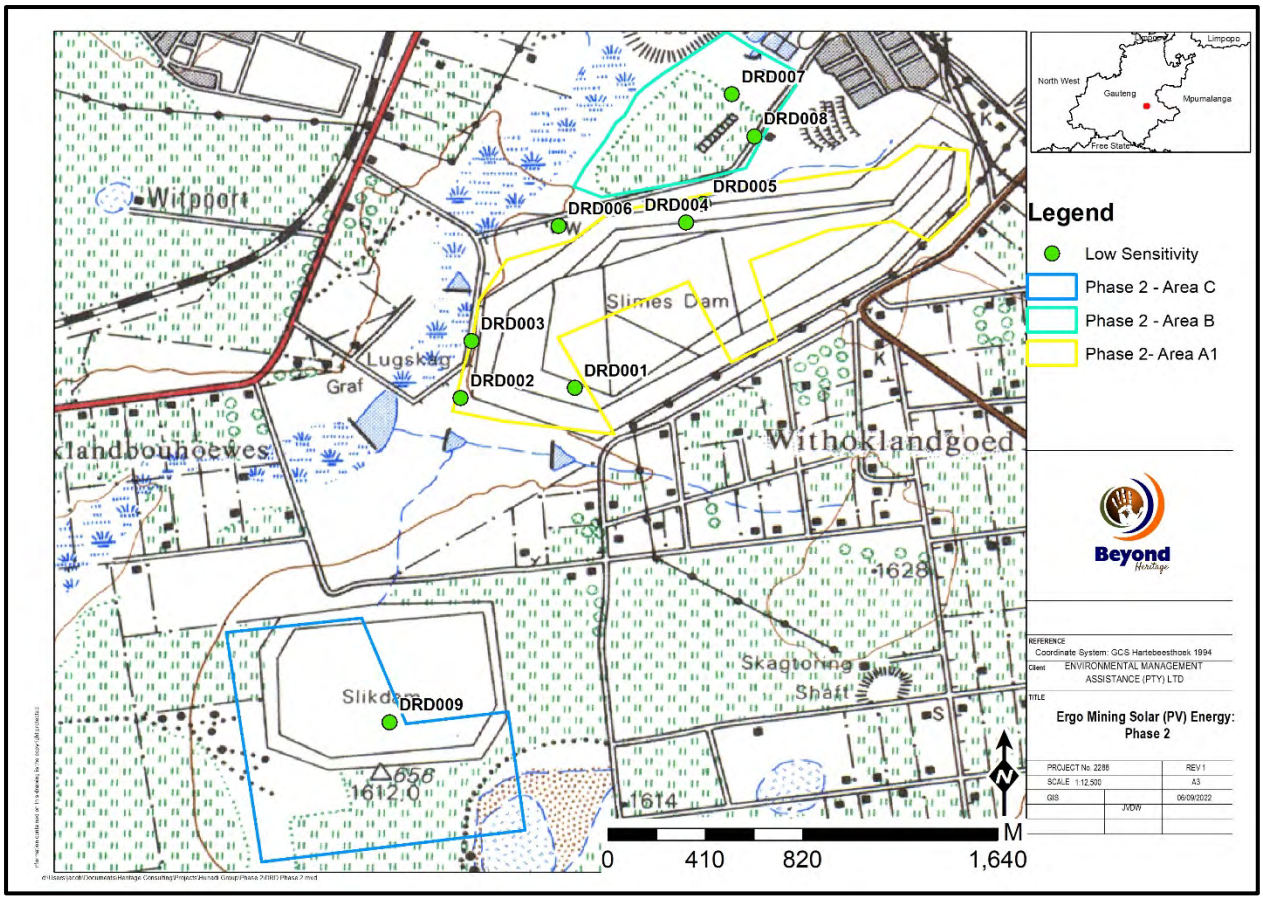


Figure 49: 1976 Topographic map of the study area. Much of the study area have been impacted on by slimes dams and mining developments.

Paleontological Resources

(Refer to Appendix L for Paleontological Impact Assessment)

The palaeontological sensitivity of the area under consideration is presented in Figure 50 for the two northeast sites, and Figure 51 for the Southwest site. Most of the footprint is in the Vryheid Formation (red in the SAHRIS map) that is very highly sensitive for palaeontology. The green colour indicates moderate sensitivity for Quaternary alluvium along the rivers and for the moderately sensitive Dwyka Group rocks.

The Dwyka Group could preserve transported and usually fragmented fossils of the *Glossopteris* flora, and some invertebrates, but these are rare and have not been recorded from the Transvaal.

The Vryheid Formation has extensive coal seams of Early Permian age. Although coal is formed from buried peat that is altered over time by high temperatures and pressures, the original plants that made the peat are not recognisable. The carbonaceous shale bands and lenses between the coal seams are more likely to preserve impressions of the plants. They are typical plants of the *Glossopteris* flora that includes leaves, seeds, reproductive structures and wood of *Glossopteris,* as well as other plants such as lycopods, sphenophytes, ferns and early gymnosperms.

In the Highveld and Witbank coal fields there are five to six coal seams, with No 4 being made up of two seams close together. The uppermost seam, No 5, is on average more than 10m below the ground surface. It is overlain by soils then shales and siltstone or interbedded shale and sandstone (Snyman, 1998). There are no coal mines in this part of the Vryheid Formation but the sediments overlie the much deeper gold reserves in underlying Witwatersrand Supergroup that is non-fossiliferous because it is too old and has been metamorphosed (McCarthy, 2006).

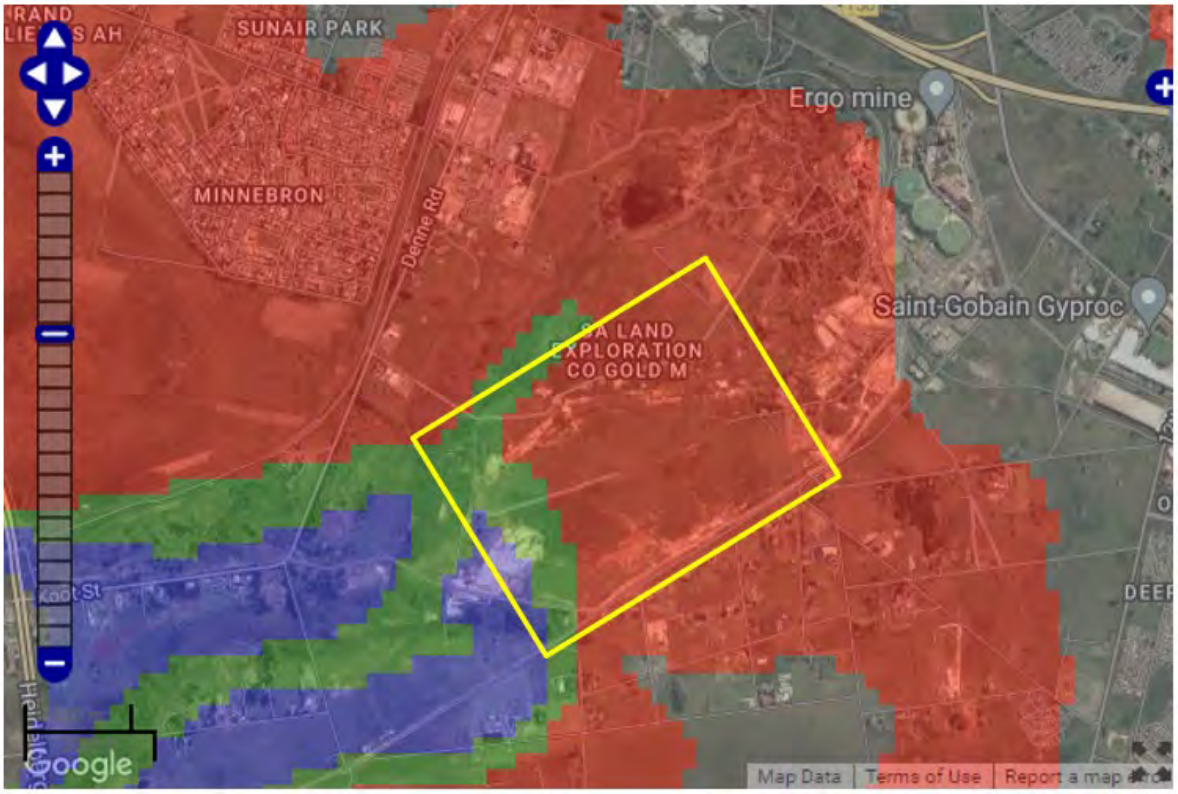


Figure 50. SAHRIS palaeosensitivity map for the site for the proposed northeast sites (preferred layout) for the Ergo Mining Solar Phase 2 project shown within the yellow rectangle[11].

[11] Background colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero.

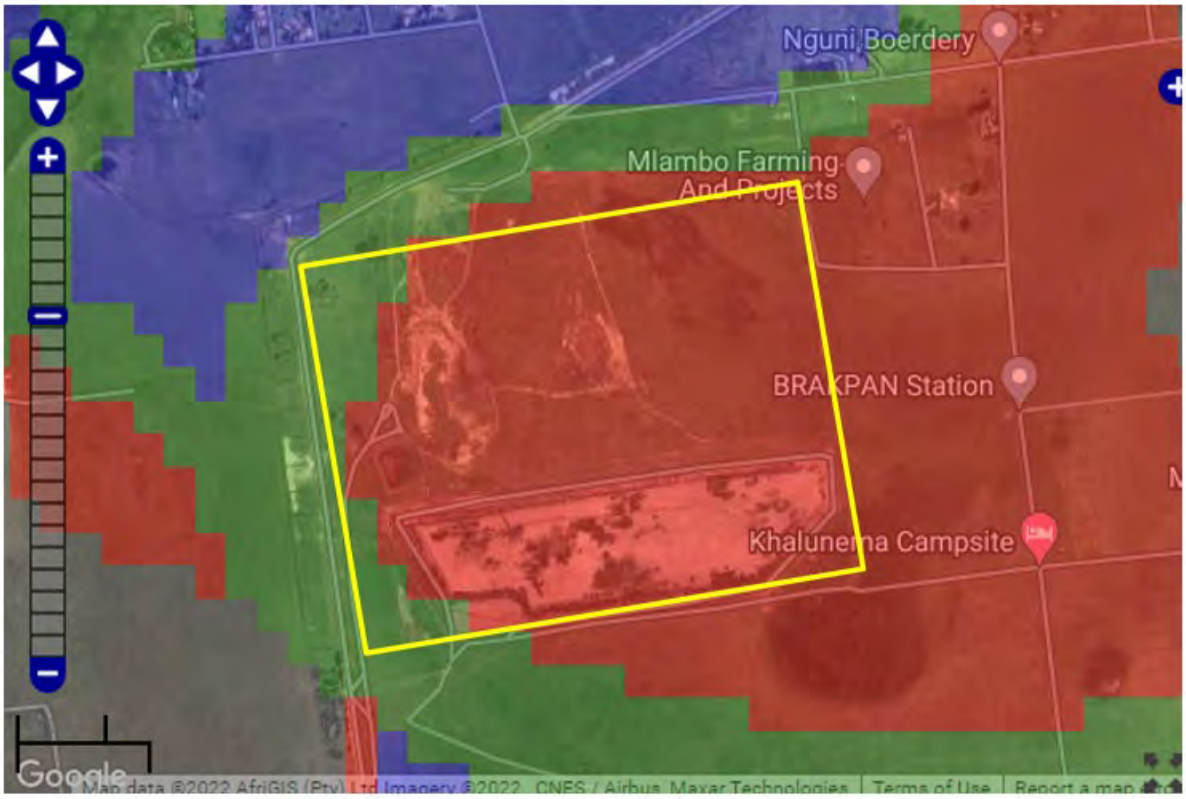


Figure 51: SAHRIS palaeosensitivity map for the Ergo Mining Solar Phase 2 southwest location (alternate layout) within the yellow outline[12].

Visual

Potential visual exposure – SEF (PV panels and ancillary infrastructure)

(Refer to Appendix M for Visual Impact Assessment)

Preferred Layout

The preferred layout's development sites are located adjacent to each other, resulting in a more contained (reduced) area of visual exposure. Refer to Figure 52.

The development would be quite easily visible within a 1km radius of the site. This area (0 – 1km) includes sections of public roads (17th Road and 10th Street) traversing south and east of the proposed development site. The facility is also expected to be visible from the Withok Small Holdings (east) south of the proposed development site.

Within a 1 – 3km radius, the visual exposure is more scattered and interrupted due to the undulating nature of the topography. Visibility is expected from the west along Koot Street and Denne Road, as well as from the Withok

[12] Background colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero.

Small Holdings (west) south of Koot Street. Additional visual exposure is expected to the north at the Witpoort Estate Small Holdings.

Visibility within 3 - 6km is greatly reduced and is primarily expected from higher ground (e.g. the north-facing slopes of the tailings dam) or vacant open space to the south (north of Geluksdal).

At distances exceeding 6km the intensity of visual exposure is expected to be very low and highly unlikely due to the distance between the object (development) and the observer. Overall, most of the areas of visual exposure, not just beyond a 6km radius but within the entire study area, fall within vacant open space, generally devoid of potential observers.

Alternate Layout

The alternate layout's development sites are located approximately 1km apart from each other, at the closest, resulting in a more expansive area of visual exposure, especially to the south. Refer to Figure 53.

The development would be quite easily visible within a 1km radius of the site. This area (0 – 1km) includes sections of public roads (secondary roads and streets (as mentioned above), and the R23 arterial road) traversing within this zone. The facility is also expected to be visible from the Withok Small Holdings east, south and west of the proposed development site.

Within a 1 – 3km radius, the visual exposure is more scattered and interrupted due to the undulating nature of the topography. Most of this zone falls within vacant open space and agricultural/mining land, but does include some farm dwellings and residences on the abovementioned small holdings (e.g. Withok Small Holdings west of the R23 and the Witpoort Estate Small Holdings to the north of the proposed development). Two farmsteads (Daheim and Deovolente) were also identified. These are located respectively south and west of the southern property identified for the PV Plant.

Visibility within 3 - 6km is greatly reduced and is primarily expected from higher ground (e.g. the north-facing slopes of the tailings dam) or vacant open space to the north-west.

At distances exceeding 6km the intensity of visual exposure is expected to be very low and highly unlikely due to the distance between the object (development) and the observer.

Viewshed Analysis Conclusion

In general terms it is envisaged that the structures (both alternatives), where visible from shorter distances (e.g. less than 1km and potentially up to 3km), and where sensitive visual receptors may find themselves within this zone, may constitute a high visual prominence, potentially resulting in a visual impact. This may include residents residing at the Withok Small Holdings (east and west) and at the Witpoort Estate Small holdings, observers at the abovementioned homesteads, as well as observers travelling along the roads in close proximity to the facility. It should also be noted that the Phase 1 ERGO Mining Solar Energy Facility will be located in between the area common to both alternatives (i.e. Phase 2 Area A1) and the Withok east agricultural holdings, potentially influencing the visual exposure of this area.

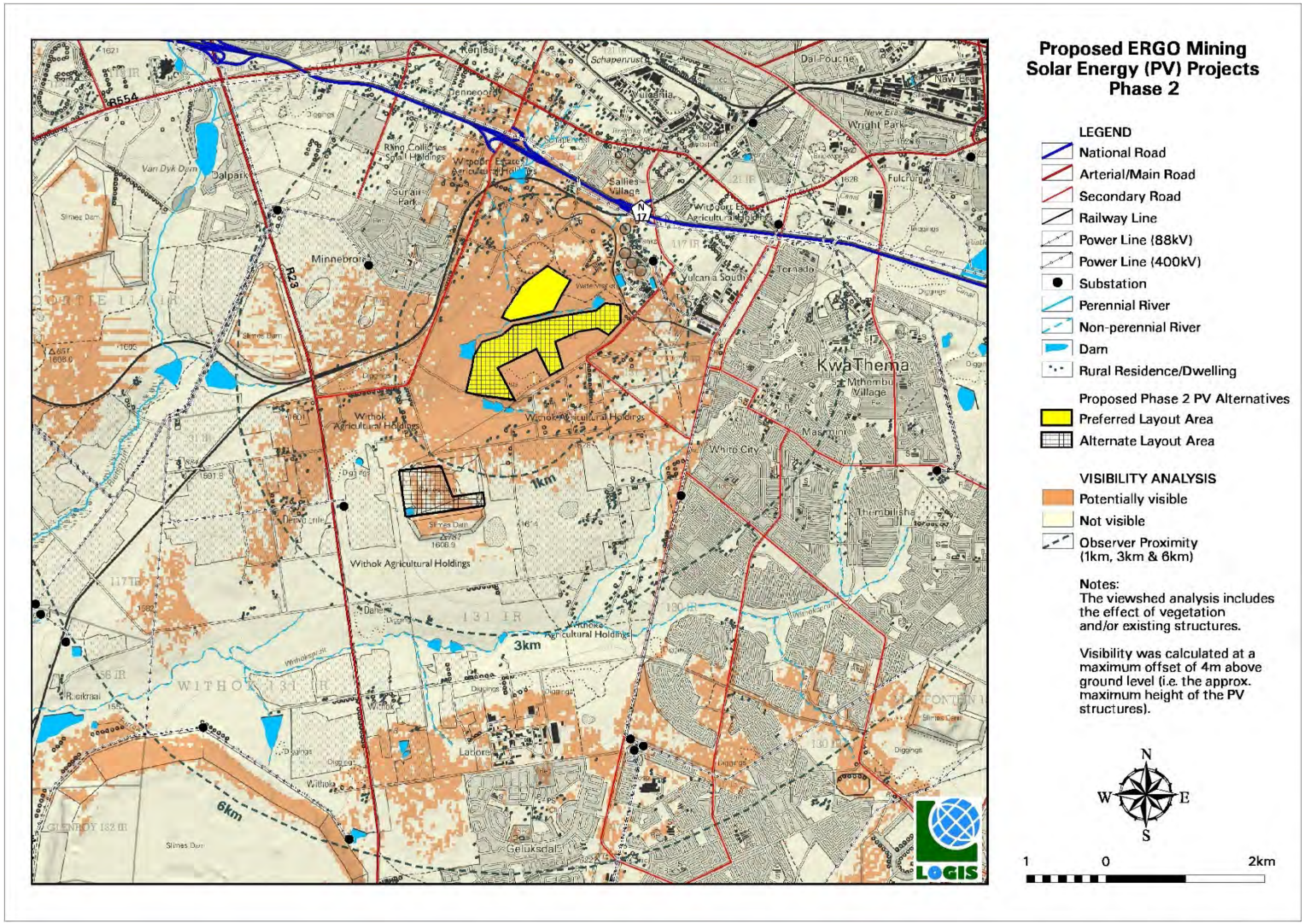


Figure 52: Viewshed analysis of the proposed PV facility – Preferred Layout

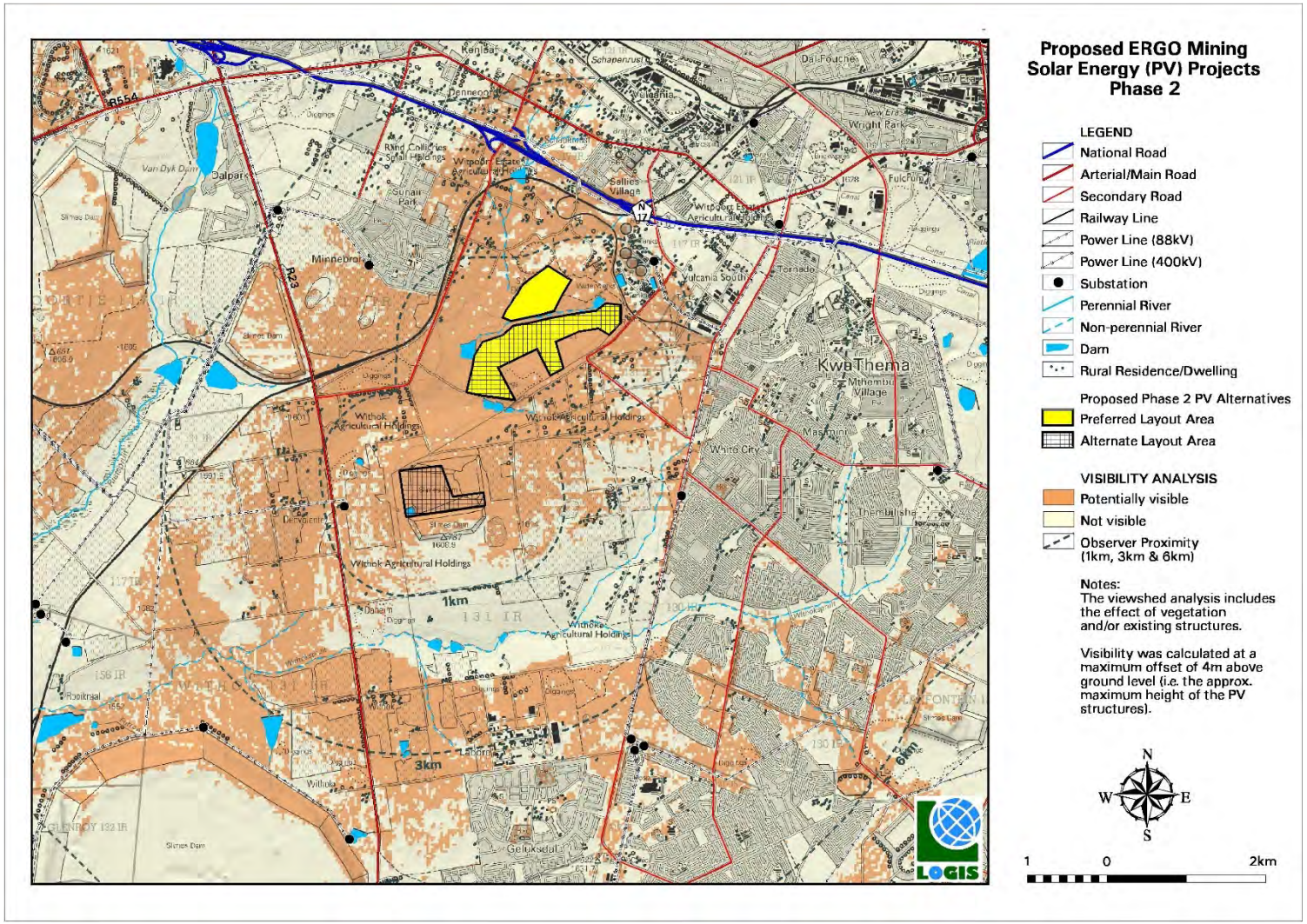


Figure 53: Viewshed analysis of the proposed PV facility – Alternate Layout.

Viewer incidence / viewer perception

The number of observers and their perception of a structure determine the concept of visual impact. If there are no observers or if the visual perception of the structure is favourable to all the observers, there would be no visual impact.

Viewer incidence is calculated to be the highest along the public roads within the study area. Travellers using these roads may be negatively impacted upon by visual exposure to the PV facility.

Additional sensitive visual receptors are located at the dwellings located at the small holdings (Withok and Witpoort Estate Small Holdings) to the south, west and north of the ERGO Mining plant, as well as from some isolated homesteads located further to the west and south.

It is expected that the viewer's perception, unless the observer is associated with (or supportive of) the SEF, would generally be negative. Refer to Figure 54 below for the location of these receptor sites.

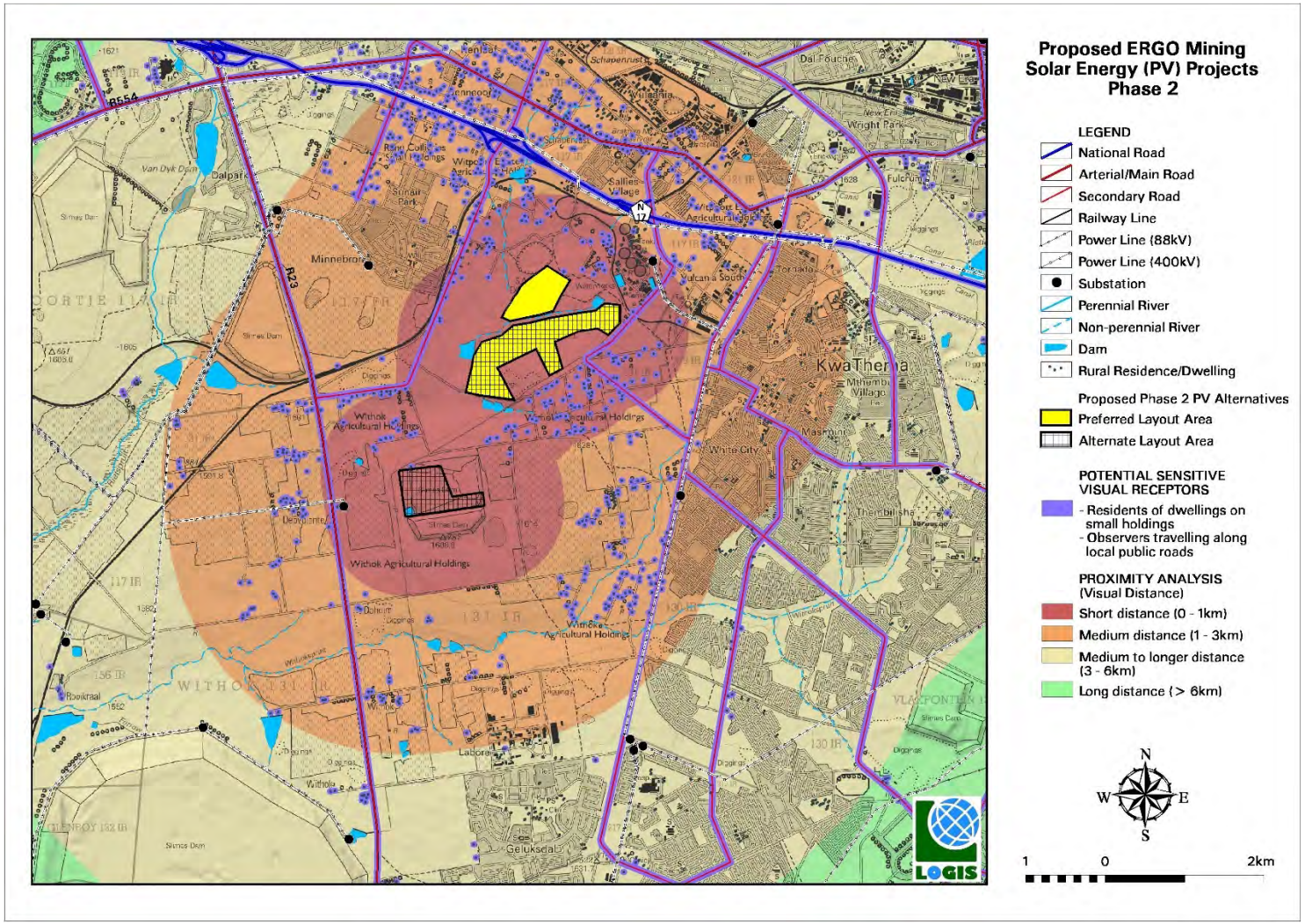


Figure 54: Proximity analysis and potential sensitive visual receptors (Note: proximity buffers are displayed jointly, but analysed separately).

Visual absorption capacity

The broader study area is located within the Grassland biome generally characterised by large open grassy plains and bare soil in places.

Overall, the Visual Absorption Capacity (VAC) of the receiving environment in closer proximity to the proposed SEF is deemed low by virtue of the nature of the vegetation and the low occurrence of urban development. In addition, the scale and form of the proposed structures mean that it is unlikely that the environment will visually absorb them in terms of texture, colour, form and light/shade characteristics. Within this area the VAC of vegetation will not be taken into account, thus assuming a worst case scenario in the impact assessment.

Within the built-up and industrial areas further afield the VAC will be very high due to the shielding effect of built structures and planted vegetation.

Socio Economic Context

(Refer to Appendix N for Socio Economic Assessment)

The population of Ward 74, 82 and 99 is 100 839 people (in 2011), with an average population density of 714 (ranging from 505 to 1124) people per square kilometre (Statistics SA, 2012). This is 3% of the total population of the City of Ekurhuleni Municipality (3.1 million).

The population of the wards is considered youthful, with 67% being below the age of 35, and 26% below the age of 15 (Figure 55) (Statistics SA, 2012). There is a slightly higher ratio of men to women in the local area at 52% male to 47% female (Statistics SA, 2012). This is likely to be due to the high concentration of mining and industrial activities, and the related in-migration of men for employment.

The dependency ratio is 40%, which is marginally higher than Gauteng (39%) but lower than the national ratio of 56% (Statistics SA, 2012). The majority (85%) of the population within the three wards is Black African, followed by Coloured (8%), and White (6%) (Figure 56) (Statistics SA, 2012).

There are a number of languages spoken within the study area. isiZulu is the most spoken (19%), followed by English (13%), Afrikaans (12%), Sesotho (11%) and Sepedi (10%). This variety is likely to reflect the in-migration of people seeking work or working in the area (Figure 56).

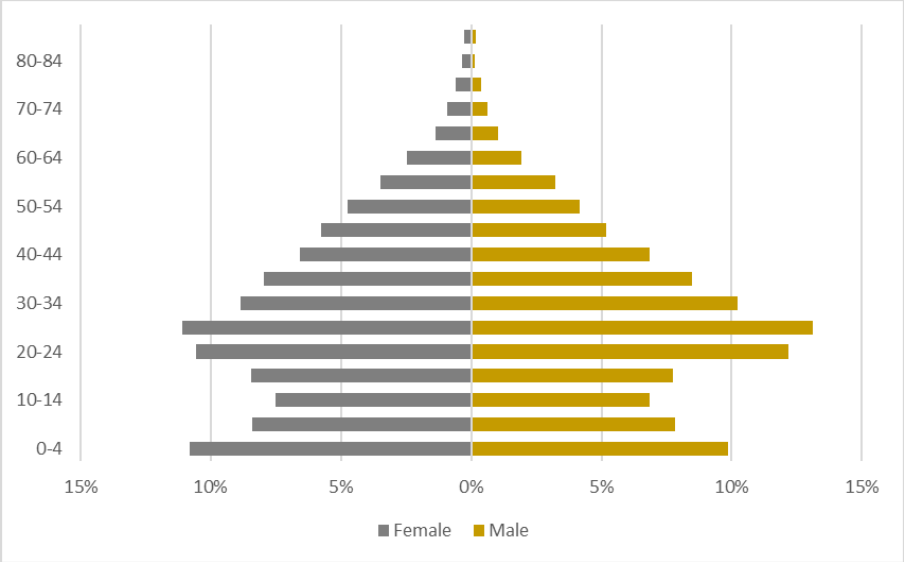


Figure 55: Population pyramid for Wards 74, 82 and 99

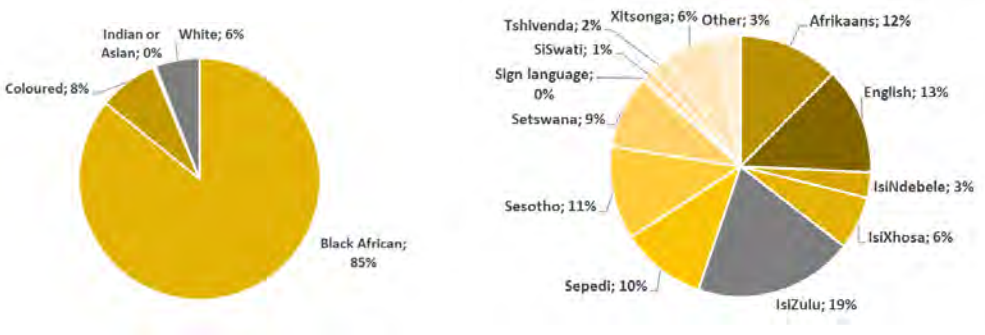


Figure 56 Population Groups and Languages for Wards 74, 82, 99

The local area is classified as urban and comprises 77% formal residential, 15% informal residential, 1% smallholdings and 1% industrial properties (Statistics SA, 2012)[13]. The level of access to basic services is moderates and slightly lower than the Gauteng and Ekurhuleni Municipality averages. The key indicators for municipal service for the three wards are provided in Table 20 below.

Table 20 Level of Access to Basic Services for Wards 74, 82 and 99

Service		Highest percentage	Next Highest percentage	No access
Piped Water		51% inside dwelling	29% in yard	0.4%
Sanitation		78% flush toilet	17% pit latrine	1%
Energy	Cooking	71% electricity	24% paraffin	0.1%
	Heating	62% electricity	13% paraffin	10%

[13] *Note percentages are based on the number of land parcels, not percentage of land. Many formal houses take up small amounts of land, but smallholdings cover a large portion of the local area.*

Service		Highest percentage	Next Highest percentage	No access
	Lighting	73% electricity	19% candles	1%
Refuse removal		85% by municipality	7% own / communal dumps	6%

Source: Census 2011, Statistics SA 2012

The local area comprises a mix of low and middle-income households, with 20% of local households not receiving any form of income. The majority of households (59%) are considered low-income, 21% of households considered middle-income, and 0.2% considered high-income households.

Unemployment in these wards is 33% (excluding 5% discouraged work seekers) (Statistics SA, 2012). This lower than the national and municipal (Ekurhuleni) of 27 %, and provincial levels of 25% in 2011 (Statistics SA, 2012). There are likely to be a number of people who have moved into the area seeking jobs, but not able to find employment. This is likely to have become exacerbated during 2020 due to Covid-19-related restricts and economic slow-down.

EXISTING ROAD NETWORK

The main access routes to the region include the N17 national road, the R23 and R554 arterial roads, and a number of lower order secondary roads and streets. Access to the site, from the N17, is along the Ergo Road, 17th road and 10th Street. These roads will lead you to the Withok Small Holdings immediately south of the proposed development site. The latter road traverses adjacent to the slurry pipeline that traverses between the mine and the tailings dam.

17th Road: Is a Class 4 municipal road and borders the proposed development on the eastern corner of the site. Site access proposed includes:

- External access via route approved as per phase 1: Upgrade of existing access road/s along slurry pipeline/ and or via 18th Street via Denne and Koot Road to the PV site, parallel to Tenth Street.
- An additional access point for the construction/operational phase via an existing road network to access Portion 272 of the Farm Witpoortje 117 I.R. is proposed via 17th Road- vehicles will drive past the old mine compound, continuing via an existing farm track previously used in apparent farming activities to the top of the proposed north PV block. Developer proposes to upgrade the existing farm track with gravel from below the compound.

Protected areas within 10km of site

No areas of international conservation (RAMSAR Wetlands and World Heritage Sites), Important Bird Areas (IBAs), National or Provincial Protected Areas, or National Protected Areas Expansion Strategy

(NPAES) areas occur within 10km of site. However, a Private Nature Reserve is situated to the west of the site. The status of the reserve is unknown.

b) Description of the current land uses

Land use within the study area is indicated as mixed use, with a varied urban (residential), mining, industrial and agricultural character (Figure 57). The main populated places include KwaThema (White City, Masimini and Thembilisha), Minnebron, Sunair Park, Dal Park and Geluksdal. The Withok Agricultural Holdings (or small holdings) are located immediately south and west of the proposed PV Plant properties and the Witpoort Estate Agricultural Holdings to the north of the properties. Existing industrial areas include the Vulcania industrial area and Vulcania South industrial area east of the mine. The Labore industrial area is located north of Geluksdal near the Ergo Transfer Pump Substation.

Figure 57: Industrial/commercial land use within the study area.

c) Description of specific environmental features and infrastructure on the site.

The most notable infrastructure located within the application area includes the following:

- Slurry pipelines
- Overhead power lines
- Gravel roads and foot paths

Refer to Figure 58 to Figure 63 for images of infrastructure and land use at proposed site and surrounds.

Figure 58: Topography and general environment of the proposed Ergo SEF site and surrounds, power lines and pipeline infrastructure.

Figure 59: General environment along the slurry pipeline.

Figure 60: Withok Small Holdings (left) and the proposed Ergo SEF project site (right).

Figure 61: Existing tailings dam at the Ergo Transfer Pumps Substation.

Figure 62: ERGO Gold Mine.

Figure 63: Existing slurry pipeline near the R23 arterial road.

d) Environmental and current land use map.

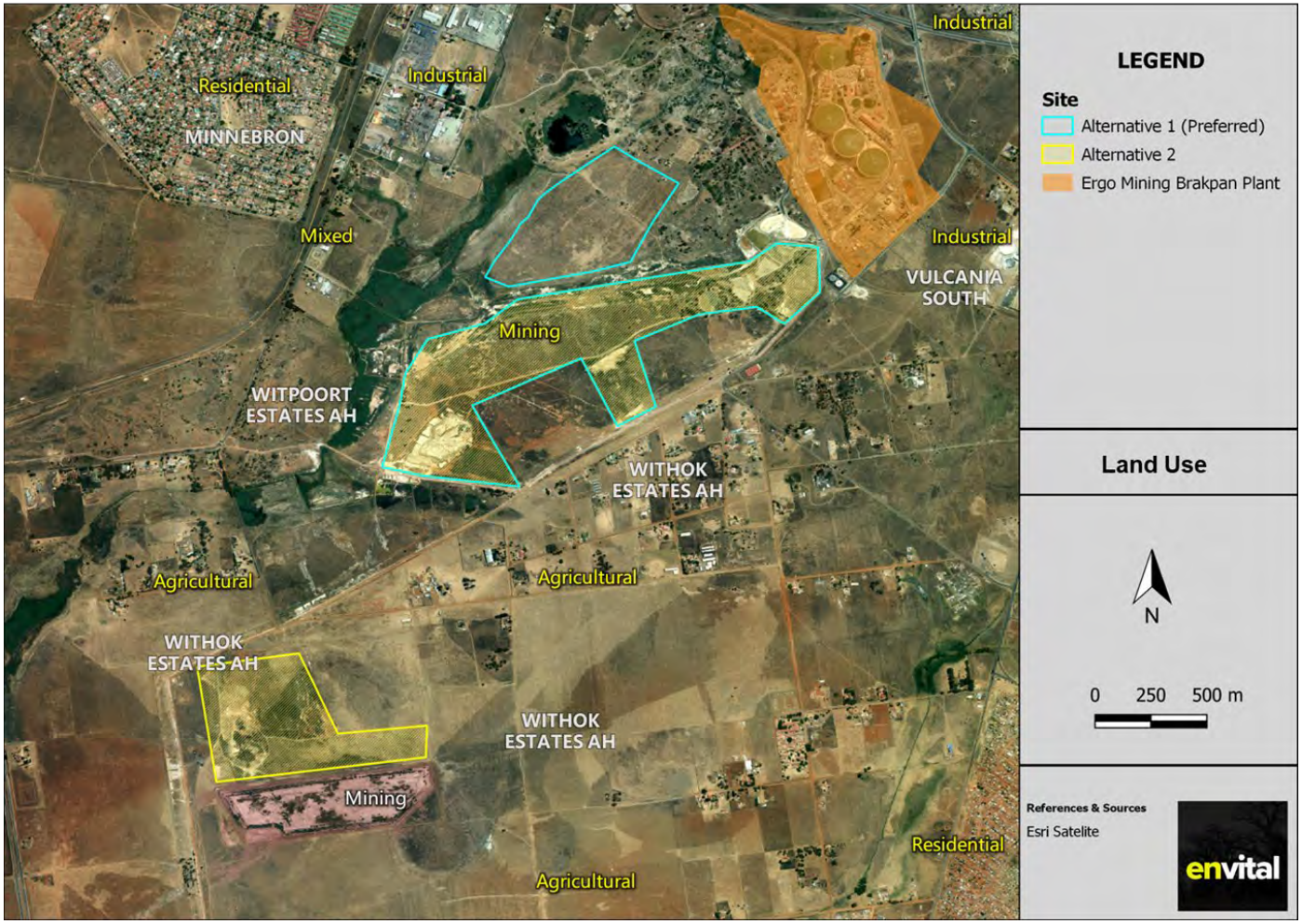


Figure 64: Current land use map: Broad land use near the proposed project site

v. IMPACTS AND RISKS IDENTIFIED

In order to calculate the significance of an impact, probability, duration, extent and magnitude will be used. The pre- and post-mitigation scores will provide an indication of the extent to which an impact can be mitigated.

This section summarises the potential impacts associated to the three different phases of the proposed Ergo SEF. The potential impacts and risks are explored by investigating each aspect associated to the proposed activities. The significance of each potential impact is then rated by considering the probability, the duration of the impact/activity, the extend of the impact, and the magnitude according to the methodology described in section vi) of this document.

For the purpose of this section, the mitigation measures recommended will only summarise the approach taken to manage each risk. A detailed mitigation plan is provided in Part B of this report.

The identified impacts on environmental and social receptors arising from the proposed development include direct, indirect, cumulative and residual impacts. Impacts are also linked to the different stages of the project which are identified as Design and pre-construction, construction, operation, decommissioning and rehabilitation. During the Environmental Impact Assessment process, discussions were held with DMRE and GDARD regarding the specialist studies. The following specialist reports are included in this EIR as they were likely to have significant potential impacts:

- Appendix E: Flora Terrestrial biodiversity Impact Assessment
- Appendix F: Fauna Terrestrial biodiversity Impact Assessment
- Appendix G: Avifauna Impact Assessment
- Appendix H: Surface Water Assessment and Storm water management Impact Assessment
- Appendix I: Wetland Impact Assessment and Aquatic Impact Assessment Impact Assessment
- Appendix J: Soils, land capability and agricultural potential Impact Assessment
- Appendix K: Heritage Impact Assessment
- Appendix L: Palaeontological Impact Assessment
- Appendix M: Visual Impact Assessment
- Appendix N: Socio-economic Impact Assessment
- Appendix O: Traffic Impact Assessment

The impacts tables from the specialists are included in the below sections.

Flora Terrestrial biodiversity

The proposed panel layout of the Preferred sites is indicated in Figure 65 below. The panel layout respects the flow of the Withokspruit, however, the artificial dam area (*Eragrostis plana* moist grassland) on Prt 183 of the Farm Witpoortje, will be destroyed. Table 21 compares the impacts on sensitive features between the Preferred and Alternative site.

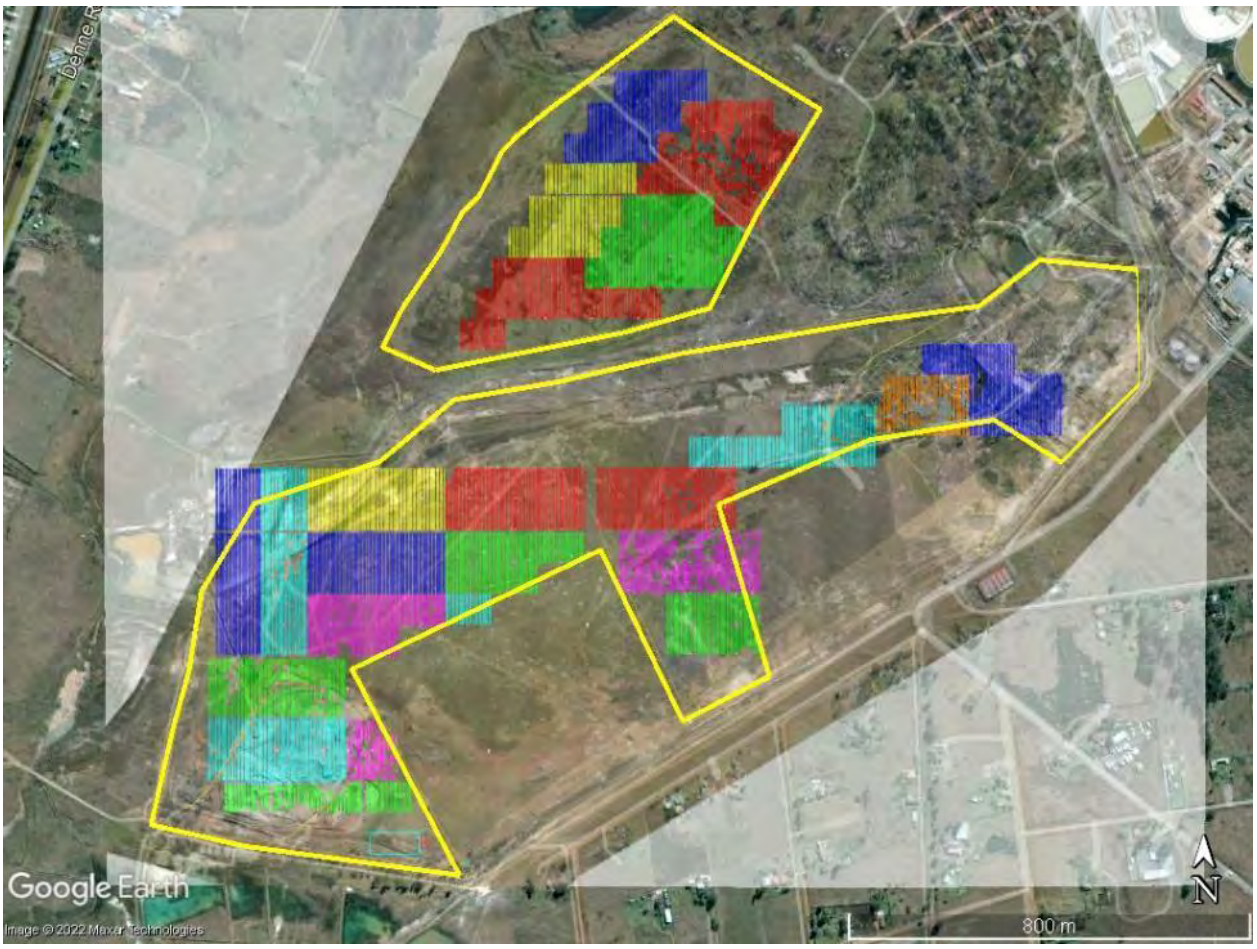


Figure 65: Estimation of the proposed panel layout on the Preferred site, overlaid onto Google Earth imagery. Note there is a data error of about 50m on the map, all panels must be developed within the site boundary marked by the yellow polygon.

Table 21: Comparison of sensitive features between the Preferred and Alternative site

Feature considered	Preferred sites	Alternative sites
CBA	Small portion present on Prt 272 of the Farm Witpoortje. The area comprised secondary grassland	Small portion on western boundary of Prt 9 of the Farm Withok. The area comprised secondary grassland
ESA	Most of Prt 272 of Witpoortje. The area comprised secondary grassland	The entire Prt 9 of Withok. The area comprised secondary grassland
Sensitive vegetation	Phragmites autralis moist grasslands. No direct impacts are envisaged Eragrostis plana moist grassland (artificial dam) will be destroyed by panelling	The Andropogon eucomus moist grassland will be destroyed. This is likely an artificial depression and the wetland assessment recommendations must be adhered to Eragrostis plana moist grassland is present within the eastern 50m buffer. No direct impacts are envisaged.

Feature considered	Preferred sites	Alternative sites
Threatened plant species	None recorded and none expected to be present.	None recorded and none expected to be present.
Provincially protected plants	None recorded	One individual of a Habenaria species (orchid) was recorded.

The impacts on the Preferred and Alternative sites are comparable with the greatest impact on moist grasslands. The wetland assessment must be consulted for the definitive boundaries of wetlands. No plant species of conservation concern were recorded in the moist grasslands and therefore the wetland specialist recommendations and buffers take preference. One protected plant species was recorded within the secondary grassland on the Alternative Site.

Although the impacts are comparable, the Vegetation report (Appendix E) motivates the approval of the Preferred Sites. Development on the Preferred Sites will concentrate the proposed activities in an area adjacent to the current mining activities and infrastructure. This will reduce edge effects to natural areas, as well as fragmentation of larger, connected open spaces. Development on the Alternative Site will fragment a larger open space that comprise of secondary and good condition grassland (Phase 1 assessment, Dimela Eco Consulting, 2021). The Alternative site is also closer to good condition grassland and moist grassland present in the Withok Estates Agricultural holdings north of the Alternative Site. If for any reason the Preferred Site is not approved, the vegetation spcialist has no objection with the Alternative site being used.

The additional access road to access Portion 272 of the Farm Witpoortje 117 via 17th Road may impact on some secondary grassland as it enters the PV block. Satellite imagery suggest that the vegetation was impacted on historically as it is adjacent to a sports field and historically cultivated land (refer to Figure 32). It is highly unlikely that plant species of conservation concern are present in this area and therefore the vegetation report does not object to the utilisation of this exisitng road via 17th Road.

Table 22: Destruction of natural vegetation of medium sensitivity (moist grasslands)

Activity:	Clearing of vegetation at construction footprints				
Impact:	Destruction of natural vegetation (moist grassland): • Edge effects e.g. heavy vehicles turning in adjacent areas; and • Storage of equipment within vegetation • Construction of elevated access over wetland				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-Mitigation	2	2	8	4	48 Moderate
Post-Mitigation	2	1	4	3	21 Low

Is the Impact Reversible?	Impact on moist grassland is difficult to rehabilitate and can impact on its functional role. Therefore, these areas must be avoided, or impacts managed as per the recommendations of the wetland assessment report.
Mitigation Measures:	Planning: • Do not plan any construction camps or laydown areas within the sensitive moist grassland or grassland vegetation that was not assessed by this report. Construction: • An independent Ecological Officer (EO) or Environmental Control officer (ECO) should be appointed to oversee construction. No go areas can be demarcated prior to commencement of works as per recommendations of ecological specialist. • A temporary fence or demarcation must be erected around the construction area (include the servitude, construction camps, areas where material is stored and the actual footprint of the development) to prevent access to sensitive environs. • Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area. • No open fires are permitted within naturally vegetated areas. • Make use of existing roads and tracks. • Do not dump litter or construction material within any vegetated areas. Operation and Maintenance: • After construction, the land must be cleared of rubbish (refuse, waste material and litter), surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction. • Ensure that maintenance work does not take place haphazardly, but according to a fixed plan. • Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. • Address erosion, applying soil erosion control and bank stabilisation procedures as needed.
Cumulative impacts:	• Degradation of watercourses and fragmentation of open spaces. • Increase in similar developments.
Residual impacts:	• Trampling of surrounding grassland vegetation. • Degradation due to edge effects • Localized alteration of soil surface characteristics and loss of flora, possible increased fragmentation of remaining natural grassland. • If mitigation measures are adequately undertaken, the residual risk is low.
Climate Change:	NA

Table 23: Destruction of modified vegetation of low sensitivity

Activity:	Clearing or disturbance to vegetation at construction footprints
Impact:	Destruction of modified and secondary vegetation: • Clearing of and damage to vegetation in construction footprint, access roads, construction camps, vehicle / machinery traffic and trampling by workers

<table>
<tr><td></td><td colspan="5">• Illegal disposal and dumping of construction material such as cement or oil, as well as maintenance materials during construction;
• Edge effects e.g. heavy vehicles turning in adjacent areas;
• Storage of equipment within vegetation; and
• Maintenance vehicles driving within natural or rehabilitated vegetation, not impacted on during the construction, will lead to the destruction of naturally occurring vegetation and compaction of soils and subsequent erosion or colonisation by alien invasive plant species. In addition, failed rehabilitation could lead to soil erosion during rainfall events and flooding</td></tr>
<tr><td>Significance rating:</td><td>Duration</td><td>Extent</td><td>Magnitude</td><td>Probability</td><td>Significance</td></tr>
<tr><td>Pre-Mitigation</td><td>2</td><td>2</td><td>4</td><td>5</td><td>40 Moderate</td></tr>
<tr><td>Post-Mitigation</td><td>2</td><td>1</td><td>2</td><td>5</td><td>25 Low</td></tr>
<tr><td>Is the Impact Reversible?</td><td colspan="5">Yes, modified, and secondary vegetation can be re-established.</td></tr>
<tr><td>Mitigation Measures:</td><td colspan="5"><u>Planning</u>:
• Keep the development footprint as small as possible to make sure the vegetation remains functional. This will ensure that the surrounding vegetation can serve as a seedbank for the disturbed areas.

<u>Construction:</u>
• An independent Ecological Officer (EO) or Environmental Control Officer (ECO) should be appointed to oversee construction. No go areas can be demarcated prior to commencement of works as per recommendations of ecological specialist.
• Keep the development footprint as small as possible.
• A temporary fence or demarcation must be erected around the construction area (include the servitude, construction camps, areas where material is stored and the actual footprint of the development) to prevent access to sensitive environs.
• Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area.
• No open fires are permitted within naturally vegetated areas.
• Make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas.
• A vegetation rehabilitation plan should be implemented at the start of construction. The modified grassland can be removed as sods and stored within modified areas – remove alien invasive vegetation prior to storing grasslands sods in transformed areas. The sods must preferably be removed during the winter months and be replanted by latest springtime. The sods should not be stacked on top of each other. Once construction is completed, these sods should be used to rehabilitate the disturbed areas from where they have been removed. In the absence of timely rainfall, the sods should be watered well after planting and at least twice more over the next 2 weeks.
• Grass species, typical of the Highveld Grasslands can be sown in prepared soils. Revegetation should take place successively to re-establish vegetation as soon as possible after construction in a specific area.
• Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority.
• Where topsoils need to be removed, store such in a separate area where such soils can be protected until they can be re-used for post-construction rehabilitation.</td></tr>
</table>

	• Never mix topsoils with subsoils or other spoil materials • Maintain site demarcations in position until the cessation of construction work. • After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction. <u>Operation and Maintenance:</u> • After construction, the land must be cleared of rubbish (waste material, refuse or litter), surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction. • Ensure that maintenance work does not take place haphazardly, but according to a fixed plan. • Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. • Address erosion, applying soil erosion control and bank stabilisation procedures as needed. • Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. • Delay the re-introduction of livestock (where applicable) to all rehabilitation areas until an acceptable level of re-vegetation has been reached. • Maintain vegetation under PV panels.
Cumulative impacts:	• Degradation of watercourses. • Increase in similar developments.
Residual impacts:	• Degradation due to edge effects • Localized alteration of soil surface characteristics and loss of flora, possible increased fragmentation of remaining natural grassland • If mitigation measures are adequately undertaken, the residual risk is low.
Climate Change:	NA

Table 24: Exposure to erosion and subsequent sedimentation or pollution of proximate moist grassland

Activity:	Clearing of vegetation at construction footprints, access roads and lack of rehabilitation. Possible impacts can arise during maintenance
Impact:	The removal of surface vegetation will expose the soils, which in rainy events would wash down into moist grasslands and rivers, causing sedimentation. In addition, indigenous vegetation communities are unlikely to colonise eroded soils successfully and seeds from proximate alien invasive plant species can spread easily into these eroded soils. After construction, a lack of rehabilitation or failed rehabilitation will result in bare soils that are susceptible to erosion. Furthermore, maintenance vehicles could disturb rehabilitated areas which could lead to soil erosion, habitat modification, trampling of vegetation as well as the destruction of protected plants and plants of conservation concern. The sources of this impact include: • Removal of vegetation upslope of the moist grassland, without proper rehabilitation or failure of rehabilitation; • Access roads, especially on slopes, and over the *Phragmites australis* moist grasslands; • Maintenance vehicles disturbing rehabilitated areas;

<table>
<tr><td></td><td colspan="5">• Spillages of construction material and harmful chemicals; and
• Failure of rehabilitation of the construction footprint.</td></tr>
<tr><td>Significance rating:</td><td>Duration</td><td>Extent</td><td>Magnitude</td><td>Probability</td><td>Significance</td></tr>
<tr><td>Pre-Mitigation</td><td>2</td><td>2</td><td>8</td><td>4</td><td>48 Moderate</td></tr>
<tr><td>Post-Mitigation</td><td>2</td><td>1</td><td>4</td><td>3</td><td>21 Low</td></tr>
<tr><td>Is the Impact Reversible?</td><td colspan="5">Yes, however, rehabilitation activities are costly</td></tr>
<tr><td>Mitigation Measures:</td><td colspan="5"><u>Planning:</u>
• Where possible, no construction / activities should be undertaken within the moist grasslands. The extent of wetland conditions should be verified by a wetland specialist and no activities should take place within these areas without that a Water Use License was granted by the Department of Water and Sanitation (DWS) for these activities.

<u>Construction:</u>
• Do not allow erosion to develop on a large scale (e.g., beyond the initial onset of erosion) before acting.
• Make use of existing roads and tracks where feasible, rather than creating new routes through grassland areas.
• Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005).
• Runoff from roads must be managed to avoid erosion and pollution problems.
• Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. The grassland can be removed as sods and re-established after construction is completed.
• Colonisation of the disturbed areas by plants species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study area.
• Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.
• Prevent spillage of construction material, oils or other chemicals, strictly prohibit other pollution. Ensure there is a method statement in place to remedy any accidental spillages immediately.
• After construction clear any temporarily impacted areas of all foreign materials, re-apply and/or loosen topsoils and landscape to surrounding level.

<u>Operation and Maintenance:</u>
• Do not disturb soil unnecessary during maintenance.
• Ensure maintenance work does not take place haphazardly, but according to a fixed plan.
• Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access.
• Monitor rehabilitation and ensure that rehabilitated areas do not erode.</td></tr>
</table>

	• If monitoring finds that indigenous vegetation from the surrounding grasslands is not colonising the site, implement a re-vegetation plan to ensure that grass species that naturally occur in the Tsakane Clay Grassland, are sowed to re-establish indigenous plant cover. • Monitor rehabilitation and delay the re-introduction of livestock (where applicable) to all rehabilitated areas until an acceptable level of re-vegetation has been reached. • Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.
Cumulative impacts:	• Erosion of the development footprint upslope from the moist grasslands could increase sedimentation in already degraded watercourses in the area. However, this could be mitigated. • Possible erosion of areas lower than the access roads, possible contamination of wetlands and/or groundwater reserves due to hydrocarbon or other spillage and an increase of modified areas (together with surrounding developments) that will affect flora population dynamics and runoff patterns
Residual impacts:	• A risk that heavy rain and flooding could erode the base of structures, or the subsequent removal or destruction of the vegetation by other land uses do remain.
Climate Change:	• Loss of biodiversity and soil condition that buffer climate change

Table 25: Removal / Destruction of protected plants and plants of conservation concern

Activity:	Construction and possibly maintenance				
Impact:	Provincially protected or threatened plants and their habitat could be impacted.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-Mitigation	2	2	8	4	48 Moderate
Post-Mitigation	2	1	4	3	21 Low
Is the Impact Reversible?	No threatened species was recorded. Provincially protected species on the Alternative Site can be relocated.				
Mitigation Measures:	<u>Planning:</u> • If the development proceeds on Prt 9 of the Farm Withok (Alternative Site), the *Habenaria* species should be identified in its flowering period (likely March). • Apply for a permit from the GDARD to remove the species. • The species must be relocated in accordance with a relocation and monitoring plan. <u>Construction:</u> • The EO / ECO should take note of any unearthed geophytes or orchids and contact a specialist for the correct naming and threat status of the species. This will determine whether any follow-up action is required.				

Cumulative impacts:	If mitigation measures are adequately implemented, no cumulative impacts are expected.
Residual impacts:	Trampling during maintenance
Climate Change:	NA

Table 26: Potential increase in invasive vegetation

Activity:	Disturbed soils due to construction and trampling				
Impact:	The seed of alien invasive plant species that occur on and in the vicinity of the construction areas could spread into the disturbed and stockpiled soil. Also, the construction vehicles and equipment were likely used on various other sites and could introduce alien invasive plant seeds or indigenous plants not belonging to this vegetation unit to the construction site. In addition, if rehabilitation of the indigenous vegetation along the route are unsuccessful or is not enforced, exotic and invasive vegetation may invade the area.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-Mitigation	2	2	6	4	40 Moderate
Post-Mitigation	2	1	4	3	21 Low
Is the Impact Reversible?	Yes, however, rehabilitation activities are costly and can take several years to clear invasive species and destroy their seedbank.				
Mitigation Measures:	Planning: • Alien invasive species, in particular category 1b species that were identified within the study area (Dimela Eco Consulting, 2021), should be removed from the development footprint and immediate surrounds, prior to construction or soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation. • Manual removal is preferred to chemical control, particularly in the moist grassland. • Only suitably trained contractors (e.g. certified by the South African green Industries Council (SAGIC)) with knowledge of the species in question should be employed. • All alien seedlings and saplings must be removed as they become evident for the duration of construction. • All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the construction areas. This should be verified by the ECO. • If filling material is to be used, this should be sourced from areas free of invasive species. Construction: • Implement an alien invasive plant monitoring and management plan whereby the spread of alien and invasive plant species into the areas disturbed by the construction are regularly removed and re-infestation monitored				

Cumulative impacts:	Several invasive species are present within the area that the proposed development is situated in. Therefore, if mitigation measures to limit and prevent the spread of alien species are not implemented, the cumulative impact could lead to remaining natural vegetation transformed by alien plant species.
Residual impacts:	Re-infestation in areas initially cleared.
Climate Change:	Loss of biodiversity that buffer climate change

Table 27: Compaction and destruction of soils

Activity:	Clearing of vegetation and soil disturbance.				
Impact:	The movement of heavy machinery over vegetated areas during construction and maintenance will result in soil compaction that will modify habitats, destroy vegetation, and inhibit re-vegetation. Soil compaction because of vehicles and traffic, could lead to a decrease of water infiltration and an increase of water runoff. Such areas are more likely to be colonised by pioneer, alien invasive plant species, than indigenous species. This will further transform the vegetation of the area. The health of the topsoil is imperative for re-vegetation. Incorrect stripping, handling and storage could lead to failed rehabilitation.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-Mitigation	2	2	8	4	48 Moderate
Post-Mitigation	2	1	4	3	21 Low
Is the Impact Reversible?	Yes.				
Mitigation Measures:	Construction: • Vehicles and machinery may not veer from the dedicated roads. • Once construction is complete, obsolete roads should be obliterated by breaking the surface crust and erecting earth embankments to prevent erosion, while the natural species composition should be re-established. • Prior to construction, the topsoil must be removed and stored separately from subsoil. The topsoil is imperative for the successful re-establishment of indigenous vegetation and it carries seed from the existing vegetation. • Topsoil (the upper 25 cm of soil) is an important natural resource; where it must and can be stripped, never mix it with subsoil or any other material, store and protect it separately until it can be re-applied, minimise handling of topsoil. • Topsoil is typically stored in berms with a width of 150 – 200 cm, and a maximum height of 100 cm, preferably lower, ideally in a disturbed but weed-free area. Place berms along contours or perpendicular to the prevailing wind direction. • Rapid decomposition of organic material in warm, moist topsoils decreases microbial activity necessary for nutrient cycling, and reduces the number of beneficial micro-organisms in the soil. Therefore, topsoil should therefore not be stored for extensive periods, and it is recommended that the reapplication of topsoil takes place as soon as possible. Adhere to the following general rule: the larger the pile of topsoil storage needs to be, the shorter should be the time it is stored • Topsoil handling should be limited to stripping, piling (once), and re-application. • Any movement of heavy machinery or vehicles over stored topsoils must be strictly prohibited.				

	Maintenance: • Maintenance vehicles may not deviate from dedicated roads.
Cumulative impacts:	Failed rehabilitation and soil compaction could lead to a cumulative invasion by alien invasion plant species from the surrounding transformed vegetation that can easily spread into the compacted soils.
Residual impacts:	Altered soil characteristics and vegetation that remain in an unstable, pioneer phase or invaded by alien invasive plant species.
Climate Change:	Soil disturbances, resulting in a loss of biodiversity.

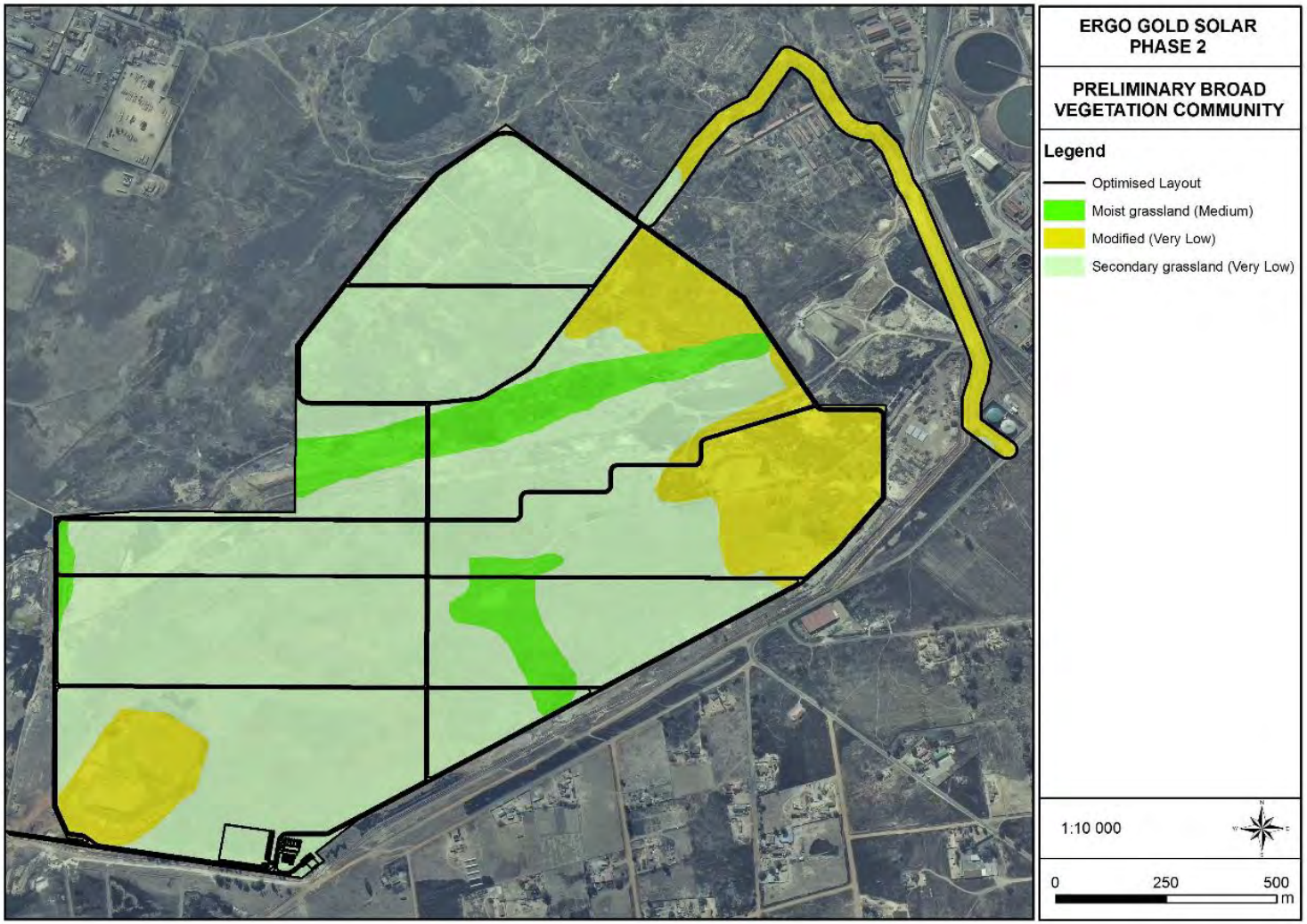


Figure 66: Optimized layout and vegetation sensitivity

Fauna Terrestrial biodiversity

The following is relevant in terms of vertebrate fauna species:

- In terms of the mammals:
  - SCCs (Oribi and Spotted-necked Otter) are unlikely to occur within the project area for any length of time but may be present in the less disturbed surrounding habitats and may traverse the project area from time to time; considered possible species in the development areas. They are mobile species likely to move away from noise and human activity and unlikely to experience direct impact.
  - Three TOP species are maintained as likely to occur on site:
    - The Serval and Southern Reedbuck are linked to wetland habitats and associated reedbeds neighbouring the main development sites.
    - The disturbed nature of the terrestrial habitats reduces the likelihood of significant populations of the Southern African Hedgehog, but active monitoring for the species is required during the construction phase.
- In terms of herpetofauna:
  - No significant TOP herpetofauna populations are expected on the property.
  - The Giant Bullfrog, was the only TOP herpetofauna confirmed in the area along the Rietspruit Tributary, south of the alternative site. The species is threatened by loss and degradation of its wetland and neighbouring terrestrial habitat and effort must be made to conserve the species by way of maintaining the natural habitats and ecological corridors remaining in the area. In terms of the Phase 2 areas, the main potential area would be the wetland in the north and north-west of the project area which must be managed in accordance to the recommendations of the wetland specialist. Active monitoring must be undertaken for the species during construction phase.
- In terms of invertebrates
  - The Protected Baboon Spiders cannot be excluded from site, but it is expected that they would occupy the less disturbed habitats around site.
  - Despite several butterflies being confirmed on site, no *Aloeides dentatis dentatis* or similar species were noted on site. Populations of the butterfly are not expected to occur on the development sites.

Site Ecological Importance & Site Sensitivity

No Site Ecological Importance assessment was completed as no adequate habitat was noted for the relevant trigger SCCs (none of the areas will be critical to the survival or conservation of SCC populations) and no other SCC populations were identified as likely to occur within the proposed development areas.

In general, the overall site sensitivity is in partial agreement with the Gauteng conservation plan, in terms of terrestrial fauna (Figure 67). Where CBAs overlap natural habitat units, wetlands and areas most likely utilised by the more sensitive terrestrial fauna, these have been designated as highly sensitive areas. Where CBAs / ESAs have intersected disturbed habitat areas, then these have been designated as

moderately sensitive areas where ecological function is still provided to terrestrial fauna (habitat provision, ecological corridor or water provision). The bulk of the sites are designated as low sensitivity due to the modified and / or disturbed nature of the areas.

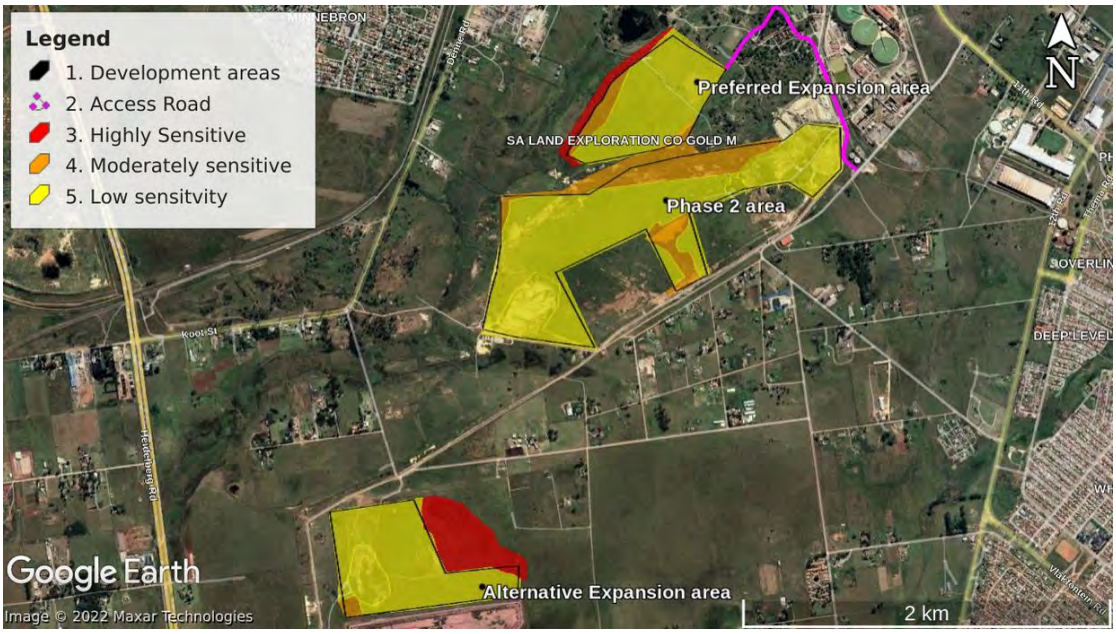


Figure 67: Fauna Site Sensitivity

In terms of the fauna biodiversity and animal species findings, the following impacts could be significant during construction phase and have been assessed further:

- Destruction of fauna habitat, specifically potential TOPS habitat (designated highly sensitive areas).
- Hindering or interfering with TOP fauna species that may traverse through the project area.
- Contaminated or silt-loaded runoff to on-site and nearby aquatic ecosystems within the project area.
- Impacts have been identified to be, at most, of moderate significance and can all be mitigated to low impact with vigilant activity and good house-keeping practices on site.

Table 28: Potential destruction of sensitive fauna habitat

Activity:	Solar Panel Construction and to a lesser extent edge affects during Operational Phase (both alternatives)				
Impact:	For areas designated as low sensitivity the impact is not significant in terms of fauna. The highly and moderately sensitive areas provide less disturbed habitats, improve habitat diversity and provisions for fauna; activities in these areas must be reduced and / or managed.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Construction					

Pre-Mitigation	3	2	8	4	52 Moderate
Post-Mitigation	1	1	2	2	8 Low
Operation					
Pre-Mitigation	3	1	4	2	16 Low
Post-Mitigation	1	1	2	2	8 Low
Is the Impact Reversible?	Reversible: Requires some mitigation and rehabilitation to ensure reversibility, but most areas are disturbed				
Mitigation Measures:	STOP: No activities are to commence within the waterways until authorisations are obtained under the National Water Act (NWA) and NEMA. No activities are to take place in areas designated as highly sensitive (refer to sensitivity map), pending the recommendations of the wetland specialist and until the authorisations are obtained under the National Water Act (NWA) and NEMA. MODIFY: Low sensitivity areas must be targeted for all supporting infrastructure / facilities. Medium sensitivity areas should be targeted for open space and green spaces with reduced development footprints (<50%) in these areas (utilise for panels, as grassy drainage areas / paths, etc.). Where fencing around structures is required, these must enclose the discrete footprints of infrastructure areas and not sever connectivity within and between highly sensitive areas. Any fences (including Clearvu) or walls can be considered for enclosing discrete footprint areas (immediately around the infrastructure). Fencing across open spaces and across wetland areas must be palisade or similar fencing that allows the free movement animals (Clearvu not considered appropriate in terms of this) and not wire mesh or barbed wire (materials which could ensnare animals). The gravel road crossing the Rietspruit Tributary should not be utilised by any construction vehicles during the rainy season if the bullfrogs are observed to be active near the area (as per Environmental Control Officer's monitoring duties). Plan and implement a proper storm-water management plan from the onset to prevent excessive runoff and associated erosion and sedimentation in downstream habitats. CONTROL: Peg out and demarcate areas for development and no-go areas before commencing with any activities. No activity whatsoever should occur in no-go areas. REMEDY: Where areas not targeted for development are inadvertently impacted and / or damaged, clear any material dumped and rehabilitate the site as soon as possible.				
Cumulative impacts:	Generally, the cumulative loss of habitat will reduce species richness and biodiversity. In this highly disturbed area the impact is not seen as significant as long as undisturbed areas remain in their current state.				
Residual impacts:	Although only a single TOP species was confirmed, it is possible that the natural habitat units support some TOP species. Therefore, the loss of remaining undisturbed habitats within the area may mean a decrease and potential loss of TOP species in the area.				
Climate Change:	Climate change status for Gauteng is not expected to change significantly due to the proposed development, although carbon emissions may be reduced due to the proposed development. No additional regional or national climate change impacts expected on terrestrial fauna.				

Table 29: Hindrance, trapping, killing of fauna, focussing on potential TOP species in the project area

Activity:	Solar Panel Construction and to a lesser extent Operational Phase (both alternatives)				
Impact:	TOP species may wonder into the project area periodically.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Construction					
Pre-Mitigation	2	2	6	3	30 Moderate
Post-Mitigation	2	2	4	2	16 Low
Operation					
Pre-Mitigation	3	2	4	2	18 Low
Post-Mitigation	1	2	2	2	10 Low
Is the Impact Reversible?	Moderately Reversible: Requires mitigation and rehabilitation to ensure reversibility				
Mitigation Measures:	STOP: No poisons against fauna are to be brought on site; where this is not possible any substance that could be toxic to fauna will be stored and handled in a manner that will prevent exposure of the substance to the environment. No deliberate killing or trapping of indigenous fauna is allowed on site. CONTROL: Environmental awareness training must include the prohibition of any harm or hindrance to any indigenous fauna species and the consequences of such actions. Ensure safe speed limits and safe working conditions in the project area. REMEDY: Contracts with contractors must specify actions that will be taken against contractors who do not conduct activities in line with the EMPr. Should any fauna be trapped within the development area (specifically the South African Hedgehog), activities will cease and adaptive management applied (allow animals to freely leave the area); specialists will be brought in to safely remove the animals from site in line with the Gauteng Nature Conservation Ordinance if deemed necessary. Monitor TOPS observed to enter the site, specifically the areas around the non-perennial tributary and Rietspruit Tributary during rainfalls for Giant Bullfrog activity. Should monitoring indicate that aspects of the development are posing a risk to these species, then activity will be ceased or management must be adapted to protect these species. Any requirements of the Gauteng Nature Conservation Ordinance will be complied with regarding handling of such species.				
Cumulative impacts:	Local extinctions that could be caused by cumulative destruction of TOPS will alter the faunal community structure (for example the prey-base may bloom, or competitive predator numbers could decline). Predicting the extent and significance of such changes is not possible, although is not expected to be severe in terms of this area.				
Residual impacts:	Destruction of any TOPS (or prey-base of TOPS) could cause a cascade affect on populations and, in extreme circumstances, local extinctions.				

Climate Change:	No climate-change related impacts expected.

Table 30: Contamination of fauna environment

Activity:	Solar Panel Construction and to a lesser extent Operational Phase (both alternatives)				
Impact:	The proximity of the project area to various water bodies and tributaries means that any contamination in the project area will find its way into the streams and aquatic environments during a rainfall event.				
Significance rating	Duration	Extent	Magnitude	Probability	Significance
Construction					
Pre-Mitigation	3	2	6	5	55 Moderate
Post-Mitigation	2	1	4	2	14 Low
Operation					
Pre-Mitigation	4	2	4	2	20 Low
Post-Mitigation	4	1	4	2	18 Low
Is the Impact Reversible?	Moderately Reversible: Requires mitigation and rehabilitation to ensure reversibility				
Mitigation Measures:	STOP: Discontinue use of all faulty machinery / equipment on site until properly repaired. No activities are to commence within the streams, wetlands and buffers until the necessary authorisations are obtained under the National Water Act (NWA). Ensure a waste management plan has been compiled in line with the National Environmental Management: Waste Act (NEM:WA) before any activities commence on site. MODIFY: Due to proximity of petrol stations, hydrocarbon storage on site should be limited to daily needs only. Plan and implement a proper storm-water management plan from the onset. Facilities will be provided for storage of all hazardous substances and waste to prevent the exposure of these substances to the environment. The aim is to PREVENT exposure of fauna to any potential toxin. CONTROL: All equipment / machinery will be serviced and maintained within operating specifications to prevent the risks of leaks. Repairs to vehicles will be conducted off-site. All substances including waste must be properly stored and handled according to prescribed manner / standards and must not be exposed to the environment and sheltered from environmental elements. Any cars, machinery or equipment parked on site will either be parked on a concrete slab or have pans placed under them to collect all drips and potential leaks. Manage all waste in line with the waste management plan. Cement bags will be stored under a tarpaulin and on an impervious sheet. Cement mixing will take place within a designated area only.				

	REMEDY: All hydrocarbons spills on bare ground will be cleared immediately. Inspect and clear all litter and waste from the site and surrounds. All dry and wet cement spills on bare ground will be cleared immediately.
Cumulative impacts:	Any additional development will add to the potential of contamination to the area and down-slope areas. Large spills or continuous cumulative leaks and waste dumping that are not cleaned up will enter the environment through run-off or leachate and contaminate the environment.
Residual impacts:	If toxic substances and waste are not properly managed or spills not cleared immediately, the environment will suffer extended residual impacts, particularly if toxins seep into the soils or are washed to downstream environments. No impacts with proper on-site management.
Climate Change:	Although there will be an initial increase in diesel-powered vehicles and machinery contributing to elevated carbon emissions, this will be temporary, and overall long-term carbon emissions may be reduced in the area due to the proposed development.

Avifauna

A quantitative methodology was used to describe, evaluate and rate the significance of the impacts associated with the construction, operation and decommissioning of the proposed Ergo SEF and its ancillary infrastructure. This assessment is presented in tabular format below for both pre- and post-mitigation. The potential impacts of the proposed Ergo SEF and its ancillary infrastructure on the avifaunal community have been assessed separately given the characteristics of each development.

One of the objectives of the avifauna was to determine the preferred PV SEF development layout that poses the least impact to the avifaunal community, particularly the sensitive SCC present within the study area. The two alternatives that have been proposed for the 40MW SEF i.e. Preferred Layout and Alternative Layout occur within the same pentad. They are comprised of identical vegetation units and subjected to similar existing disturbances associated with the land use practices in the area and are therefore likely to be identical in terms of species diversity and density too. With this in mind, the selection of a preferred Site Layout has been determined using observations of available micro habitat, species occurrence and the location of the Site Layouts in relation to existing infrastructure.

Sensitive features present within the PAOI include the river systems, waterbodies, wetland areas and breeding locations to the north-west, west and south of the proposed SEF layout boundaries (Figure 68). The river and wetlands have been buffered by 100m and assigned a HIGH sensitivity rating, owing to the degree of connectivity with other ecosystems and their suitability to support African Grass Owl and African Marsh Harrier. The African Marsh Harrier breeding and foraging habitat is buffered by 100m and assigned a HIGH sensitivity rating. Similarly, the African Grass Owl breeding location has been buffered by 100m and assigned a HIGH sensitivity rating in accordance with GDARD requirements. Suitable foraging habitat occurs on the neighbouring properties for those priority SCC whose distribution overlaps with the proposed development areas – this habitat has been assigned a MEDIUM sensitivity rating (Figure 69). The remaining areas earmarked for the proposed development are heavily transformed and considered to be of LOW sensitivity.

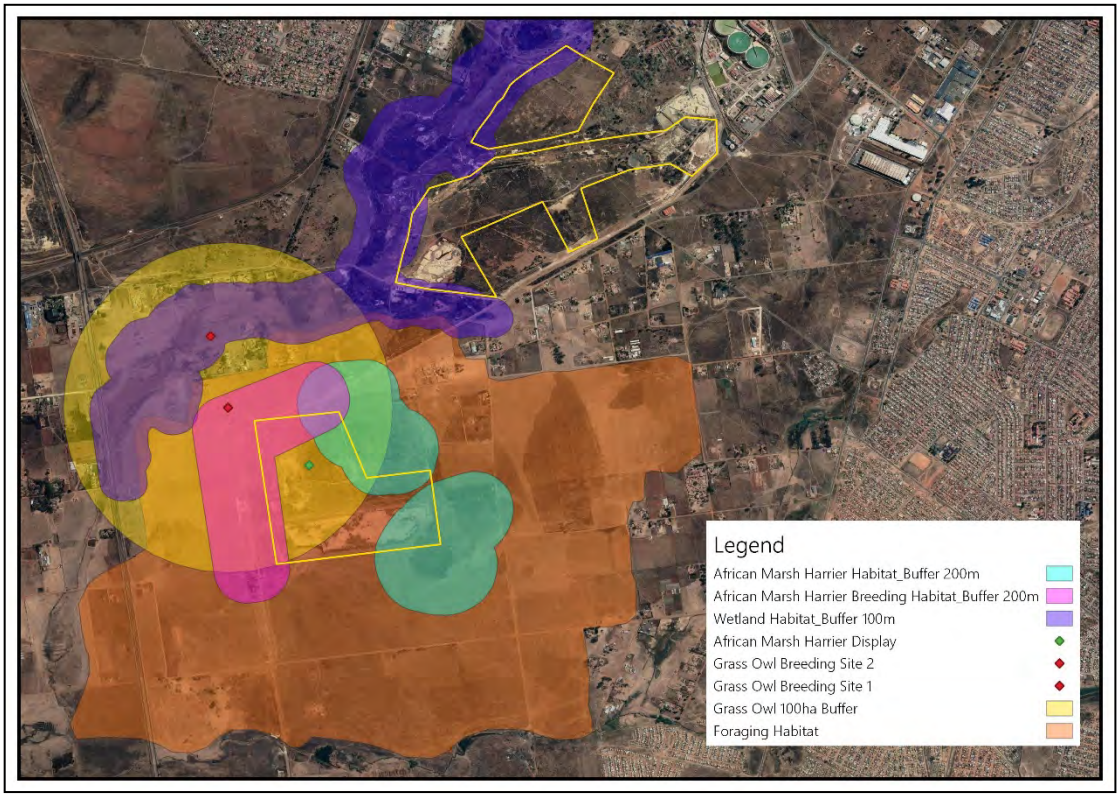


Figure 68: Key avifaunal sites and habitat requirements within the 40MW SEF development area and PAOI.

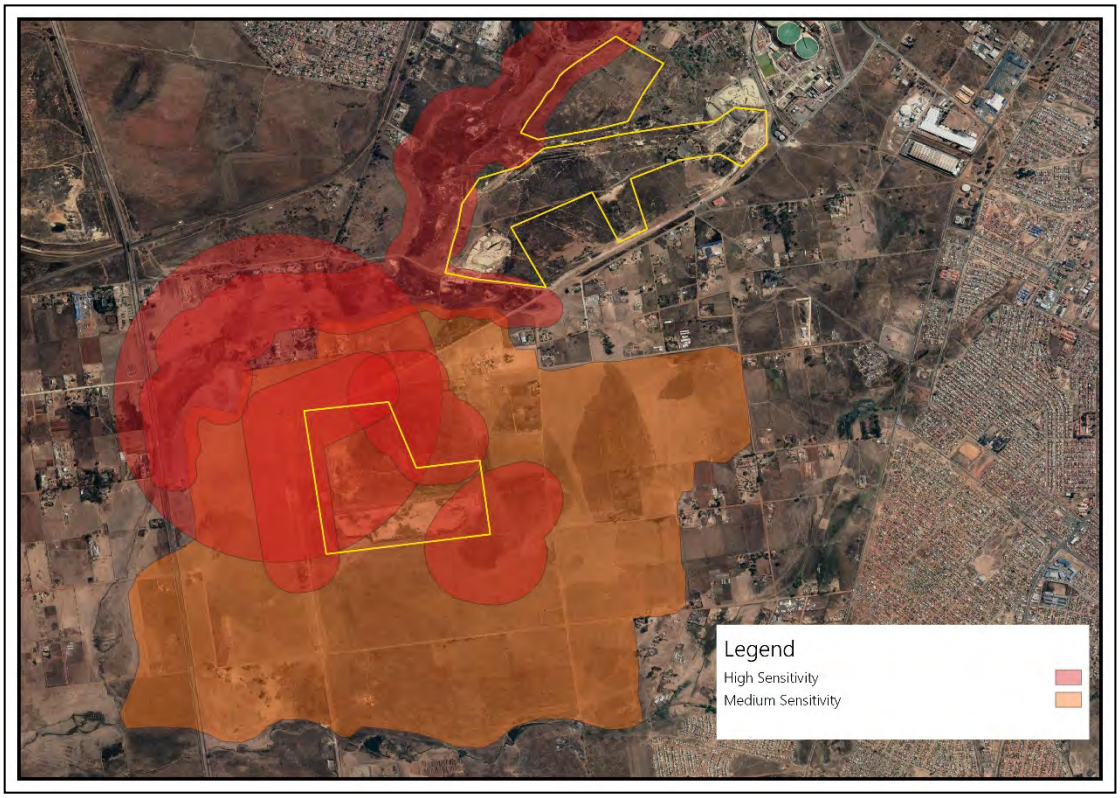


Figure 69: Avifaunal sensitivity within the 40MW SEF development area and PAOI.

The Preferred Layout avoids the areas of HIGH sensitivity within the PAOI, particularly the African Grass Owl and African Marsh Harrier breeding locations. The Preferred Layout also contains areas that are heavily transformed and subject to significant levels of existing habitat degradation and disturbance. It is on this basis that the **Preferred Layout is considered to pose the least impact** to the resident avifaunal community. The below tables

Table 31: Assessment of the habitat loss and/or transformation caused by the construction of the 40MW SEF

Activity:	Construction of the 40MW SEF				
Impact:	Displacement of SCC as a result of habitat loss and/or transformation				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Preferred Layout					
Pre-Mitigation	4	1	4	3	27 Low
Post-Mitigation	4	1	2	2	14 Low
Alternative Layout					
Pre-Mitigation	4	1	4	3	27 Low
Post-Mitigation	4	1	2	2	14 Low
Is the Impact Reversible?	• Medium reversibility – The removal of vegetation will be limited to the PV foundations.				
Mitigation Measures:	• Given the disturbed nature of the habitat and the absence of unique habitat features within the Preferred Layout, there is no specific mitigation required. • Construction activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species • All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment. • All temporary disturbed areas should be rehabilitated according to the site's rehabilitation plan, following construction.				
Cumulative impacts:	• Despite existing habitat transformation and disturbance, the PAOI does contain grassland and wetland habitats that are important to African Grass Owl, African Marsh Harrier and a variety of waterbird and passerine species and therefore the cumulative impact is deemed to be of moderate significance.				
Residual impacts:	• SCC and non-SCC passerine species may return once the construction activity is completed and the site rehabilitated, but it is unlikely that the numbers will recover to those recorded prior to the development due to the significant habitat transformation that will take place.				

Climate Change:	• N/A

Table 32: Assessment of the disturbance impact caused by the construction of the 40MW SEF

Activity:	Construction of the 40MW SEF				
Impact:	Displacement of SCC as a result of disturbance				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Preferred Layout					
Pre-Mitigation	1	2	6	3	27 Low
Post-Mitigation	1	2	4	2	14 Low
Alternative Layout					
Pre-Mitigation	2	2	8	4	48 Moderate
Post-Mitigation	1	2	6	3	27 Low
Is the Impact Reversible?	• Medium reversibility - After the construction activities, have ceased, the source of displacement will largely dissipate.				
Mitigation Measures:	• All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment. • Construction activity should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red Data species. • Measures to control noise should be applied according to current best practice in the industry.				
Cumulative impacts:	In addition to the proposed PV SEF arrays, there are several activities (i.e. mining, light industrial and urbanisation) that feature prominently both within the development area and the broader PAOI - a significant source of existing disturbance. These activities, coupled with the limited habitat diversity and degradation within the proposed development site, are a likely cause of the absence of SCC within the development area and the immediate area. Therefore the cumulative impact is deemed to be of high significance.				
Residual impacts:	• The majority of species observed in the study area may return once the construction activity is completed.				
Climate Change:	• N/A				

Table 33: Assessment of mortality due to collision with the PV panels

Activity:	Operation of the SEF (both alternatives)

Impact:	Mortality at PV facility (impact trauma on PV panels)				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-Mitigation	4	2	6	3	42 Moderate
Post-Mitigation	4	2	2	2	16 Low
Is the Impact Reversible?	• High reversibility - If the PV SEF is de-commissioned the collision risk will disappear				
Mitigation Measures:	• The PV panels should spend as little time as possible in a vertical position as this presents a greater collision hazard. • An operational monitoring programme, that includes carcass searches to provide an indication of fatality rates as a result of collisions, and if there are any spatial, temporal or conditional patterns to the frequency of collisions. • Most importantly, operational monitoring should highlight if mitigation (i.e. modifications to the panel design to reduce the illusionary characteristics of the panels) is required to reduce impacts to acceptable levels.				
Cumulative impacts:	• An extensive power line network features prominently within the immediate vicinity of the proposed study area. The addition of reflective PV panels will potentially increase the collision risk. Collisions with the proposed PV panels will have a medium cumulative impact.				
Residual impacts:	• It is envisaged that mitigation, if required, will reduce but not eliminate collision mortality.				
Climate Change:	• N/A				

Table 34: Assessment of habitat impacts associated with altered run-off and chemical pollution

Activity:	Operation of the 40MW SEF - particularly cleaning of the solar panels (both alternatives)				
Impact:	Habitat loss associated with altered run-off and chemical pollution				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-Mitigation	4	2	4	2	20 Low
Post-Mitigation	4	2	2	1	8 Low
Is the Impact Reversible?	• High reversibility - a robust water management plan will eliminate habitat loss				
Mitigation Measures:	• This will need to be managed through the development of a carefully considered surface water/drainage management plan for the site. • The surface water management plan should stipulate the use of environmentally friendly and acceptable cleaning products.				

Cumulative impacts:	• The surrounding area is already heavily transformed as a result of industrial and urban activities. Although relatively small in size, any additional loss of habitat as a result of altered runoff and the use of chemical pollutants is deemed to have a medium cumulative impact.
Residual impacts:	• Smaller passerine species may return once the construction activity is completed and the site rehabilitated.
Climate Change:	• N/A

Surface Water Assessment and Storm water management

The hydrological impact assessment covers impacts of flooding, the sedimentation and siltation of water courses as well as the alteration of the natural drainage patterns.

Storm Water Management Assessment

The proposed project development will alter the existing environmental state of the area (which is an old rehabilitated tailings facility with undulating terrain), thereby affecting the generation of storm water from its existing state. Volumes of storm water generated over disturbed areas are generally expected to increase because of the reduction in natural vegetation, while the quality of the storm water generated is expected to decrease (silt load).

These changes are, however, expected to be primarily associated with the construction and decommissioning phases of the project. The installation of PV panels mounted on concrete secured pylons/poles results in the majority of the land surface retaining its natural land-cover once rehabilitation has occurred (during the operational phase), with only the PV foundations representing a permanent change (during the operational phase). Additional associated project infrastructure such as roads, fences, lay down areas, offices etc will also alter the 'natural' or existing hydrological flow regime.

A simple conceptual storm water management plan has been developed for the solar PV area for both the phase 2 preferred and alternate layout option (refer to Figure 70). This was based upon delineated upstream contributing catchment areas being diverted (where possible) around the solar PV areas so as to reduce potential flooding and ponding of water. The conceptual storm water management plan also proposes the establishment of formalised channels to manage water generated upstream and within the proposed PV areas to be routed more effectively through the site. This will result in a more defined river channels with an associated ability to concentrate flooding, modelled on the basis of current terrain as defined by the 2m DTM. Additional flood protection berms have also been proposed for areas where flood risk is of concern, based on the model results. The phase 2 SWMP takes cognisance of the proposed SWMP for phase 1. All proposed infrastructure has been sized to effectively route up to the 1:50 year flood event. This may be a conservative approach for a solar PV plant, but it is located on a previously rehabilitated tailings facility on mining property hence the approach to design infrastructure in accordance with GN704.

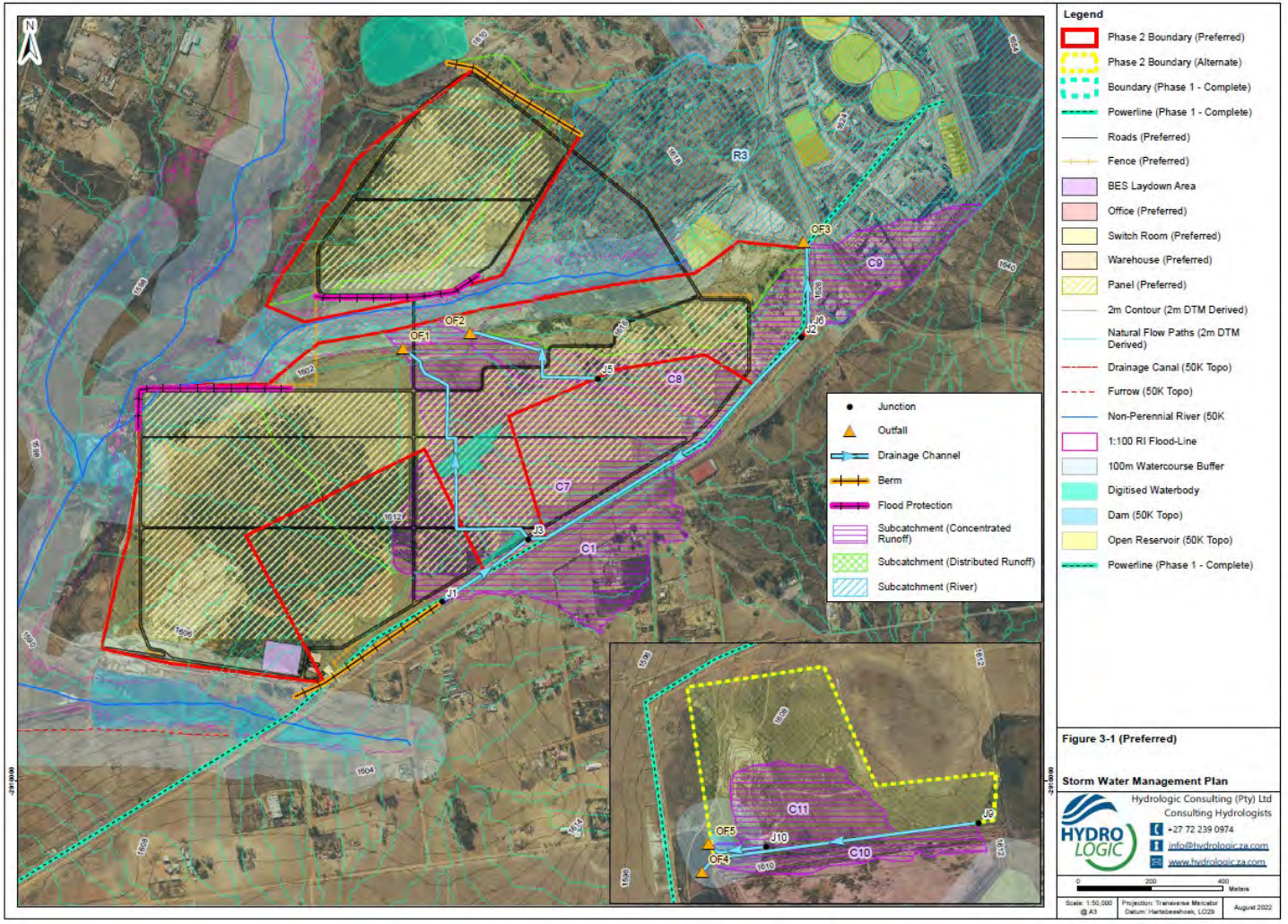


Figure 70: Storm Water Management Plan

Flood Assessment

In the hydrological assessment, rivers intersecting both the proposed powerline (from Phase 1) and the preferred and alternative sites (from Phase 1 and Phase 2) were selected for flood modelling. Flood modelling of relevant rivers utilised the 2m DTM and 30m DSM for the estimation of design hydrographs and the 2m DTM alone for the development of the hydraulic portion of the flood model.

The availability of a continuous 2m DTM allowed for the adoption of a 2D flood model approach. Unlike a 1D approach (using cross-sections) which samples the DTM at set cross-section locations, a 2D model approach uses a continuous model grid. The advantage of a 2D model is consequently its ability to account for more variation in the topographic data since no gaps are present in the model geometry (as is the case with cross-sections).

The 1:50 year and 1:100 year RI hydrographs representative of the design flows in the rivers of interest were estimated prior to the development of a hydraulic (flood) model. These hydrographs were subsequently applied to various reaches of the hydraulic model (seven inflow locations in total), which enabled the estimation of the 1:50 year and 1:100 year RI flood-lines and associated datasets for flood depth and velocity.

The latest layout of PV arrays are noted as falling outside the modelled 1:100 year RI flood-line, with infrastructure (site road) just touching this flood-line. This layout assumes flood-line accuracy, however, as outlined there are limitations to this accuracy. To assist in offsetting potential flood risk to the site, two flood protection berms are proposed for infrastructure closest to areas of flooding (a 20m buffer of the flood-line informed flood protection). These flood protection berms should be at least 1m high (in relation to the adjacent landscape).

If any infrastructure is to be positioned within the simulated flood-lines, it should be flood-compatible in nature (e.g. PV pylons with panels above the flooding). For flood sensitive infrastructure, an additional offset from the flood-line should be considered given the potential inaccuracies in the 2m DTM. There are two roads and a fence proposed as part of the preferred layout that intersect a non-perennial tributary of the Withokspruit, located between the two preferred boundary portions. A bridge design has been provided for these roads and is included in the Appendix C of the Hydrological report (Appendix H). No assessment of these two bridges has been considered with regards to their influence on flooding and their design is assumed to not alter the results of the flood modelling included in Hydrological report. Details of the design of this proposed infrastructure are such that they will allow for the free drainage of flows generated in this stream during flood events.

Having set out the preferred layout on the basis of the modelled flood-lines, it is noted that some proposed infrastructure passes through the 1:50,000 topographical map non-perennial tributary of the Withokspruit. A site survey confirming the route of the non-perennial river should be performed given the difference between the defined river location and the modelled flooding. If necessary, flood-lines can be re-modelled using more detailed elevation data (LiDAR) to improve model confidence.

Hydrological Impact Assessment

Hydrological impacts associated with the proposed solar PV development which have been identified in this assessment include flooding, sedimentation and siltation of water courses, as well as the alteration of natural drainage patterns and associated stream flow volumes. To this end, it is recommended that the silt load in the receiving water resources immediately downstream of the site be monitored prior to construction, during construction, as well as post construction. The significance rating for the construction and operational phases for both pre and post mitigation for the alternate and preferred site options have been considered in this assessment.

The storage/handling of fuel, lubricants and chemicals (where applicable) will require special attention due to their hazardous nature as is the case with the diesel and oil bay. These areas are required to be managed on impermeable floors with appropriate bunding, sumps and roofing.

Table 35: Impact Assessment: Flooding

Activity:	Construction/establishment, operation and decommissioning of PV facility				
Impact:	Potential flooding of proposed infrastructure following significant rainfall events may occur at the proposed site. The undulating terrain resulting from the previous rehabilitation of the old tailings facilities may lead to ponding as well as concentrated or distributed runoff (depending on upstream contributing catchment area) within the proposed PV array areas. Infrastructure placed in close proximity or across the tributary of the Withokspruit will be at risk of flooding during significant rainfall events due to the anticipated peak flows during events associated with a 1:50 and 1:100 year recurrence interval. Flooding will be exacerbated through the clearing of vegetation and associated exposure of the soil with increased runoff during such events. Flooding may lead to increased erosion and associated development of erosion gullies throughout the project area. Flooding may lead to the irreparable damage to infrastructure.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Preferred Layout					
Pre-Mitigation	4	2	6	3	36 Moderate
Post-Mitigation	4	2	4	2	20 Low
Alternative Layout					
Pre-Mitigation	4	2	6	2	36 Moderate
Post-Mitigation	4	2	4	2	20 Low

Is the Impact Reversible?	• The impact of flooding on infrastructure is not easily reversible, due to the damage caused. Erosion gullies however, can be remediated.
Mitigation Measures:	• Remove and rehabilitate informal dams. • Construct berms/channels as per SWMP to limit run-on to the PV area, as well as allow for the effective routing of water from the site. • Ensure infrastructure is placed well away from concentrated runoff flow paths, where possible. • For flood sensitive infrastructure, an additional offset from the flood-line should be considered, given the potential inaccuracies in the 2m DTM. • For infrastructure proposed within the simulated flood-line areas, buffers or concentrated runoff areas, these should be flood-compatible in nature (e.g. reinforced PV pylons with panels/carriage way located above the flooding) allowing for the free flowing of water beneath them. • Remediate erosion gullies which may form as a result of flooding. • Establish appropriate surface protection though the planting of grass.
Cumulative impacts:	• Potential alteration to the aquatic ecology and natural flow regime for the hydrological environment. • Given the limited footprint of the project the cumulative impact is expected to be low.
Residual impacts:	• Potential alteration to the aquatic ecology and natural flow regime for the hydrological environment.
Climate Change:	• Given the limited footprint of the project the cumulative impact is expected to be low.

Table 36: Impact assessment: Sedimentation and siltation of water courses

Activity:	Construction/establishment, operation and decommissioning of PV facility				
Impact:	The increase in exposure of soils resulting from the clearing of vegetation at the site will result in an increased sediment load in runoff following rainfall events. This sediment load will ultimately enter water courses and settle out (deposit) once flow velocities reduce.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Preferred Layout					
Pre-Mitigation	3	2	4	4	36 Moderate
Post-Mitigation	3	1	4	3	24 Low
Alternative Layout					
Pre-Mitigation	3	2	4	4	36 Moderate
Post-Mitigation	3	1	4	3	24 Low
Is the Impact Reversible?	• The impact is not easily reversible. In stream sediment (suspended or deposited) cannot easily be retrieved from the receiving water resources.				

Mitigation Measures:	• Construction of containment berms to act as silt traps/settling facilities during construction phase. • Construct berms/channels as per SWMP to limit run-on to the PV area and associated development infrastructure, as well as allow for the effective routing of water from the site. • Ensure infrastructure is placed well away from concentrated runoff flow paths, where possible. • Rehabilitate any erosion gullies. • Ensure grass is replanted on exposed soils.
Cumulative impacts:	• Potential alteration to the aquatic ecology and natural flow regime for the hydrological environment. • Given the limited footprint of the project the cumulative impact is expected to be low.
Residual impacts:	• Residual impacts are associated with an increase sediment load and associated deposition in the receiving water resources such as the Withokspruit.
Climate Change:	• As the expected life of operation of the PV facility increases, the influence of climate change increases. For example, if rainfall intensities increase over time as a result of climate change, so too will the erosivity of the rainfall and associated sediment load routing to receiving water resources. The longer the solar panels are in place, the more chance there is of the effects of climate change being felt.

Table 37: Impact assessment: Alteration of natural drainage patterns

Activity:	Construction/establishment, operation and decommissioning of PV facility				
Impact:	The alterations to the existing or 'natural' flow regime of the site will be affected by the establishment of the PV array and associated development infrastructure. This will be done via and improved rehabilitation in certain areas of the site (compared to previous tailing rehabilitation) as well as the development of the SWMP aimed at ensuring flood water is appropriately managed to both protect infrastructure as well as ensure effective drainage of the site. Existing areas associated with the ponding of water as well as the existing informal dams are proposed to be rehabilitated and as such, will alter the existing drainage pattern.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Preferred Layout					
Pre-Mitigation	4	2	6	4	48 Moderate
Post-Mitigation	4	2	6	4	48 Moderate
Alternative Layout					
Pre-Mitigation	4	2	6	4	48 Moderate
Post-Mitigation	4	2	6	4	48 Moderate
Is the Impact Reversible?	• The impact is not easily reversible. It is important to consider that the current or existing state of the site is not 'natural' due to previous tailing storage at the site.				

Mitigation Measures:	• Plan the site to ensure the impact on the natural drainage is limited, with the understanding that the natural environment was the state of the site prior to the establishment of the reworked tailings facility. • Ensure any proposed infrastructure (eg stream crossings) are designed and established in a manner to maintain the natural flow regime as far as possible. •
Cumulative impacts:	• Potential alteration to the aquatic ecology and natural flow regime for the hydrological environment. • Given the limited footprint of the project the cumulative impact is expected to be low.
Residual impacts:	• Residual impacts are associated with changes to the natural and existing hydrological regime.
Climate Change:	• As the expected life of operation of the PV facility increases, the influence of climate change increases. For example, if rainfall intensities increase over time as a result of climate change, so too will the effect of these intensities on the hydrological flow regime.

Wetland Impact Assessment and Aquatic Impact Assessment

The project will involve the clearing of portions of the site for the establishment of the 40MW power PV facility. The preferred location of the panels and associated infrastructure in relation to the wetlands is provided in Figure 71.

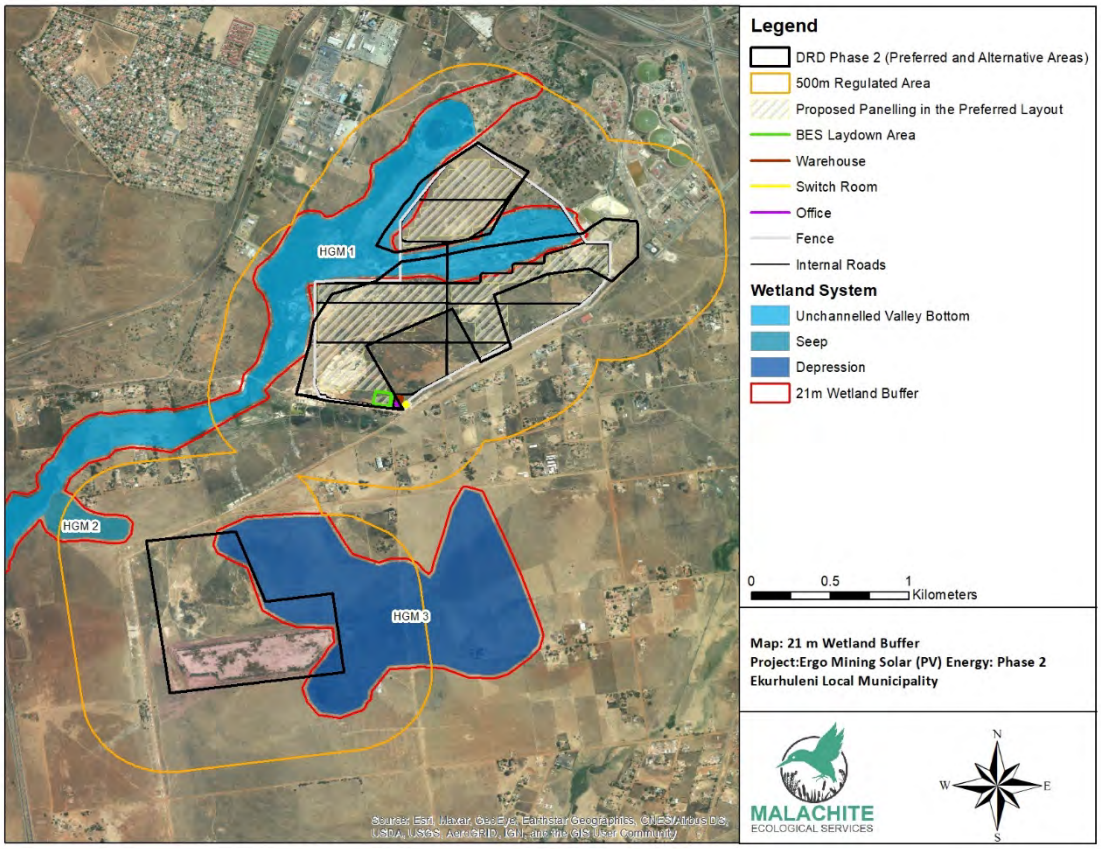


Figure 71: 21m wetland buffer recommendations for the natural wetlands delineated within the study site

Both layout alternatives (preferred and alternative) have been considered in the impact assessment. The preferred layout will have an impact on HGM 1, while the alternative layout will have an impact on HGM 1 and HGM 3. The proposed positioning of the panels in both the preferred and alternative layouts will encroach into small portions of the 21 m buffer. Further to this the outfall from the storm water drainage channels is located within HGM 1. Furthermore, a bridge is proposed to cross HGM 1 in order to gain access to both portions (Ptn 272 and Ptn 183 of the Farm Witpoortje No. 117R) of the preferred layout site (Figure 72).

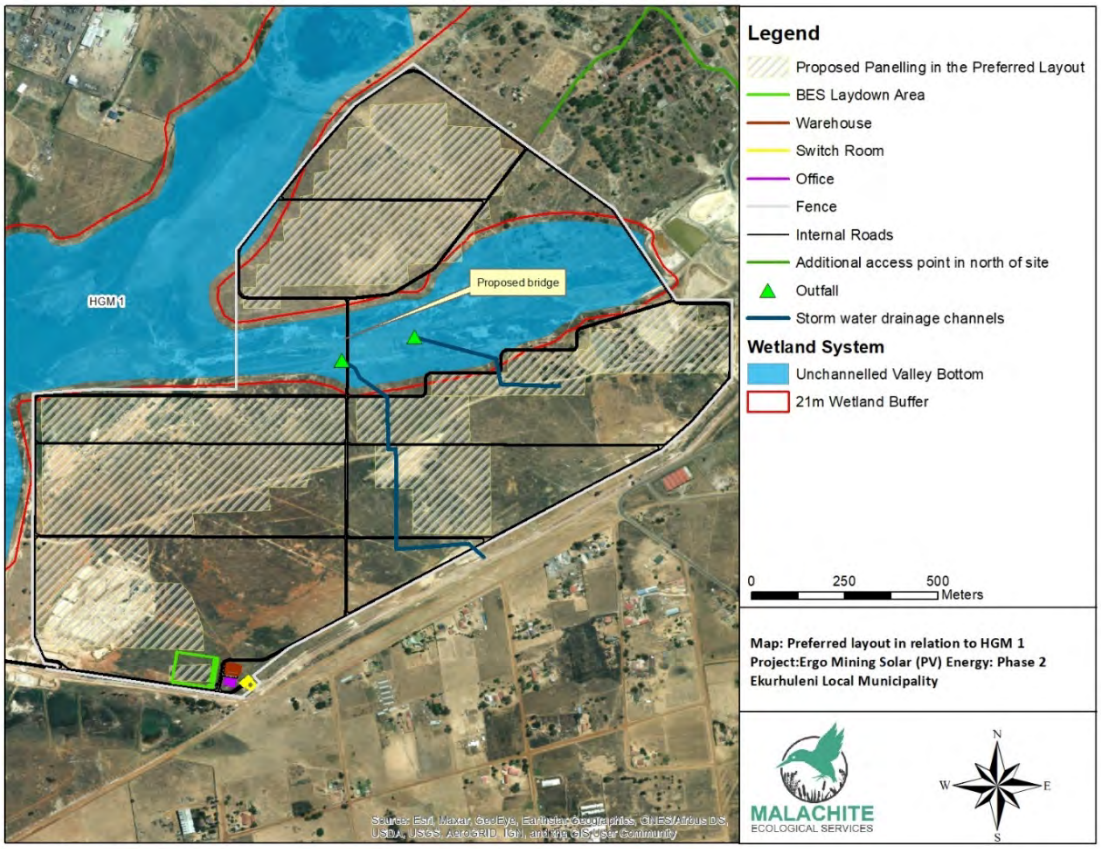


Figure 72: Depiction of all infrastructure in relation to HGM 1

Potential impacts on the receiving natural environment have been identified. Such impacts are likely to include the following:

- Direct impacts: Impacts directly associated with the project. These impacts can be temporary or remain as residual impacts, i.e., the clearing of natural vegetation within PV facility site footprint.
- Indirect impacts: Impacts that are not a direct result of the project and often extend beyond the project boundary, i.e., encroachment of invasive alien vegetation outside of the project area.
- Residual impacts: Impacts that remain following the implementation of mitigation measures, and that may remain after the project has been completed.

- Cumulative impacts: Impacts occurring from the project combined with impacts from past, existing and future projects that will affect the same natural resources e.g. a number of impacts occurring in the same ecosystem.

The activities identified within the study site for both the preferred and alternative layouts include:

- The clearing of portions of the PV facility site for the establishment of the solar panels, and associated infrastructure.
- Installation of the solar panels and associated infrastructure.
- Maintenance of the PV facility during the operational phase.

Negative impacts therefore associated with this project include:

- Soil erosion, sedimentation of the wetland systems.
- Pollution potential.
- Encroachment of invasive alien species into the wetlands as a result of the disturbance.

Several general and specific measures are proposed to mitigate these impacts.

Table 38: Soil erosion and sedimentation of wetland systems (Construction Phase)

Activity:	Soil erosion and sedimentation of wetland systems (Both layout alternatives are considered).
Impact:	Construction activities expose soil to environmental factors including rainfall and wind. The exposure to these factors can result in the formation of erosion gullies and sheet erosion in disturbed areas. This is particularly so, in areas where soil will be compacted by heavy machinery. The eroded soil will quickly be washed downstream into wetland systems. This increased high-suspended particulate matter within the wetlands can accumulate particularly during the wetter months. Sedimentation poses a risk to the geomorphological/functional integrity of wetlands, reducing the ecological integrity of the water resource outside of the impacted area. Given the proposed installation of drainage channels within the site and the outfall of these channels within HGM 1, as well as the encroachment of the buffer in certain sections, the impact of potential erosion is high during the construction phase, if no mitigation measures are implemented. From an aquatic perspective, various impacts have been attributed to sedimentation of aquatic ecosystems, including reduction of light penetration (resulting in reduction in photosynthesis and subsequently, productivity), alteration of foraging dynamics of both carnivores and herbivores, impacting on predator and prey relationships, clogging of gills, rendering the water resource unfit for various aquatic organisms, truncating and shifting the trophic pyramid, absorption of nutrients onto suspended particles, rendering them unavailable and thereby reducing the productivity of the water resource, and filling of interstitial spaces, thereby destroying habitat for macro invertebrates and vertebrates owing to sedimentation, etc. This impact is more of a concern for HGM 3. HGM 3, the depression system, will seasonally hold more water than HGM 1, and this increases the likelihood of the use of this system by aquatic species.

Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Preferred Layout					
Pre-Mitigation	2	2	10	5	70 High
Post-Mitigation	2	2	6	3	30 Moderate
Alternative Layout					
Pre-Mitigation	2	2	10	5	70 High
Post-Mitigation	2	2	6	3	30 Moderate
Is the Impact Reversible?	• This is reversible should the mitigation measures recommended below be implemented. Rehabilitation of any compacted areas, as a result of the construction, but outside of the infrastructural footprint must occur once construction is complete.				
Mitigation Measures:	• No stockpiling of any materials may take place adjacent to any of the natural wetland systems. Erosion control measures must be implemented in areas sensitive to erosion and where erosion has already occurred. These measures include but are not limited to - the use of sandbags, hessian sheets, silt fences, retention or replacement of vegetation and geotextiles such as soil cells which must be used in the protection of slopes. • Topsoil stockpiles must be appropriately protected using for example silt fences or sandbag barriers. • Do not allow surface water or storm water to be concentrated, or to flow down slopes without erosion protection measures being in place. • Make use of existing access roads as much as possible and plan additional access routes if required to avoid wetland systems. • Minimise the extent of the work footprint. • Install sediment barriers across the entire construction right-of-way, to prevent sediment flow, particularly into HGM 1 and HGM 3 (should the alternative layout be approved).				
Cumulative impacts:	• Cumulative impacts are associated with continued development within the larger landscape. This ever-increasing development of the urban environment leads to a decrease in infiltration rates of stormwater and the increased likelihood of erosion gully formation. Given the limited footprint of the project the cumulative impact is expected to be low.				
Residual impacts:	• Residual impacts from the construction phase are associated with the formation of erosion gullies from compacted soils that are not remediated. Over time this will increase in size and will impact areas downstream of the project site				
Climate Change:	• Soil erosion leads to the disturbance and loss of predominantly the topsoil, this is the most productive horizon of a soil profile and the loss of the ecosystem which forms the topsoil has an impact on nutrient and carbon cycles, leading to an impact on climate change in the long-term.				

Table 39: Pollution of wetland systems (Construction Phase)

Activity:	Pollution of wetland systems (Both layout alternatives are considered).

Impact:	Sediment release into a watercourse is one of the most common forms of waterborne pollution. Furthermore, mismanagement of waste and pollutants including hydrocarbons, construction waste and other hazardous chemicals will result in these substances entering and polluting wetland systems either directly through surface runoff during rainfall events, or subsurface water movement				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Preferred Layout					
Pre-Mitigation	2	2	10	5	70 High
Post-Mitigation	2	1	6	3	27 Low
Alternative Layout					
Pre-Mitigation	2	2	10	5	70 High
Post-Mitigation	2	1	6	3	27 Low
Is the Impact Reversible?	• Impacts regarding potential soil pollution as a result of leakage from chemicals can be reversed. Soils that have been contaminated would need to be remediated either on site or removed to a secure location. A spill team would need to be contacted to conduct the remediation exercise.				
Mitigation Measures:	• All waste generated during construction is to be disposed of as per an Environmental Management Programme (EMPr) and washing of containers, wheelbarrows, spades, picks, or any other equipment that has been contaminated with cement or chemicals within any water resources, must be strictly prohibited. • Do not locate chemical storage areas associated with the construction camp or construction site on any of the hydric soils (whether natural or artificially saturated), without ensuring that these chemicals cannot leak or spill into these soil profiles. • Management and disposal of construction waste as per the Environmental Management Programme must occur during the construction of the development. • Waste disposal during the construction phase must ensure no litter or other contaminants particularly chemicals stored on site are deposited into HGM 1 or HGM 3. • No release of any substance i.e. cements or oil that could be toxic to fauna or faunal habitats; Wet cement and/ or concrete must not be allowed to enter any of the wetland systems. •Portable toilets must be placed outside of a 100m buffer from any of the delineated wetlands.				
Cumulative impacts:	• Cumulative impacts relating to the pollution of wetland systems are associated with the continued development of the larger area. As development occurs soils can and are contaminated with chemicals, hydrocarbons, and sediments from a variety of sources such as the existing mine, existing roads and leakage and spillage from construction activities. These soils are not remediated and are therefore changed from their natural state, making it difficult to utilise them in the future. Given the limited footprint of the project area, cumulative impacts of this project are low.				
Residual impacts:	• Residual impacts occur if leakage or spillage of chemicals occur during the construction phase, and these soils are not remediated. These soils will continue to release these chemicals into the environment after construction has ended. Provided the recommendations of this report are adhered to this impact is expected to be low.				

Climate Change:	• Soil pollution leads to a decrease in soil health and changes to the microbial populations of soil ecosystems. This can affect nutrient and carbon cycling leading to an effect on climate change in the long term.

Table 40: Encroachment of alien invasive vegetation (Construction Phase)

Activity:	Encroachment of alien invasive vegetation. (Both layout alternatives are considered).				
Impact:	The clearing of vegetation within portions of the PV Facility site (either the preferred or alternative layout) will lead to the disturbance to the vegetation of these areas. This will lead to the encroachment of alien invasive vegetation species which do occur within the area, if not managed with the implementation of alien invasive management programme. Alien species generally out-compete indigenous species for water, light, space and nutrients as they are adaptable to changing conditions and are able to easily invade a wide range of ecological niches (Bromilow, 2010). Alien invader plant species pose an ecological threat as they alter habitat structure, lower biodiversity (both number and "quality" of species), change nutrient cycling and productivity, and modify food webs (Zedler, 2004).				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Preferred Layout					
Pre-Mitigation	3	2	6	3	33 Moderate
Post-Mitigation	2	1	4	2	14 Low
Alternative Layout					
Pre-Mitigation	3	2	6	3	33 Moderate
Post-Mitigation	2	1	4	2	14 Low
Is the Impact Reversible?	• Impacts regarding the encroachment of alien invasive vegetation within the disturbed portions of the project site can be reversed provided ongoing alien vegetation clearing forms part of the environmental management programme for the construction phase.				
Mitigation Measures:	• Alien invasive species, that were identified within the study area must be removed, prior to construction. By removing these species, the spread of seeds will be prevented into disturbed soils which could have a positive impact on the surrounding natural vegetation. • An alien invasive management programme must be incorporated into an Environmental Management Programme. • Ongoing alien plant control must be undertaken after the construction phase and during the operational phase. Areas which have been disturbed will be quickly colonised by invasive alien species. An ongoing management plan must be implemented for the clearing/eradication of alien species. Recommendations of the botanical specialist assessment must also be adhered to.				
Cumulative impacts:	• Cumulative impacts will only stem from a lack of alien invasive vegetative control. Should alien invasive plants be allowed to continue encroaching the disturbed areas as a result of the construction related activities these will quickly invade areas outside of the project footprint and lead to a decline in the vegetation conditions of the larger area.				

Residual impacts:	• Residual impacts will occur should ongoing alien invasive vegetation monitoring not continue throughout the construction phase of the project and alien vegetation spread outside of the project footprint.
Climate Change:	• Large scale encroachment of alien invasive species leads to changes to the biomass and a loss of indigenous species as well as has negative knock-on effects to the broader soil nutrient cycles affecting gaseous emissions. This has long term impacts on climate change.

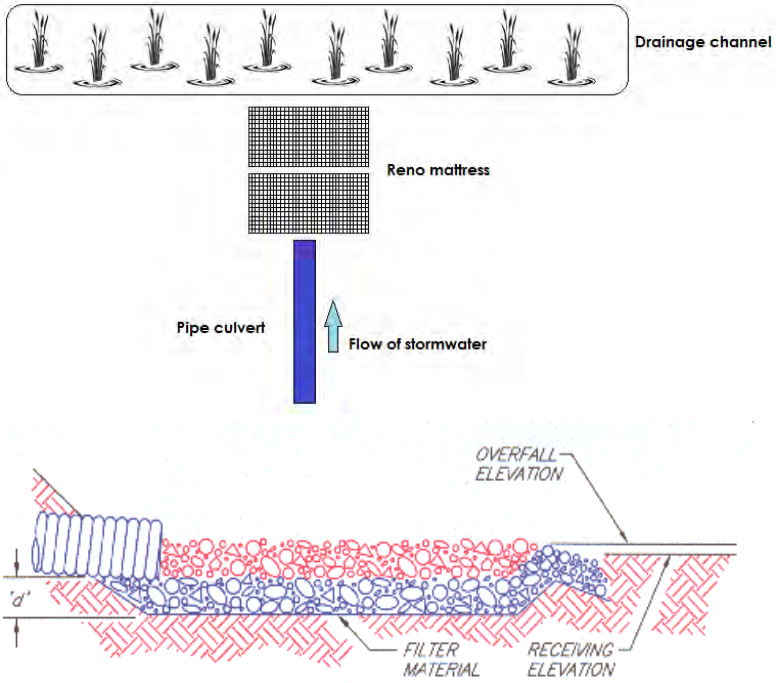
Table 41: Construction of bridge across HGM 1

Activity:	Construction of bridge across HGM 1				
Impact:	The construction of the bridge over HGM 1, will lead to the removal of topsoil within the disturbed footprint. This will subsequently lead to soil erosion within the wetland system if not managed. Sedimentation poses a risk to the geomorphological/functional integrity of wetland systems, reducing the ecological integrity of these systems. Furthermore, the use of any polluting materials such as hydrocarbons, cement, and other hazardous chemicals can lead to the release of these substances entering and polluting the receiving environment either directly through surface runoff during rainfall events, or subsurface water movement. Given the design of the proposed bridge crossing, which will involve the installation of pylons and the laying of the bridge on these pylons, as well as the current degraded state of the HGM unit, the impact is considered low. In the longer term a lack of rehabilitation of any compacted soils as a result of construction activities (i.e., the movement of a LDV vehicles, and the drilling process) will lead to the formation of erosion gullies and the further long-term degradation of the wetland system should these areas not be rehabilitated.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Preferred and Alternative Layouts					
Pre-Mitigation	2	2	8	4	48 Moderate
Post-Mitigation	2	1	6	3	27 Low
Is the Impact Reversible?	• The impacts relating to the construction of the bridge are reversible should the mitigation measures recommended below be implemented. Rehabilitation of any compacted areas, as a result of the construction must occur once construction is complete. Should compaction of soils occur during the operational phase these must be remediated as soon as possible.				
Mitigation Measures:	• Effective rehabilitation of the development footprint as well as the implementation of erosion control measures is imperative to mitigate risks to the wetland system. • Use vehicular digging within the wetland system, only if deemed absolutely necessary and stick to one access road. Do not drive all over the wetland system. • Working during the winter months will reduce soil erosion potential in disturbed areas. • There shall be no mining of soil/sand required for construction purposes from the wetland system. Soil must be brought in, if needed for construction purposes. This must also be stockpiled				

	away from the wetland's edge. • No stockpiling of any materials may take place adjacent to the wetland. • Vegetation clearing must only be undertaken when construction activity is actually underway at the bridge point and this area of the wetland must be rehabilitated as soon as construction activities have ended utilising indigenous grasses. • Install sediment barriers across the entire construction right-of-way immediately upslope and downslope of the bridge to prevent sediment flow into the wetland. • Rehabilitation must be aimed at improving the status and function of the ecosystem, through the removal of invasive alien species and the planting of indigenous species. • No release of hazardous substances i.e., cement, oil, that could be toxic to within the wetland system. • Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using correct solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil must be removed, and the affected area rehabilitated immediately – consult with a wetland/ecological specialist if spills occur.
Cumulative impacts:	• Cumulative impacts are associated with continued development within the larger landscape. This ever-increasing development of the urban environment leads to an increase in soil compaction, a decrease in stormwater management, and therefore an increase in the likelihood for erosion gully formation. Mitigation measures recommended in this report will decrease the cumulative impacts of this project on the larger landscape.
Residual impacts:	• Residual impacts are associated with the formation of erosion gullies from compacted soils that are not remediated. Over time this will increase in size and will impact areas downstream of the project site.
Climate Change:	• Soil erosion leads to the disturbance and loss of predominantly the topsoil, this is the most productive horizon of a soil profile and the loss of the ecosystem which forms the topsoil has an impact on nutrient and carbon cycles, leading to an impact on climate change in the long-term.

Table 42: Construction of drainage channels for the stormwater management of the area

Activity:	Construction of drainage channels for the stormwater management of the area				
Impact:	Internal drains are proposed to be installed within the PV Facility site to drain excess storm water which ponds on the Stilfontein soils. These drains are proposed to have an outfall within HGM 1 (Figure 31). Impacts associated with this proposed storm water management infrastructure relate mainly to the potential for the formation of erosion gullies both along the channels as well as at the outfall site. The storm water management plan however includes this potential risk in the design of the channels as described in the mitigation measures section below				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Preferred Layout					
Pre-Mitigation	2	2	4	4	32 Moderate
Post-Mitigation	2	1	2	2	10 Low

Is the Impact Reversible?	• This is reversible should the mitigation measures recommended below be implemented. Rehabilitation of any compacted areas, as a result of the construction must occur once construction is complete.
Mitigation Measures:	• The design concept as provided in the storm water management plan must be adhered to. This includes the use of grassed trapezoidal channels, which is similar to that of a grassed swale. The design follows the principals of a sustainable drainage system (SuDS). The principles behind the use of SuDS encourage flood waters to infiltrate to groundwater as quickly as possible in the immediate area rather than channelling it away. Consideration is given to water quality as well as the amenity and biodiversity values of water, thereby improving the hydrological flow entering the receiving environment. • Once construction of the channels is completed the disturbed footprint including any compacted areas, must be rehabilitated as well as planted with indigenous grass species. • At the outfall sites of the channels, it is recommended that soil erosion measures are implemented. These include but are not limited to sand bags, hessian sheets, silt fences, retention or replacement of vegetation and geotextiles such as soil cells which can be used in the protection of slopes. • Other erosion protection measures can include using energy dissipaters to slow the velocity of water coming from the channels as shown below: 
Cumulative impacts:	• Cumulative impacts are associated with continued development within the larger landscape. This ever-increasing development of the urban environment leads to an increase in soil compaction, a decrease in stormwater management, and therefore an increase in the likelihood for erosion gully formation. Mitigation measures recommended in this report will decrease the cumulative impacts of this project on the larger landscape.
Residual impacts:	• Residual impacts are associated with the formation of erosion gullies both from compacted soils that are not remediated as well as from the lack of implementation of erosion control measures, particularly at the outfall location of the drains. Over time erosion gullies will increase in size and will impact areas downstream of the project site.

Climate Change:	• Soil erosion leads to the disturbance and loss of predominantly the top soil, this is the most productive horizon of a soil profile and the loss of the ecosystem which forms the topsoil has an impact on nutrient and carbon cycles, leading to an impact on climate change in the long-term.

Table 43: Soil erosion and sedimentation of wetland systems (Operational Phase)

Activity:	Soil erosion and sedimentation of wetland systems. (Both layout alternatives are considered).				
Impact:	In the longer term a lack of rehabilitation of any compacted soils within or adjacent to wetland systems will lead to the formation of erosion gullies and the long-term degradation of wetland systems.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Preferred Layout					
Pre-Mitigation	5	2	4	3	33 Moderate
Post-Mitigation	5	1	2	2	16 Low
Alternative Layout					
Pre-Mitigation	5	2	4	3	33 Moderate
Post-Mitigation	5	1	2	2	16 Low
Is the Impact Reversible?	• This is reversible should the mitigation measures recommended below be implemented. Rehabilitation of any compacted areas, as a result of the construction must occur once construction is complete. Should compaction of soils occur during the operational phase these must be remediated as soon as possible.				
Mitigation Measures:	• All vehicles must not deviate from designated access roads. Driving within wetland systems during the operational phase must be prohibited. • Follow up and monitoring of rehabilitation measures. • Implementation of additional rehabilitation measures if certain rehabilitation techniques are not successful.				
Cumulative impacts:	• Cumulative impacts are associated with continued development within the larger landscape. This ever-increasing development of the urban environment leads to an increase in soil compaction, a decrease in stormwater management, and therefore an increase in the likelihood for erosion gully formation. Mitigation measures recommended in this report will decrease the cumulative impacts of this project on the larger landscape.				
Residual impacts:	• Residual impacts are associated with the formation of erosion gullies from compacted soils that are not remediated. Over time this will increase in size and will impact areas downstream of the project site.				
Climate Change:	• Soil erosion leads to the disturbance and loss of predominantly the top soil, this is the most productive horizon of a soil profile and the loss of the ecosystem which forms the topsoil has an impact on nutrient and carbon cycles, leading to an impact on climate change in the long-term.				

Table 44: Pollution of wetland systems (Operational Phase)

Activity:	Pollution of wetland systems. (Both layout alternatives are considered)				
Impact:	During the operational phase, any maintenance of the PV facility can lead to the release of substances into the soil profile, polluting the wetland systems.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Preferred Layout					
Pre-Mitigation	5	2	4	3	33 Moderate
Post-Mitigation	5	1	2	2	16 Low
Alternative Layout					
Pre-Mitigation	5	2	4	3	33 Moderate
Post-Mitigation	5	1	2	2	16 Low
Is the Impact Reversible?	• Impacts regarding potential soil and wetland pollution as a result of leakage from chemicals can be reversed. Soils that have been contaminated would need to be remediated either on site or removed to a secure location. A spill team would need to be contacted to conduct the remediation exercise for both the soils and wetland systems impacted.				
Mitigation Measures:	• All waste generated during construction is to be disposed of as per the EMPr. • Waste disposal during the operational phase must ensure no litter or other chemicals used for maintenance activities are deposited into any of the natural wetland systems. • No release of any substance i.e., cements, oil, or any other substance that could be toxic into the soil profiles. Check vehicles and equipment entering the site for oil and fuel leaks and inspect site for possible spillages. • Spillages of fuels, oils and other potentially harmful chemicals must be contained and cleaned up immediately. Contaminants must be properly drained and disposed of using proper solid/hazardous waste facilities (never to be disposed of within the natural environment). Any contaminated soil must be removed, and the affected area rehabilitated immediately.				
Cumulative impacts:	• Cumulative impacts relating to wetland pollution are associated with the continued development of the larger area. As development occurs wetland systems can and are contaminated with chemicals, hydrocarbons, and sediments from a variety of sources such as the existing mine, existing roads and leakage and spillage from maintenance activities. These impacts cause a decline in the health, functional integrity and ecological importance and sensitivity of the affected wetland systems.				
Residual impacts:	• Residual impacts occur if leakage or spillage of chemicals occur during maintenance activities and these chemicals make their way into adjacent or downstream wetlands. If affected soils are not remediated, they will continue to release these chemicals into the environment, and these could enter into the wetland systems. This leads to a decline in wetland health, functional integrity, and ecological sensitivity of these systems. Provided the recommendations of this report are adhered to this impact is expected to be low.				
Climate Change:	• Soil pollution leads to a decrease in soil health and changes to the microbial populations of soil ecosystems. This can affect nutrient and carbon cycling leading to an effect on climate change in the long term.				

Table 45: Encroachment of alien invasive vegetation (Operational Phase)

Activity:	Encroachment of alien invasive vegetation (Both layout alternatives are considered)				
Impact:	Disturbances as a result of maintenance activities as well as a lack of rehabilitation after the completion of construction, will lead to the encroachment of alien invasive vegetation species which do occur within the area, if not managed with the implementation of alien invasive management programme.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Preferred Layout					
Pre-Mitigation	5	2	6	4	52 Moderate
Post-Mitigation	3	1	4	2	16 Low
Alternative Layout					
Pre-Mitigation	5	2	6	4	52 Moderate
Post-Mitigation	3	1	4	2	16 Low
Is the Impact Reversible?	• Encroachment of alien invasive species is reversible provided ongoing alien plant control is undertaken as per the mitigation measure provided below.				
Mitigation Measures:	• An alien invasive management programme must be incorporated into an Environmental Management Programme. • Ongoing alien plant control must be undertaken after the construction phase and during the operational phase. Areas which have been disturbed will be quickly colonised by invasive alien species. An ongoing management plan must be implemented for the clearing/eradication of alien species. Recommendations of the botanical specialist assessment must also be adhered to.				
Cumulative impacts:	• Cumulative impacts will only stem from a lack of alien invasive vegetative control. Should alien invasive plants be allowed to continue encroaching the disturbed areas during the operational phase these will quickly invade areas outside of the project footprint and lead to a decline in the vegetation conditions of the larger area.				
Residual impacts:	• Residual impacts will occur should ongoing alien invasive vegetation monitoring not continue throughout the operational phase of the project and alien vegetation spread outside of the project footprint.				
Climate Change:	• Large scale encroachment of alien invasive species leads to changes to the biomass and a loss of indigenous species as well as has negative knock-on effects to the broader soil nutrient cycles affecting gaseous emissions. This has long term impacts on climate change.				

Table 46: Existence of bridge across HGM 1

Activity:	Existence of bridge across HGM 1
Impact:	In the longer-term, sediment movement as a result of inadequately designed roads and bridges can lead to excessive erosion within and adjacent to the structures. This affects the wetland system geomorphic setting and flow dynamics both at the site of the erosion as well as downstream. This has

	knock-on effects on the use of the wetland systems as ecological corridors in the larger urban landscape. In addition to this, hardened surfaces are recognised as a source of various pollutants which can originate from a wide variety of sources. The pollutant concentration in road runoff can be highly variable and dependent on a wide variety of factors including location, traffic volumes, extent of dry period before a rainfall event, and nature of the surface. The increase in hardened surfaces as a result of the project will lead to the increase in the flushing of these pollutants into the HGM unit during the operational phase of this development. Given the limited access to the PV facility, this impact is expected to be low.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Preferred and Alternative Layouts					
Pre-Mitigation	5	2	4	3	33 Moderate
Post-Mitigation	5	1	2	2	16 Low
Is the Impact Reversible?	• This is reversible should the mitigation measures recommended below be implemented. Rehabilitation of any compacted areas once construction has been completed must occur and the area planted with indigenous grasses. Should compaction of soils occur during the operational phase these must be remediated as soon as possible.				
Mitigation Measures:	• All vehicles must not deviate from designated access roads. Driving within wetland systems during the operational phase must be prohibited. • Follow up and monitoring of rehabilitation measures. • Implementation of additional rehabilitation measures if certain rehabilitation techniques are not successful. •				
Cumulative impacts:	• Cumulative impacts are associated with continued development within the larger landscape. This ever-increasing development of the urban environment leads to an increase in soil compaction, a decrease in stormwater management, and therefore an increase in the likelihood for erosion gully formation. Mitigation measures recommended in this report will decrease the cumulative impacts of this project on the larger landscape.				
Residual impacts:	• Residual impacts are associated with the formation of erosion gullies from compacted soils that are not remediated. Over time this will increase in size and will impact areas downstream of the project site.				
Climate Change:	• Soil erosion leads to the disturbance and loss of predominantly the top soil, this is the most productive horizon of a soil profile and the loss of the ecosystem which forms the topsoil has an impact on nutrient and carbon cycles, leading to an impact on climate change in the long-term.				

Table 47: Operation of drainage channels for the stormwater management of the area

Activity:	Operation of drainage channels for the stormwater management of the area
Impact:	In the longer term a lack of maintenance of erosion control measures as well as maintenance of the grassed lined channels can lead to a failure of these channels, which will ultimately lead to the formation of erosion gullies and the long-term degradation of the already impacted wetland system.

Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Preferred Layout					
Pre-Mitigation	5	2	4	3	33 Moderate
Post-Mitigation	5	1	2	2	16 Low
Is the Impact Reversible?	• This is reversible should the mitigation measures recommended below be implemented.				
Mitigation Measures:	• All drains must be inspected and maintained. This ensures efficient operation and prevents failure. Usually, SuDS components are on or near the surface and most can be managed using landscape maintenance techniques. • Corrective maintenance to repair defects or improve performance of the drains must be implemented when necessary. • Maintenance must address silt control, vegetation maintenance, inspection of the outfall areas, removal of litter, removal of alien invasive species. •				
Cumulative impacts:	• Cumulative impacts are associated with continued development within the larger landscape. This ever-increasing development of the urban environment leads to an increase in soil compaction, a decrease in stormwater management, and therefore an increase in the likelihood for erosion gully formation. Mitigation measures recommended in this report will decrease the cumulative impacts of this project on the larger landscape.				
Residual impacts:	• Residual impacts are associated with the formation of erosion gullies from unmaintained drainage channels. Over time these gullies will increase in size and will impact areas downstream of the project site.				
Climate Change:	• Soil erosion leads to the disturbance and loss of predominantly the top soil, this is the most productive horizon of a soil profile and the loss of the ecosystem which forms the topsoil has an impact on nutrient and carbon cycles, leading to an impact on climate change in the long-term.				

Soils, land capability and agricultural potential assessment

Any development activity in a natural system will have an impact on the surrounding environment, usually in a negative way. The purpose of this phase of the study was to identify and assess the significance of the impacts caused by the proposed project on the soils as well as the agricultural potential of the site. Furthermore, mitigation measures are recommended to limit the identified negative impacts on the receiving environment.

The project will involve minimal grass clearing of portions of the site where the solar panels and internal roads will be positioned for the establishment of the 40MW power PV facility. The preferred location of the panels and associated infrastructure in relation to the soils is provided in Figure 73 and Figure 74.

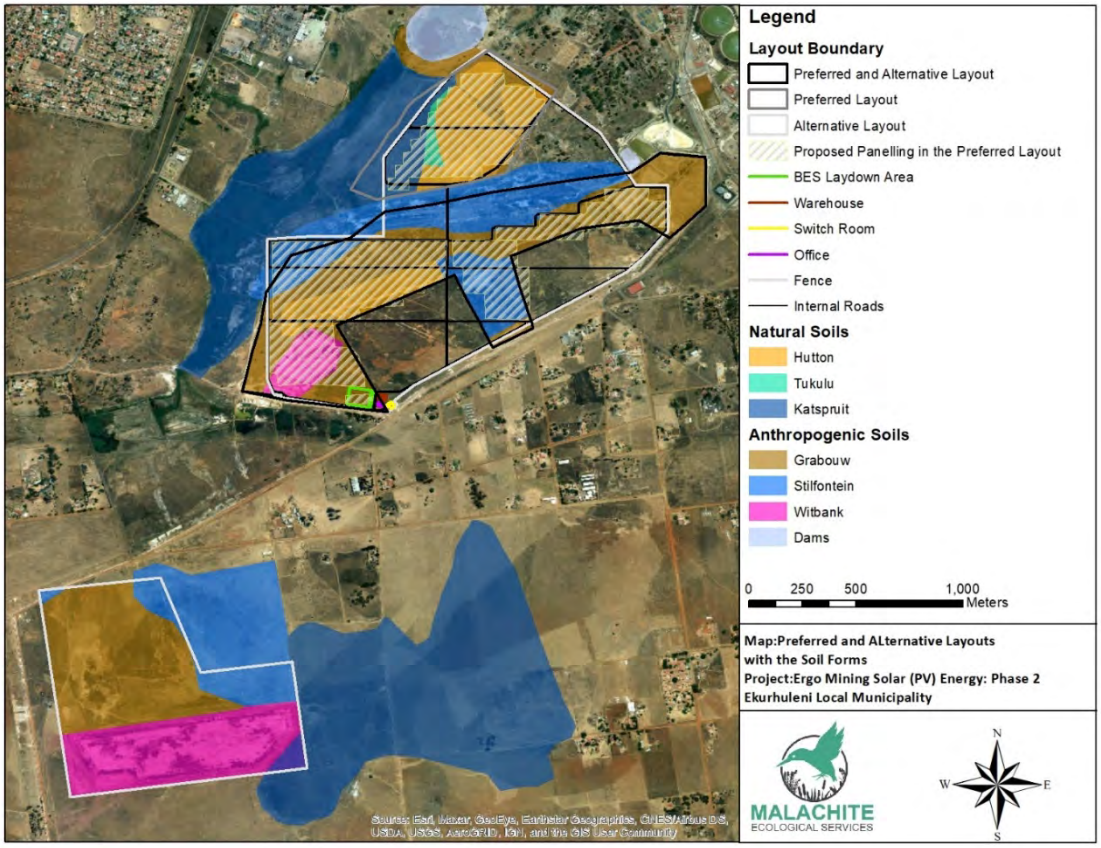


Figure 73: Soil forms of the study site in relation to preferred and alternative layout sites

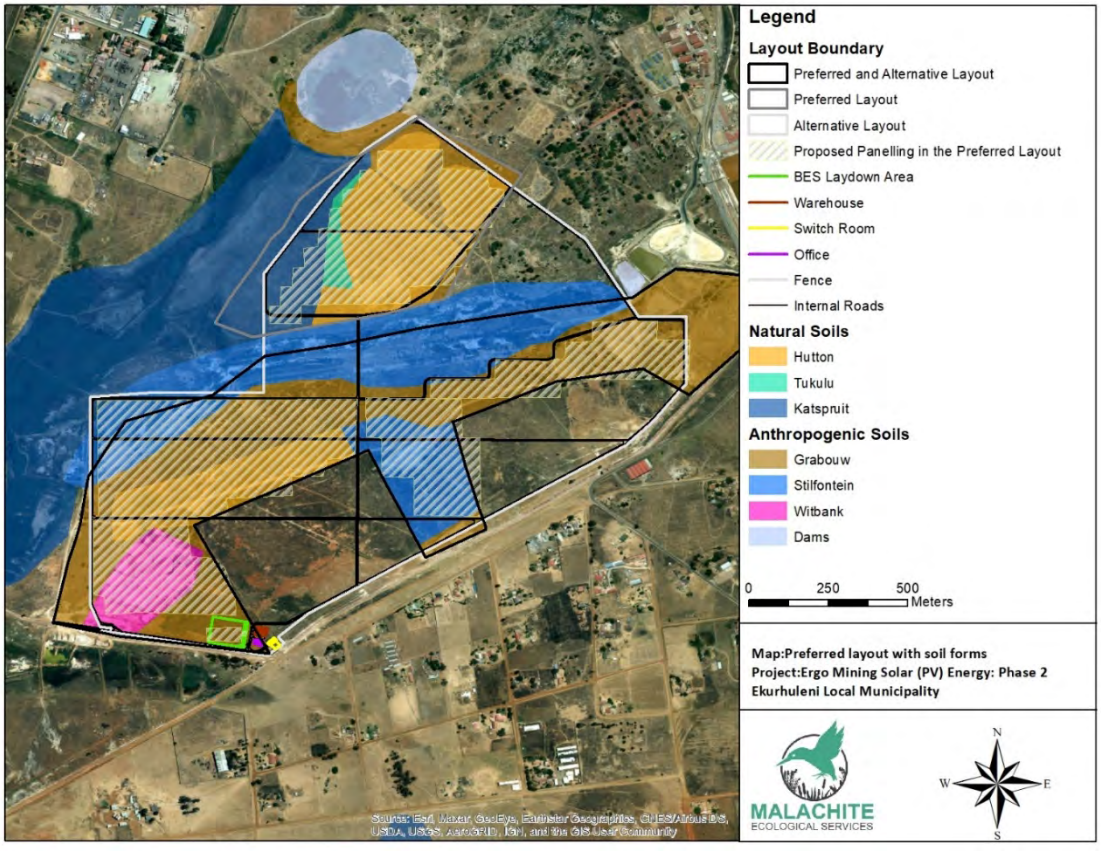


Figure 74: Soil forms of the study site in relation to preferred layout site

The alternative layout is similar to the preferred layout, with Portion 183 of the Farm Witpoortje No. 117R forming part of both the preferred and alternative layouts. Similar soils were identified in the Remainder of Portion 9 of the Farm Withok No. 131IR as in the preferred layout site. As such impacts to the agricultural potential of the study site were identified as being the same for both layouts (preferred and alternative) and are associated with (i) the loss of agricultural land; (ii) soil compaction and exposure of topsoil leading to erosion and (iii) pollution of the soils as a result of construction related activities. Several general and specific measures are proposed to mitigate these impacts.

Table 48: Loss of agricultural productive land within the study area: Construction Phase

Activity:	Loss of agricultural productive land within the study area during construction phases (Both layout alternatives are considered).				
Impact:	Loss of agricultural land was assessed with regards to the loss of arable land within the site and within adjacent properties. The identified agricultural limitations within the study site as a result of the significant anthropogenic modifications to the soils as well as the saturation of the soil reduces the likelihood of the use of this area for the cultivation of crops. The preferred layout site has only 22% of soils that are agriculturally viable for crop cultivation, while the alternative layout has only 5.7% of these soils. These soils (Hutton/Nkonkoni soils) are scattered within the preferred and alternative layout site and are located adjacent to non-agricultural soils as a result of anthropogenic impacts to the site. The southern portion (Ptn 9/131) of the alternative layout has no agriculturally viable soils. Given the limited area of agriculturally viable soils in both layout alternatives, the loss of agriculturally productive land is low/not applicable and mitigation measures are aimed at limiting impacts to any adjacent properties. The site could however be utilised for grazing; with pasture grasses the current scenario on site. Given that the study site is owned by Ergo Mining and the area utilised for mining operation mitigation measures are aimed at limiting impacts to any adjacent properties.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-Mitigation	1	1	1	1	4 Low
Post-Mitigation	1	1	1	1	4 Low
Is the Impact Reversible?	• There is no loss of agricultural land as a result of this project. The land is owned by Ergo Mining and the area utilised for mining operations. As such the impact is considered not applicable.				
Mitigation Measures:	• During construction, workers must remain within the site and must not affect adjacent properties. • Dust monitoring during construction must form part of the Environmental Management Programme as dust will affect vegetation growth. • Management of waste so that it does not impact adjacent properties must take place as per the Environmental Management Programme (EMPr) particularly during the operational phase. • The implementation of an alien invasive control plan must form part of the EMPr. Alien species will quickly establish on disturbed soils, potentially spread to adjacent properties. Their growth must be monitored, and alien control implemented when necessary.				

Cumulative impacts:	• Portions of the preferred and alternative layout (particularly Ptn 183/117) are currently used for grazing. Given the low agricultural potential of the site this is the only agricultural activity that will be lost as a result of the area. Areas surrounding the project site will however still offer grazing land, thus limiting the cumulative impact of the loss of agricultural land in the area.
Residual impacts:	• Not applicable as the only agricultural activity which occurs within the project area, grazing, can still continue in adjacent areas during the construction and operational phases of the project.
Climate Change:	• Not applicable.

Table 49: Soil Compaction leading to erosion and sedimentation (Construction Phase)

Activity:	Soil Compaction leading to erosion and sedimentation. (Both layout alternatives are considered)				
Impact:	The clearing of vegetation for the establishment of the PV facility including all infrastructure (internal roads, fencing, warehouse, office, BES lay down area and the panels) will result in the exposure of the topsoil to environmental factors including rainfall and wind. Furthermore, the use of heavy machinery or vehicles during construction, will lead to the compaction of these disturbed soils. This will increase the soil bulk density, reduce the porosity further and the hydraulic conductivity, leading to a greater potential for the formation of erosion gullies. This is particularly so for construction related activities on the Stilfontein soils, which are saturated, and are thus more susceptible to erosion. In the long-term, the existence of the PV facility can lead to the formation of erosion gullies, particularly if there is inadequate stormwater control within this site. Given the disturbed nature of the soils in this area this impact is expected to be low.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-Mitigation	2	2	6	3	30 Moderate
Post-Mitigation	1	1	4	2	12 Low
Is the Impact Reversible?	• This impact is reversible should the mitigation measures recommended below be implemented. Rehabilitation of compacted areas, outside of the footprint of the PV facility must occur once construction is complete.				
Mitigation Measures:	• Erosion control measures must be implemented in areas sensitive to erosion such as near water supply points, edges of slopes, etc. These measures include but are not limited to - sand bags, hessian sheets, silt fences, retention or replacement of vegetation and geotextiles such as soil cells which must be used in the protection of slopes. • Do not allow surface water or stormwater to be concentrated, or to flow down any cut or fill slopes without erosion protection measures being in place. • Vegetation clearing must be undertaken only in the areas to be affected and must not extend outside of the PV facility footprint.				

	• Demarcate all/any sensitive ecological areas (i.e. wetlands) within the site and ensure that these areas remain off-limits during construction.
Cumulative impacts:	• Cumulative impacts are associated with continued development within the larger landscape. This ever-increasing development of the urban environment leads to a decrease in infiltration rates of stormwater and the increased likelihood of erosion gully formation. Given the limited footprint of the project the cumulative impact is expected to be low.
Residual impacts:	• Residual impacts from the construction phase are associated with the formation of erosion gullies from compacted soils that are not remediated. Over time this will increase in size and will impact areas downstream of the project site.
Climate Change:	• Soil erosion leads to the disturbance and loss of predominantly the topsoil, which is the most productive horizon of a soil profile and the loss of the ecosystem which forms the topsoil has an impact on nutrient and carbon cycles, leading to an impact on climate change in the long-term.

Table 50: Soil Pollution (Construction Phase)

Activity:	Soil Pollution (Both layout alternatives are considered)				
Impact:	Sediment releases (particularly contaminated sediments) from a construction site into the downstream aquatic environment is one of the most common forms of waterborne pollution. Furthermore, mismanagement of waste and pollutants including hydrocarbons, construction waste and other hazardous chemicals will result in these substances entering and polluting the soil profile. These pollutants can quickly be transferred to nearby water resources situated within the vicinity of PV facility site in both the preferred and alternative layouts.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-Mitigation	2	2	6	3	30 Moderate
Post-Mitigation	1	1	4	2	12 Low
Is the Impact Reversible?	• Impacts regarding potential soil pollution as a result of leakage from chemicals can be reversed. Soils that have been contaminated would need to be remediated either on site or removed to a secure location. A spill team would need to be contacted to conduct the remediation exercise.				
Mitigation Measures:	• All waste generated during construction is to be disposed of as per the EMPr. • Management and disposal of construction waste as per the Environmental Management Plan must occur during the construction of the development. • Waste disposal during the construction phase must ensure no litter or other contaminants particularly chemicals stored on site are deposited into the unchannelled valley bottom system (located in close proximity to both layout sites) as well as the depression system (located in close proximity to the alternative layout site). • Do not locate chemical storage areas associated with the construction camp or construction site on any of the hydric soils (whether natural or artificially saturated), without ensuring that these chemicals cannot leak or spill into these soil profiles. • No release of any substance i.e., cements, oil, or any other substance that could be toxic into the soil profiles. Check vehicles and equipment entering the site for oil and fuel leaks and inspect				

	site for possible spillages. • Spillages of fuels, oils and other potentially harmful chemicals must be contained and cleaned up immediately. Contaminants must be properly drained and disposed of using proper solid/hazardous waste facilities (never to be disposed of within the natural environment). Any contaminated soil must be removed, and the affected area rehabilitated immediately.
Cumulative impacts:	• Cumulative impacts relating to soil pollution are associated with the continued development of the larger area. As development occurs soils can and are contaminated with chemicals, hydrocarbons, and sediments from a variety of sources such as the existing mine, existing roads and leakage and spillage from construction activities. These soils are not remediated and are therefore changed from their natural state, making it difficult to utilise them in the future. Given the low agricultural potential of the site as well as the limited footprint of the project area, cumulative impacts of this project are low.
Residual impacts:	• Residual impacts occur if leakage or spillage of chemicals occur during the construction phase, and these soils are not remediated. These soils will continue to release these chemicals into the environment after construction has ended. Provided the recommendations of this report are adhered to this impact is expected to be low.
Climate Change:	• Soil pollution leads to a decrease in soil health and changes to the microbial populations of soil ecosystems. This can affect nutrient and carbon cycling leading to an effect on climate change in the long term.

Table 51: Soil Compaction leading to erosion and sedimentation (Operational Phase)

Activity:	Soil Compaction leading to erosion and sedimentation. (Both layout alternatives are considered)				
Impact:	In the long-term, the existence of the PV facility can lead to the formation of erosion gullies, particularly if there is inadequate stormwater control within this site. Given the disturbed nature of the soils in this area this impact is expected to be low.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-Mitigation	5	2	4	3	33 Moderate
Post-Mitigation	5	1	2	2	16 Low
Is the Impact Reversible?	• This is reversible should the mitigation measures recommended below be implemented. Rehabilitation of compacted areas, outside of the footprint of the PV facility must occur once construction is complete, and the project enters the operational phase. Should compaction of soils occur during the operational phase these must be remediated as soon as possible.				
Mitigation Measures:	• It is recommended that areas that are not in use be planted with an indigenous grass cover to limit the exposure time of soils. • Outflow points of the drainage channels created as part of the stormwater management of the site must be protected by erosion control measures as described below. • Erosion control measures must be implemented in areas sensitive to erosion such as near water supply points, edges of slopes, etc. These measures include but are not limited to - sand bags, hessian sheets, silt fences, retention or replacement of vegetation and geotextiles such as soil cells which must be used in the protection of slopes.				

Cumulative impacts:	• Cumulative impacts are associated with continued development within the larger landscape. This ever-increasing development of the urban environment leads to an increase in soil compaction, a decrease in stormwater management, and therefore an increase in the likelihood for erosion gully formation. Mitigation measures recommended in this report will decrease the cumulative impacts of this project on the larger landscape.
Residual impacts:	• Residual impacts are associated with the formation of erosion gullies from compacted soils that are not remediated. Over time this will increase in size and will impact areas downstream of the project site.
Climate Change:	• Soil erosion leads to the disturbance and loss of predominantly the top soil, which is the most productive horizon of a soil profile and the loss of the ecosystem which forms the topsoil has an impact on nutrient and carbon cycles, leading to an impact on climate change in the long-term.

Table 52: Soil Pollution (Operational Phase)

Activity:	Soil Pollution (Both layout alternatives are considered).				
Impact:	During the operational phase, any maintenance of the PV facility can lead to the release of substances into the soil profile, polluting the area. Internal roads may be contaminated with pollutants such as petroleum residues, oil, metals from brake linings, rubber particles from tires, nitrous oxide from car exhausts, and grease. The internal roads are however proposed to be utilised by only pedestrians, cycles or golf carts, and/or quad bike type vehicles, and thus this impact is expected to be low.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-Mitigation	5	2	4	3	33 Moderate
Post-Mitigation	5	1	2	2	16 Low
Is the Impact Reversible?	• Impacts regarding potential soil pollution as a result of leakage from chemicals can be reversed. Soils that have been contaminated would need to be remediated either on site or removed to a secure location. A spill team would need to be contacted to conduct the remediation exercise.				
Mitigation Measures:	• Waste disposal during the operational phase must ensure no litter or other chemicals used for maintenance activities are spilled or deposited into the soils. • No release of any substance i.e., cements, oil, or any other substance that could be toxic into the soil profiles. Check vehicles and equipment entering the site for oil and fuel leaks and inspect site for possible spillages. • Spillages of fuels, oils and other potentially harmful chemicals must be contained and cleaned up immediately. Contaminants must be properly drained and disposed of using proper solid/hazardous waste facilities (never to be disposed of within the natural environment). Any contaminated soil must be removed, and the affected area rehabilitated immediately.				
Cumulative impacts:	• Cumulative impacts relating to soil pollution are associated with the continued development of the larger area. As development occurs soils can and are contaminated with chemicals, hydrocarbons, and sediments from a variety of sources such as the existing mine, existing roads and leakage and spillage from maintenance activities. These soils are not remediated and are				

	therefore changed from their natural state, making it difficult to utilise them in the future. Given the low agricultural potential of the site as well as the limited footprint of the project area, cumulative impacts of this project are low.
Residual impacts:	• Residual impacts occur if leakage or spillage of chemicals occur during the operational phase, and these soils are not remediated. These soils will continue to release these chemicals into the environment. Provided the recommendations of this report are adhered to this impact is expected to be low.
Climate Change:	• Soil pollution leads to a decrease in soil health and changes to the microbial populations of soil ecosystems. This can affect nutrient and carbon cycling leading to an effect on climate change in the long term.

Heritage Assessment

Impacts to heritage resources without mitigation within the project footprint will be permanent and negative and occur during the pre-construction and construction activities. Historical and modern artefacts were recorded where the reclaimed slimes dam that covered area A1 (DRD001 to DRD004) occurred. The artefacts are out of context and isolated, but artefacts at DRD003 and DRD004 allude to historical mining and associated occupation of the area and surrounds. These are mostly in a mixed context and of low significance. Better preserved samples have been mitigated and recorded by Pelser (2022) that showed these to be of limited value and most probably being dumped at these locations.

The survey recorded Stone Age artefacts at DRD005 and DRD009. The artefacts are out of context and scattered too sparsely to be of significance apart from mentioning them in this report and can be attributed to background scatter (Orton 2016) of low significance.

The recorded structures and ruins at DRD006, DRD007 and DRD008, potential to contribute to aesthetic, historic, scientific, and social aspects are non-existent, and it is therefore of low heritage significance. Feature DRD006 is located outside of the impact areas and will not be affected by the project. The standing structures at DRD008 are likely older than 60 years and therefore fall under the ambit of the NHRA based on their age and if impacted on mitigation will be required. The ruin at DRD007 has been destroyed to such an extent that nothing of historical value remains. The impacts can be mitigated to an acceptable level (Figure 75).

Any additional effects to subsurface heritage resources can be successfully mitigated by implementing a chance find procedure. Mitigation measures for specific observations as outlined in (Appendix K: Table 9) and additional recommendations in the heritage report should be implemented during all phases of the project. With the implementation of the recommended mitigation measures impacts of the project on heritage resources is acceptable (Appendix K: Table 8).

Cumulative impacts occur from the combination of effects of various impacts on heritage resources. The importance of identifying and assessing cumulative impacts is that the whole is greater than the sum of its parts. In the case of this project, impacts can be mitigated to an acceptable level. However, this and other projects in the area can have a negative impact on heritage sites in the area where these sites have been destroyed unknowingly.

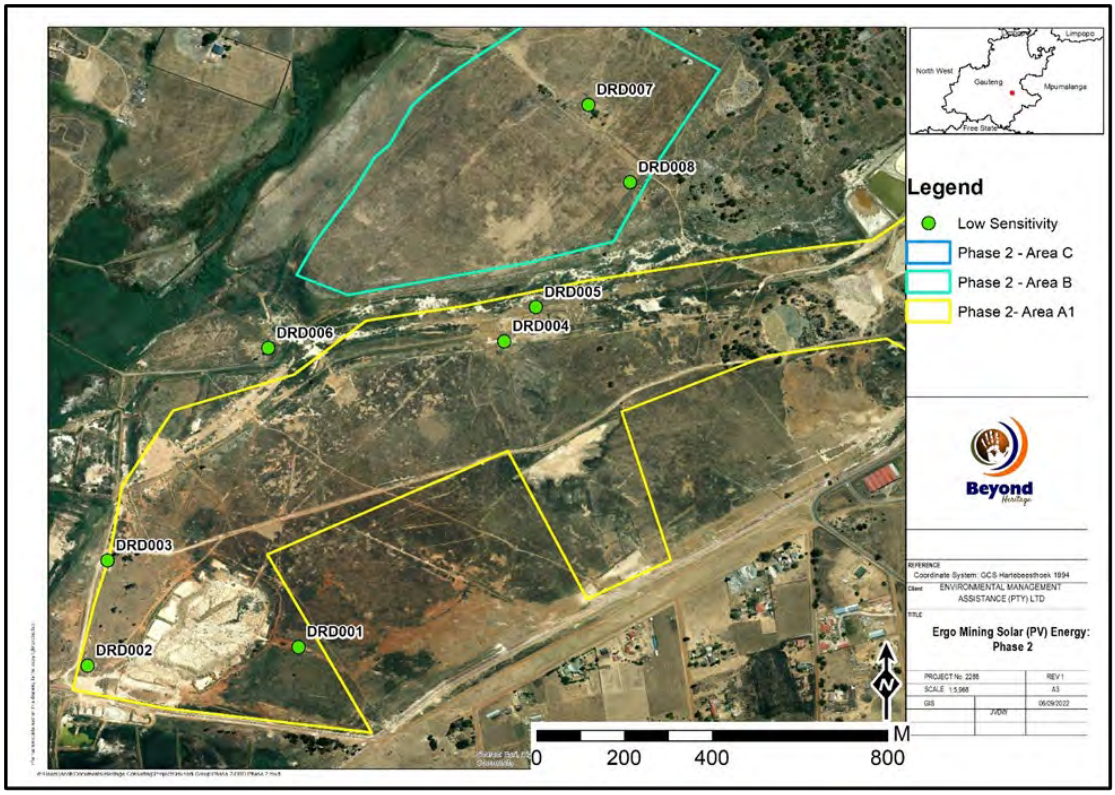


Figure 75: Site DRD001 to 008 in relation to the proposed impact area (preferred layout).

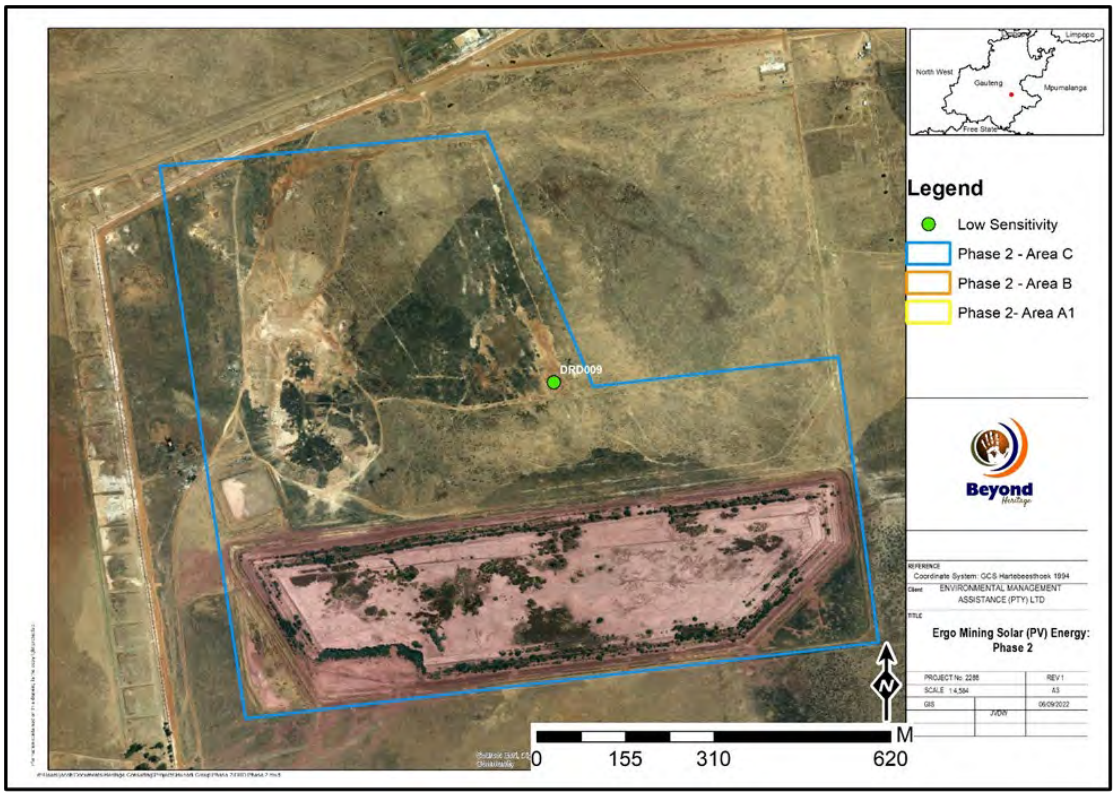


Figure 76: Site DRD009 in relation to the proposed impact area (portion of alternate layout).

Pre-Construction phase

It is assumed that the pre-construction phase involves the removal of topsoil and vegetation in impact areas as well as the establishment of infrastructure. These activities can have a negative and irreversible impact on heritage features if any occur. Impacts include destruction or partial destruction of non-renewable heritage resources.

Construction Phase

During this phase, the impacts and effects are similar in nature but more extensive than the pre-construction phase. Potential impacts include destruction or partial destruction of non-renewable heritage resources.

Operation Phase

No impacts are expected during the operation phase.

Table 53: Features that may be impacted on by the development and proposed mitigation measures.

Label	Location	Type Site	Description	Significance and Field Rating
DRD 001	28° 21' 28.1952" E 26° 17' 37.4135" S	Historical artefacts	Refuse material that is out of context is found where the remains of the reclaimed slimes dam that covered the entire Area A1 used to be.	GP C Low Significance
DRD 002	28° 21' 12.6217" E 26° 17' 38.7959" S	Historical artefacts	Historical/Recent refuse material that is out of context is found where the remains of the reclaimed slimes dam that covered the entire Area A1 used to be	GP C Low Significance
DRD 003	28° 21' 14.0797" E 26° 17' 31.0451" S	Historical artefacts	Refuse material that is out of context is found at the remains of reclaimed slimes dam is located on the western end of Area A1.	GP C Low Significance
DRD 004	28° 21' 43.3620" E 26° 17' 14.8669" S	Historical artefacts	Refuse material that is out of context is found at the remains of the reclaimed slimes dam that covered Area A1.	GP C Low Significance
DRD 005	28° 21' 45.7129" E 26° 17' 12.3503" S	Stone Age Artefacts	Low density of less than 1 artefact per 2m² of MSA lithics situated on the edge of the small stream between area A1 and B. These are washed and out of context.	GP C Low Significance
DRD 006	28° 21' 25.9596" E 26° 17' 15.3600" S	Ruin	Large broken down structure/foundation. The feature seems to have been a structure with multiple rooms. The feature is totally demolished and only the foundations are still visible as well as a small section of wall. Site measures approximately 20 x 20 m.	GP C Low Significance
DRD 007	28° 21' 49.5937" E 26° 16' 57.4213" S	Ruins	Large series of broken down structures and foundations situated in area B. Only the ephemeral remains of foundations are still visible.	GP C Low Significance

DRD 008	28° 21' 52.6643" E 26° 17' 03.1343" S	Structures	Three small cement structures. Possibly part of past mining infrastructure, currently occupied by squatters.	GP C Low Significance
DRD 009	28° 21' 02.9591" E 26° 18' 22.9393" S	Stone age Artefacts	Small collection of MSA flakes situated on a section of exposed gravels in Area A1 near the remnants of the reclaimed slimes dam and is out of context.	GP C Low Significance

Table 54: Construction and Operation of PV Plant

Activity:	Construction and Operation of PV Plant (Preferred and Alternative layout)				
Impact:	During the construction and operation phase activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological material or objects				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-Mitigation	5	3	4	3	36 Moderate
Post-Mitigation	5	2	2	3	27 Low
Is the Impact Reversible?	• Impacts to heritage resources are irreversible.				
Mitigation Measures:	• Implementation of Chance Find Procedure for the project; • Monitoring of the study area by the ECO; • If impacted on the standing structures (DRD008) must be assessed and recorded prior to the application for a destruction or alteration permit adhering to all legal requirements				
Cumulative impacts:	• The greater study area has been impacted on by various mining developments and the current development has a low to medium cumulative impact.				
Residual impacts:	• Although surface sites can be avoided or mitigated, there is a chance that completely buried sites would still be impacted on, but this cannot be quantified.				
Climate Change:	• NA				

Palaeontology Assessment

Most of both the northeast and the southwest sites are on very highly sensitive rocks of the Vryheid Formation and a site visit would normally be required BUT, the area is covered in vegetation that has been established on the rehabilitated mine dumps, or on the dumps (southern part of the southwest site). Thus the project footprints are on highly disturbed land. A site visit before new ground is broken would be a waste of time as there would be no fossils on the land surface.

Table 55: Palaeontological Impact Assessment (Construction)

Activity:	Construction of the Photovoltaic Plant (both alternatives)				
Impact:	NONE				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-Mitigation	1	0	0	0	0 Low

Post-Mitigation	1	0	0	0	0 Low
Is the Impact Reversible?	• No likelihood of fossils because the previous dump material is from a gold mine and far below the Vryheid Formation rocks; the material has been transported, sorted and the site reclaimed. • No impact				
Mitigation Measures:	• N/A				
Cumulative impacts:	• N/A				
Residual impacts:	• N/A				
Climate Change:	• N/A.				

Visual Assessment

The visual impact Assessment is applicable to both alternatives.

Potential visual impact of construction activities on sensitive visual receptors in close proximity to the proposed SEF and ancillary infrastructure.

During construction, there may be a noticeable increase in heavy vehicles utilising the roads to the development site that may cause, at the very least, a visual nuisance to other road users and landowners in the area. The construction activities may also visually impact residents of the Withok Small Holdings south of the development site.

Construction activities may potentially result in a moderate (significance rating = 56), temporary visual impact, that may be mitigated to moderate to potentially low (significance rating = 30)

Table 56: Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed PV facility.

Activity/Structure:	Construction activities: PV plant (both alternatives)				
Impact:	Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed PV facility.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-mitigation	2	4	8	4	56 Moderate
Post-mitigation	2	4	4	3	30 Moderate
Is the impact reversible?	Yes				
Mitigation measures:	Planning: • Retain and maintain natural vegetation immediately adjacent to the development footprint and any fire break buffer zones. Construction: • Construct temporary screens south of the PV plant construction site to shield construction activities from observers at the Withok Small Holdings. • Ensure that vegetation is not unnecessarily removed (outside of the development footprint) during the construction phase.				

	• Plan the placement of laydown areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e. in already disturbed areas) wherever possible. • Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. • Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities. • Reduce and control construction dust using approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent). • Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts. • Rehabilitate all disturbed areas immediately after the completion of construction works.
Cumulative impacts:	• None
Residual impacts:	• None, provided rehabilitation works are carried out as specified.
Climate change:	• N.A.

Potential visual impact on sensitive visual receptors located within a 1km radius of the PV facility structures.

The PV facility is expected to have a high visual impact (both alternatives) (significance rating = 72) on residents of the Withok Small Holdings or observers traveling along the secondary roads south of the facility, within a 1km radius of the operational PV structures, before mitigation.

Mitigation of this impact is possible and both specific measures as well as general "best practice" measures are recommended.

The mitigation of the primary visual impact of the operational PV plant on residents of the Withok Small Holdings and surrounds entails the construction of vegetated berms (or the planting of dense perennial vegetation cover) along the southern boundary of the central facility in order to screen it from observers at the Withok Small Holdings (the most affected sensitive receptors). The required height of the vegetation cover should be determined on site (but is expected to be in between 2m to 3m) and the most appropriate plant species informed by a local ecologist. It is expected that the effective implementation of this mitigation measure may reduce the potential visual impact to moderate (significance rating = 36).

Table 57: Visual impact on observers in close proximity to the proposed PV plant structures.

Activity/Structure:	PV plant (both alternatives)				
Impact:	Visual impact on residents of small holdings or observers travelling along the roads within a 1km radius of the PV facility structures.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-mitigation	4	4	10	4	72 High
Post-mitigation	4	4	4	3	36 Moderate

Is the impact reversible?	Yes, if the structures are removed and mitigation measures are implemented.
Mitigation measures:	Planning: •Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint. •Consult adjacent landowners (if present) in order to inform them of the development and to identify any (valid) visual impact concerns. Operations: •Plant dense perennial vegetation along the southern boundary of the PV plant in order to shield the operational plant from observers at the Withok Small Holdings. •Maintain the general appearance of the facility as a whole. Decommissioning: •Remove infrastructure not required for the post-decommissioning use. •Rehabilitate all affected areas. Consult an ecologist regarding rehabilitation specifications.
Cumulative impacts:	•None
Residual impacts:	•The visual impact will be removed after decommissioning, provided the PV facility infrastructure is removed. Failing this, the visual impact will remain.
Climate change:	•N.A.

Potential visual impact on sensitive visual receptors within the region (1 – 3km radius)

The operational PV facility could have a **moderate** visual impact (significance rating = 30) on observers located between a 1 – 3km radius of the PV facility structures (residents of the Withok Small Holdings (west) and the Witpoort Estate Small Holdings (north)), both before and after the implementation of mitigation measures.

Table 58: Visual impact of the proposed PV facility structures within the region.

Activity/Structure:	PV plant				
Impact:	Visual impact on observers travelling along the roads and residents at homesteads within the region (within a 1 – 3km radius of the PV facility structures).				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-mitigation	4	3	8	2	30 Moderate
Post-mitigation	4	3	8	2	30 Moderate
Is the impact reversible?	Yes				
Mitigation measures:	Planning: •Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint. Operations: •Maintain the general appearance of the facility as a whole. Decommissioning: •Remove infrastructure not required for the post-decommissioning use.				

	• Rehabilitate all affected areas. Consult an ecologist regarding rehabilitation specifications.
Cumulative impacts:	• None
Residual impacts:	• The visual impact will be removed after decommissioning, provided the PV facility infrastructure is removed. Failing this, the visual impact will remain.
Climate change:	• N.A.

Lighting impacts: Potential visual impact of operational, safety and security lighting of the facility at night on observers in close proximity to the proposed PV facility.

Lighting impacts relate to the effects of glare and sky glow. The source of glare light is unshielded luminaries which emit light in all directions and which are visible over long distances.

Sky glow is the condition where the night sky is illuminated when light reflects off particles in the atmosphere such as moisture, dust or smog. The sky glow intensifies with the increase in the amount of light sources. Each new light source, especially upwardly directed lighting, contribute to the increase in sky glow. It is possible that the PV facility may contribute to the effect of sky glow within the environment which is currently undeveloped.

Mitigation of direct lighting impacts and sky glow entails the pro-active design, planning and specification of lighting for the facility. The correct specification and placement of lighting and light fixtures for the PV facility and the ancillary infrastructure (e.g. workshop and storage facilities) will go far to contain rather than spread the light.

The following table summarises the assessment of this anticipated impact, which is likely to be of moderate significance, and may be mitigated to low.

Table 59: Impact table summarising the significance of visual impact of lighting at night on visual receptors in close proximity to the proposed PV facility.

Activity/Structure:	PV plant				
Impact:	Visual impact of lighting at night on sensitive visual receptors in close proximity to the proposed PV facility.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-mitigation	4	2	8	3	42 Moderate
Post-mitigation	4	2	6	2	24 Low
Is the impact reversible?	Yes				

Mitigation measures:	Planning: • Shield the sources of light with physical barriers (walls, vegetation, or the structure itself). • Limit mounting heights of lighting fixtures, or alternatively use foot-lights or bollard level lights. • Make use of minimum lumen or wattage in fixtures. • Make use of down-lighters, or shielded fixtures. • Make use of Low Pressure Sodium lighting or other types of low impact lighting. • Make use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.
Cumulative impacts:	• None
Residual impacts:	• The visual impact will be removed after decommissioning, provided the PV facility infrastructure is removed. Failing this, the visual impact will remain.
Climate change:	• N.A.

Solar glint and glare impacts: Potential visual impact of solar glint and glare as a visual distraction and possible air travel hazard

Glint and glare occur when the sun reflects off surfaces with specular (mirror-like) properties. Examples of these include glass windows, water bodies and potentially some solar energy generation technologies (e.g. parabolic troughs and CSP heliostats). Glint is generally of shorter duration and is described as "a momentary flash of bright light", whilst glare is the reflection of bright light for a longer duration.

The visual impact of glint and glare relates to the potential it has to negatively affect sensitive visual receptors in relative close proximity to the source (e.g. residents of neighbouring properties), or aviation safety risk for pilots (especially where the source interferes with the approach angle to the runway). The Federal Aviation Administration (FAA) of the United States of America have researched glare as a hazard for aviation pilots on final approach and may prescribe specific glint and glare studies for solar energy facilities in close proximity to aerodromes (airports, airfields, military airbases, etc.). It is generally possible to mitigate the potential glint and glare impacts through the design and careful placement of the infrastructure.

PV panels are designed to generate electricity by absorbing the rays of the sun and are therefore constructed of dark-coloured materials, and are covered by anti-reflective coatings. Indications are that as little as 2% of the incoming sunlight is reflected from the surface of modern PV panels (i.e. such as those proposed for the 40MW PV facility).

Sources: Blue Oak Energy, FAA and Meister Consultants Group.

The closest airfields/airports to the proposed SEF are the Brakpan and Springs Aerodromes, located respectively 7.5km north-west and 5.2km north-east of the proposed development site.

The proposed PV facility is not located near any airports or airfields and is located north of potentially sensitive visual receptors at the Withok Small Holdings. As such, the potential visual impact related to solar glint and glare is expected to be of **low** significance (significance rating = 20).

Table 60: Impact table summarising the significance of the visual impact of solar glint and glare as a visual distraction and possible air travel hazard.

Activity/Structure:	PV panels				
Impact:	The visual impact of solar glint and glare as a visual distraction and possible air travel hazard.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-mitigation	4	2	4	2	20 Low
Post-mitigation	N.A.	N.A.	N.A.	N.A.	N.A.
Is the impact reversible?	N.A.				
Mitigation measures:	•N.A.				
Cumulative impacts:	•None				
Residual impacts:	•N.A.				
Climate change:	•N.A.				

Ancillary infrastructure

On-site ancillary infrastructure associated with the PV facility includes smaller substations (inverters), battery storage units, 33kV cabling between the PV arrays, internal access roads, workshop, office buildings, etc.

No dedicated viewshed analyses have been generated for the ancillary infrastructure, as the range of visual exposure will fall within that of the PV arrays. The anticipated visual impact resulting from this infrastructure is likely to be of low significance both before and after mitigation.

Table 61: Visual impact of the ancillary infrastructure.

Activity/Structure:	PV plant ancillary infrastructure				
Impact:	Visual impact of the ancillary infrastructure during the operation phase on observers in close proximity to the structures.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-mitigation	4	4	4	2	24 Low
Post-mitigation	4	4	4	2	24 Low
Is the impact reversible?	Yes				

Mitigation measures:	Planning: •Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint. Operations: •Maintain the general appearance of the facility as a whole. Decommissioning: •Remove infrastructure not required for the post-decommissioning use. •Rehabilitate all affected areas. Consult an ecologist regarding rehabilitation specifications.
Cumulative impacts:	•None
Residual impacts:	•The visual impact will be removed after decommissioning, provided the PV facility infrastructure is removed. Failing this, the visual impact will remain.
Climate change:	•N.A.

Visual impact assessment: secondary impacts: The potential visual impact of the proposed PV facility on the sense of place of the region.

Sense of place refers to a unique experience of an environment by a user, based on his or her cognitive experience of the place. Visual criteria, specifically the visual character of an area (informed by a combination of aspects such as topography, level of development, vegetation, noteworthy features, cultural / historical features, etc.), plays a significant role.

An impact on the sense of place is one that alters the visual landscape to such an extent that the user experiences the environment differently, and more specifically, in a less appealing or less positive light.

The greater environment surrounding the site is not considered to have a high visual quality or specific sense of place due to the disturbed, altered and developed nature of the study area.

The anticipated visual impact of the proposed PV facility on the regional visual quality, and by implication, on the sense of place, is difficult to quantify, but is generally expected to be of low significance.

Table 62: The potential impact on the sense of place of the region.

Activity/Structure:	PV plant				
Impact:	The potential impact on the sense of place of the region.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-mitigation	4	2	4	2	20 Low
Post-mitigation	4	2	4	2	20 Low
Is the impact reversible?	Yes				

Mitigation measures:	Planning: • Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint/servitude. Operations: • Maintain the general appearance of the facility/servitude as a whole. Decommissioning: • Remove infrastructure not required for the post-decommissioning use. • Rehabilitate all affected areas. Consult an ecologist regarding rehabilitation specifications.
Cumulative impacts:	• None
Residual impacts:	• The visual impact will be removed after decommissioning, provided the PV facility infrastructure is removed. Failing this, the visual impact will remain.
Climate change:	• N.A.

Socio-economic Assessment

The socio-economic impact assessment (Appendix M) includes the socio-economic impacts of the two proposed alternative site layouts, as well as the "No-Go" alternative. The impact assessment considers the construction, operational, decommissioning (closure), and cumulative impacts of the proposed project for the preferred site and summarises the potential impacts of the Alternative site.

Construction Phase

Table 63: The Increased Employment Opportunities

Activity	Construction of Phase 2 solar panel fields
Description	The construction phase is anticipated to take twelve to fifteen months, and employment up to 273 people. This includes 9 management, 8 Professional, 48 skilled, 28 semi-skilled, and 204 unskilled positions. The estimated capital value of employment is R 1.4 billion. The management positions, and the majority of skilled and semi-skilled positions are likely to be sourced through an existing or preferred contractor (as appointed), due to the technical nature of the development. Where available, unskilled and possibly other levels will be sourced from the local community. Employment during this phase is considered temporary and not all opportunities will be for the entire duration of the construction phase. New opportunities generated by a development are considered a factor in socio-economic impact, although continuance of existing employment is also important. The potential of direct jobs to be generated in the local economy is approximately 25% direct impact, which means that the direct employment is estimated at approximately 68 new local jobs (National Treasury in Iliso, 2015). While most jobs will be sourced on a national or provincial level through the appointed contractor, the employment of up to 68 people locally (defined in this study as within 10 km of the project site) is considered one of the key socio-economic impacts. Together with skills development and transfer, this will contribute to long-term local economic development for individual income generators. There is a high rate of unemployment locally (33%), and so any employment would benefit the local communities, especially low-income groups.

	Indirect employment (or local multiplier effect) may be possible, should contractors or suppliers be sourced locally. It is anticipated that this will, however, not be significant, as existing contractors and suppliers from the broader region are likely to be used.					
Potential Impact	The impact is likely to be positive low, as the opportunities are likely to be short-term, and local employment few in number.					
Mitigation/ Enhancement	• Maximise and monitor local recruitment. • Consultation with local communities • Ensure local service providers are appointed from within Ekurhuleni Municipality as far as possible. • Prevent nepotism / corruption.					
Overall Impact	Should mitigation (enhancement) measures be put in place it is anticipated that a slightly higher number of local employment opportunities will be generated. This impact is likely to remain low, as it will be short-term, and the scale of the construction phase is not considered significant and will not result in noticeable socio-economic change.					
Mitigation (Enhancement)	Intensity	Extent	Duration	Consequence	Probability	Significance
Without	Low	Low	Low	Low	Medium	Very Low *Positive*
With	Medium	Low	Low	Medium	Medium	Low *Positive*
Reversibility	N/A - positive impact					
Cumulative impacts	None					
Residual impacts	None					
Climate Change	N/A					

Table 64: Increased Local Economic Development Opportunities

Activity	Development of the Phase 2 solar panel fields
Description	The total expected expenditure for the construction phase is estimated at R 237 million. Services are likely to include the provision of PV and infrastructure components, construction materials, machinery and equipment, labour and professional services for site establishment and construction. The spending could provide opportunities for local economic development and sustaining regional businesses. The local procurement of materials and services could benefit local businesses and indirectly provide employment and improved local spending in the short-term through the local multiplier effect. While much of the technology and services required are likely to already exist, there may be opportunities for local businesses to provide new services or for new businesses to develop.

Potential Impact	A number of the services required are likely to be sourced from within Gauteng, and a few services locally (e.g. Brakpan/Springs). The economic benefits may be realised on a regional or national level, with some local development. The spending associated with the proposed project is likely to be significant for the local economy; however, the majority of spending is likely to be on a regional or national level, and the duration of construction is short-term (16 months months). The impact on local economic development is likely to be of low significance. As the development is to occur within an existing urban area, the significance of the socio-economic impact is likely to be positive very low before mitigation/ enhancement.					
Mitigation/ Enhancement	• Ensure that goods and services are procured locally (from within 10 km radius or from within Ekurhuleni Municipality as a minimum), as far as possible.					
Overall Impact	Should goods and services be sourced locally, then the potential for economic benefits to be realised locally could improve, but only marginally due to the relatively small scale of the project (compared to major industrial or mining developments) and short construction phase. Little significant local, regional or national socio-economic change is likely to occur					
Mitigation (Enhancement)	Intensity	Extent	Duration	Consequence	Probability	Significance
Without	Low	Low	Low	Low	Medium	Very Low Positive
With	Medium	Low	Low	Medium	Medium	Low Positive
Reversibility	Highly reversable					
Cumulative impacts	None					
Residual impacts	None					
Climate Change	N/A					

Table 65: Reduced Public Safety

Activity	Development of Phase 2 solar panel fields
Description	During the construction phase, there is a high likelihood of an influx of labour, machinery, traffic, and potentially jobseekers into the area, over the fifteen-month construction phase. This is likely to increase the exposure of local public (including residents, roads users and businesses) to health and safety risks. These risks may include the potential for increased levels of crime, traffic accidents, and exposure to dust and vehicle emissions. Property R/9/131-IR is currently part of a mining area bordered by residential, agricultural and industrial activities. This area of Withok Estate AH has not had much operational mining activity for almost twenty years since the closure of the tailing facility on the PV site in 2002. The Ergo Mining Brakpan Plant and slurry pipeline have, however, been active continuously during this time, with associated noise (vehicles and pipeline), dust emissions (vehicles in winter)

	and visual impacts (plant and pipeline). Property R/183/117-IR is bordered by a mine tailings facility and agricultural land. There is very little development within the immediate vicinity of the site. The close proximity of this site to residential houses and businesses within Withok Estates AH means that these houses and business are likely to be the most exposed to public health and safety risks.
Potential Impact	Any increase in crime or other public health and safety risks could result in impacts on personal health and well-being, as well as associated costs, and loss of assets (e.g. through theft). The intensity of these impacts could potentially be high, with long-lasting effects on community members, and direct impacts on residents closest to the site. However as the construction phase is short-term, these potential timeframes for impacts to occur are likely to be limited. The potential impact is anticipated to be of high significance without mitigation.
Mitigation	• Appropriate securing of the site • Dust suppression • Stakeholder Engagement • Complaints Procedure
Overall Impact	Mitigation measures should reduce the intensity of the impacts and probability of them occurring. However, there may still be some risk of a moderate impact but reduce the probability to medium, resulting in a medium overall significance.

Mitigation	Intensity	Extent	Duration	Consequence	Probability	Significance
Without	Medium	High	Low	Medium	High	Moderate (Negative)
With	Low	High	Low	Medium	Low	Low (Negative)

Reversibility	Reversible
Cumulative impacts	Any additional impacts above the current state in terms of dust emission, safety and security of the neighbouring community is likely to enhance the already elevated levels of dust and security issues in the immediate area.
Residual impacts	Impacts of health and safety on social structure and individuals could have long-term implications for personal health and well-being.
Climate Change	N/A

Table 66: Increased Nuisance, Disruption and Indirect Costs

Activity	Development of the Phase 2 solar panel fields
Description	The construction phase is likely to alter the sense of place and impact the local residents through changing the local environment. These changes are likely to include: ► Increased noise (excavation, labour, machinery and traffic);

<table>
<tr><td></td><td>
▶ Reduced local air quality (dust, vehicle emissions);
▶ Increased traffic, machinery and people in the area; and
▶ Potentially an increased in crime and presence of “outsiders” and construction activities in the area.

An increase in the number of outsiders (including the presence of workers and jobseekers that may converge on the area) can create an environment that spreads social pathologies and ills. These are social factors, such a substance abuse, crime, gender-based violence and anti-social behaviour that can breakdown the normal structure of a community and reduce quality of life for local residents.

Currently, the Withok Estates AH and Witpoort AH areas are characterised as low- to middle-income and peri-urban, and is surrounded by mining and industrial activities, as well as low-income neighbourhoods. There are existing issues, such as high dust emissions in the winter[14], audible but non-intrusive industrial and traffic noise, security concerns and power outages. Based on the field work, these environmental aspects appear to be an accepted part of living and working in the local area. Businesses in the immediate vicinity (<200 m) include formal and informal businesses and ranging from waste management and automotive repair, to agricultural (livestock and crops), with some small-scale or home-based professional services (e.g. consulting and personal services). These could be impacted differently during construction.

Disrupting the local sense of place could result in people altering their daily activities, losing income due to noise and disruption (e.g. loss of clients to consulting services or reduced rental value of properties). These types of businesses are likely to rely on the sense of place, and disruptions could affect them and potentially reduce incomes. There may also be an impact on property values in the short-term, which is strongly linked to perception of value based on sense of place, access to resources and state of the surrounding environment (Property24, 2017).
</td></tr>
<tr><td>Potential Impact</td><td>The change in the physical environment is expected to change the day-to-day living of the Withok Estates AH and Witpoort Estates AH communities. The disruption to daily activities will be temporary for the fifteen-month period of construction, but potentially have a significant impact on livelihoods, social activities, and businesses. The impact, without mitigation, is however, likely to be of medium significance, due to the short-term nature of the impact.</td></tr>
<tr><td>Mitigation</td><td>
Management and mitigation for details, including:
▶ Ensure dust, noise and visual impact are minimised.
▶ Maximise and monitor local recruitment and procurement
▶ Complaints Procedure
</td></tr>
<tr><td>Overall Impact</td><td>With mitigation, it is likely that the intensity and probability of these impacts will be reduced, but the overall impact is likely to remain of medium significance, as the activity itself will be disruptive, especially for local residents in the Withok Estates AH and Witpoort Estates AH.</td></tr>
</table>

Mitigation	Intensity	Extent	Duration	Consequence	Probability	Significance
Without	High	Medium	Low	Medium	High	*Moderate (Negative)*
With	Medium	Medium	Low	Medium	Medium	*Low (Negative)*
Reversibility	Reversible					

4) [14] Based on responses from a local resident regarding dust emissions from vehicles on site and reported complaints to Ergo Mining (Ergo Environmental Manager, 2021).

Cumulative impacts	None
Residual impacts	The impact on neighbouring residents would contribute to the change in sense of place.
Climate Change	N/A

Table 67: Reduced access to livelihood resources

Activity	Development of Phase 2 solar panel fields (R/183/117-IR and R/9/131-IR)					
Description	The number of local subsistence farmers who informally graze livestock on the proposed project site and surrounding areas is unknown. These livestock owners are understood to live on the smallholdings near the project site. The site forms part of a much larger open area that is evidently accessed regularly by local livestock owners/farmers. The PV panel sites (~120 ha) is approximately 33% of the open land (estimated at 360 ha) used for such grazing activities. The removal of this amount of open veld from the available space could potentially have an impact on the livelihoods of the substance farmers who rely on it. The change in nature of the area may have an adverse effect on risk to livestock and herders (e.g. traffic accidents with livestock). It is assumed, however, that noise and dust from construction will not impact on these businesses and activities. The PV facility will also be located on private land, and not communal or municipal-owned, and there are numerous other areas available for informal gazing in the immediate area.					
Potential Impact	There may be a moderate impact on local subsistence farmers, as the construction phase will have short-term impacts (noise, dust), and the long-term impact of securing the PV sites (preventing access for grazing) over the operational phase is anticipated to be low. But as there is likely to be some disruption, without mitigation, the significance of the impact could be medium.					
Mitigation	• Engage with the representatives of local communities, • Fence off and secure the construction areas • Complaints Procedure					
Overall Impact	With mitigation, it is unlikely that the construction phase will have a long-term impact on the livelihoods and businesses in the area. While there might be some short-term impacts, the overall significance is likely to be low.					
Mitigation	Intensity	Extent	Duration	Consequence	Probability	Significance
Without	Low	Medium	Low	Low	High	*Low (Negative)*
With	Very Low	Medium	Low	Low	Low	*Very Low (Negative)*
Reversibility	Reversable					
Cumulative impacts	None					

Residual impacts	None
Climate Change	N/A

Operational Phase

Table 68: Increased Employment Opportunities

Activity	Operation of the Phase 2 solar panel fields					
Description	The operational phase (~30 years) is anticipated to create 27 new direct job opportunities. Including 2 management, 2 professional, 5 skilled, 5 semi-skilled and 14 unskilled. The total employment cost is anticipated to be approximately R 4.7 million per annum (increasing 6% incrementally per year). It is not known where these employees will be sourced from, but it is likely that they will be a mix of regional and local appointments, as it will depend on the skills required and available. It is anticipated that as many as possible will be obtained locally in line with the Ergo Mining Social and Labour Plan (Ergo Mining, 2018). Indirect employment (e.g. through services providers) could potentially improve the opportunities. However the services are likely to be specialised and therefore sourced regionally.					
Potential Impact	The impact of ten new opportunities is unlikely to have a significant impact on the local or regional economy but will have a positive impact on individuals and households over the operational phase.					
Mitigation/ Enhancement	• Maximise and monitor local recruitment • Ensure local employment and local services providers are appointed where possible. • Prevent nepotism / corruption.					
Overall Impact	The promotion of local employment and procurement may have a minor impact by increasing local employment opportunities; however this impact is likely to remain low.					
Mitigation	Intensity	Extent	Duration	Consequence	Probability	Significance
Without	Very Low	Low	Very High	Low	Low	*Very Low (Positive)*
With	Low	Low	Very High	Medium	Medium	*Low (Positive)*
Reversibility	N/A					
Cumulative impacts	None					
Residual impacts	None					
Climate Change	N/A					

Table 69: Increased local economic stimulation opportunities

Activity	Operation of the Phase 2 solar panel fields					
Description	There are unlikely to be significant local business and economic development opportunities during the operational phase. The services and materials required are likely to be low in volume, with periodic high-value input (e.g. replacements or servicing of components). The expected annual operational expenditure is anticipated to be R 1.5 million (escalating at 6% increase per annum). The opportunity cost associated with the proposed project should, however, be considered. The current land use for the PV site (mining and unused agriculture) was not contributing directly to the local, regional or national economy. The operation of the PV facility will provide stable energy supply for the Ergo Mining Brakpan Plant and Brakpan/Withok Tailings Dam facility (referred to below as Ergo Plant), and thereby sustain the employment and economic contributions of the plant locally and to the broader Ergo business on a regional level. In addition, it will contribute to sustaining the services providers, employment and businesses associated with the Ergo Plant, and the potential for future development. The operation of the PV facility will provide stable energy supply for the Ergo Plant, and thereby sustain the employment and economic contributions of the plant locally and to the broader Ergo business on a regional level. In addition, it will contribute to sustaining the services providers, employment and businesses associated with the Ergo Plant, and the potential for future development. The provision of renewable energy to the Ergo Plant can also provide the opportunity for Eskom to supply other sectors in the region with energy. The current unplanned outages and load shedding prevent industry from operating efficiently and reduces local economic growth. This has a local as well as national impact on people and the economy. The impact of the proposed project is unlikely to resolve the national energy crisis but will contribute by relieving some pressure on the local or regional provision of energy. The use of renewable energy also provides broader socio-economic opportunities, including reduced dependency on non-renewable resources and the development of associated skills and technology.					
Potential Impact	The potential impact of the proposed project on maintaining the local economy through economic contributions (with limited new input), is considered of low significance, with high-long-term positive impacts, and regional implications. The change in nature of the socio-economic environment, locally, however, is unlikely to be significant, with mostly indirect regional opportunities being realised as a result of operations.					
Mitigation/ Enhancement	• Ensure local procurement of goods and services • Maximise and monitor local content. • Manage community expectations					
Overall Impact	The promotion of local procurement may have a minor impact by increasing local employment opportunities; however this impact is unlikely to be significant.					
Mitigation	Intensity	Extent	Duration	Consequence	Probability	Significance
Without	Very Low	Low	Very High	Low	Low	*Very Low (Positive)*
With	Low	Low	Very High	Medium	Medium	*Low (Positive)*
Reversibility	N/A					

Cumulative impacts	None
residual impacts	none
Climate Change	N/A

Table 70: Increased Nuisance, Disruption and Indirect Costs

Activity	Operation of the Phase 2 solar panel fields
Description	The operational phase is likely to change the nature of the immediate area surrounding the PV solar fields. It is likely that the facility will disrupt the immediate visual landscape and could change the sense of place. Any significant disruption could change how immediately adjacent residents live, work and experience this area. This is likely to be through the following key factors: • Visual intrusion of the PV panels - change in viewshed from smallholdings in Withok Estates AH; • Increased security and maintenance vehicles (dust, noise and risk of accidents); • Increased crime (presence of high-value technology could attract an undesirable element and spread into the adjacent area); The PV solar sites are currently bordered by residential, agricultural and industrial activities. These conflicting land uses currently generate a number of social issues, such as crime (evident by private security in the area) and dust emissions from vehicles on unpaved roads (common to mining and industrial areas). There is likely to be a change in nature of the area, especially on the Ergo mining land (R/183/117-IR) as PV facilities can be visually intrusive for neighbouring properties and those within the view shed (up to 1 km). It is anticipated that there will be little additional traffic (other than a small number of staff and security patrols in the area) or noise generate during the operational phase. It must be noted, however, that should the traffic volume, infrastructure, noise or crime increase from the current levels, it is likely to have an impact on neighbouring residents. Businesses and agricultural activities are unlikely to be notably affected. Residents, who choose to live in the area due to the visual and social landscape, could be disrupted through reduced access to houses or increase cost of vehicles (due to road degradation of roads), deter people from renting or buying properties in the area and cause loss of assets (due to theft) and other costs to (e.g. increased dust requiring additional cleaning). These impacts are likely to reduce over time, and as the sense of place mostly reverts for a majority of residents once the reality of the PV facility becomes the new status quo. The exception is likely to be residential houses along Tenth Street immediately facing the site. The proximity and change in visual environment are highly likely to alter their sense of place and potentially impact their personal and financial well-being.
Potential Impact	The impact on sense of place and change in nature of the immediate area around the PV facility is likely to have a high impact on approximately seven houses and businesses located closest to the site (along Tenth street). Other properties (located further than between 500 m and 1 km from the site) may also be affected by visual, noise, security and dust impacts, but to a lesser degree. The overall impact is anticipated to be long-term and high intensity if not managed correctly.
Mitigation	• Locate transformers and other noise producing infrastructure on the western side of the facility, or as far from residential houses as possible.

	• Ensure access roads are maintained. • Implement the recommendations of the visual impact assessment (Refer to Appendix M) • Managed dust generated from the site and access roads. • Complaints Procedure					
Overall Impact	With mitigation (without relocation), the impact is likely to be reduced to a medium significance. While the intensity and probably could be managed, it is unlikely that mitigation will remove all risk and impact to the mediate community					
Mitigation	Intensity	Extent	Duration	Consequence	Probability	Significance
Without	Medium	Medium	Medium	Medium	High	*Moderate (Negative)*
With	Low	Medium	Medium	Medium	Low	*Low (Negative)*
Reversibility	Highly reversable					
Cumulative impacts	None					
Residual impacts	None					
Climate Change	N/A					

Table 71: Reduced public safety and security

Activity	Operation of the Phase 2 solar panel fields
Description	The operational phase is likely to make the area more secure, as the PV sites will be fenced and monitored due to the high value of the equipment on site. However, this could also attract criminal activity to the area, as cables and equipment for the PV facility are likely to be targeted for theft. In addition, people use the Ergo slurry pipeline and open veld to move between the industrial and residential areas and graze cattle. The PV facility is unlikely to change these activities but could attract more attention from people passing by or seeking jobs and could draw attention to the houses on Tenth Street and provide opportunities for theft or criminal activities. The close proximity of this site to residential houses and businesses within Withok Estates AH means that these houses and business are likely to be the most exposed to public health and safety risks.
Potential Impact	Any increase in crime or other public health and safety risks could result in impacts on personal health and well-being, as well as associated and costs, and loss of assets (e.g. through theft). The intensity of these impacts could potentially be high, with long-lasting effects on community members, and direct impacts on residents closest to the site. Although the likelihood and intensity is low, the potential impact is long-term and therefore of high significance without mitigation.
Mitigation	• Secure and monitor the site for theft and public health and safety risks.

	• Complaints Procedure					
Overall Impact	Mitigation measures should reduce the intensity of the impacts and probability of them occurring. However there may still be some risk of a moderate impact but reduce the probability to medium, resulting in a low overall significance.					
Mitigation	Intensity	Extent	Duration	Consequence	Probability	Significance
Without	High	Medium	High	High	Medium	Moderate (Negative)
With	Medium	High	Low	Medium	Medium	Low (Negative)
Reversibility	Reversible through decommissioning only – long-term impact throughout operational phase.					
Cumulative impacts	None					
Residual impacts	Impacts of health and safety on social structure and individuals could have long-term implications for personal health and well-being.					
Climate Change	N/A					

Decommissioning Phase

Table 72: Loss of permanent jobs

Activity	Decommissioning of the Phase 2 solar panel fields					
Description	The total number of permanent employment opportunities is anticipated to be up to 27, from the local area and further afield (depending on the skills available and services required). The loss of these permanent employment from the operational phase post the 20-year operational period as a result of the decommissioning could therefore affect several households. It is possible that the skills acquired through employment could be transferred to other opportunities in the area.					
Potential Impact	The loss of employment will be permanent and will definitely occur. However, the intensity is anticipated to be very low, due to the low number of jobs and regional impact.					
Mitigation	• Ensure transferable skills are developed • Identify opportunities for employees to be redeployed to other operations.					
Overall Impact	With mitigation, the probability of people losing employment will be reduced significantly and reduce the overall impact to low significance.					
Mitigation	Intensity	Extent	Duration	Consequence	Probability	Significance
Without	Very Low	High	Very high	Medium	Very High	Moderate (Negative)

With	Very Low	High	Very high	Medium	Medium	Low (Negative)
Reversibility	Reversible					
Cumulative impacts	N/A					
Residual impacts	N/A					
Climate Change	N/A					

Table 73: Loss of local economic opportunities

Activity	Decommissioning of the Phase 2 solar panel fields					
Description	The decommissioning of the PV facility and associated infrastructure is likely to remove direct and indirect opportunities for local and regional businesses to benefit from providing goods and services to the facility. The nature and extent of this economic benefit is unknown, as the lifespan of the facility is anticipated to be over twenty years. The loss of this benefit could impact on employment and revenue for suppliers, however as this is not likely to be the only facility they service, it is unlikely that there will be a notable economic or socio-economic impact.					
Potential Impact	The intensity is likely to be low, although the impact will be permanent and regional in nature. The impact is therefore anticipated to be of medium significance					
Mitigation	• Manage decommission process and timeously notify services providers of closure. • Ensure service providers are provided with an opportunity to bid on or undertake decommission contract work where feasible.					
Overall Impact	The overall impact, with mitigation, is anticipate dot be low, as the likelihood and intensity will be very low.					
Mitigation	Intensity	Extent	Duration	Consequence	Probability	Significance
Without	Low	Very High	Very High	High	Medium	Moderate (Negative)
With	Very Low	Very High	Very High	High	Very Low	Low (Negative)
Reversibility	Reversible					
Cumulative impacts	None					
Residual impacts	None					
Climate Change	N/A					

Table 74: Increased temporary employment

Activity	Decommissioning of the Phase 2 solar panel fields					
Description	The total number of employment opportunities generated by the decommissioning process is anticipated to be 127, with 6 management, 9 skilled and 127 unskilled. While the management and skilled positions are likely to be sourced from existing operations or contractors, the unskilled positions could be sourced locally. Employment during this phase is considered temporary and not all opportunities will be for the entire duration of the decommissioning phase. Only new opportunities generated by a decommissioning are considered the key factor in socio-economic impact. There is a high rate of unemployment locally (33%), and so any employment would benefit the local communities, especially low-income groups. Indirect employment (or local multiplier effect) may be possible, should contractors or suppliers be sourced locally. It is anticipated that this will, however, not be significant, as existing contractors and suppliers from the broader region are likely to be used.					
Potential Impact	New employment opportunities will be temporary and may only partially be sourced from the local area. The intensity is anticipated to be very low, due to the low number of jobs and regional extent.					
Mitigation/ Enhancement	• Maximise and monitor local recruitment. • Consultation with local communities • Ensure local services providers are appointed. • Prevent nepotism / corruption.					
Overall Impact	Should mitigation measures be put in place it is anticipated that a slightly higher number of local employment opportunities will be generated. This impact is likely to remain low, as it will be short-term, and the scale of the construction phase is not considered significant compared to mining or large industrial facilities.					
Mitigation	Intensity	Extent	Duration	Consequence	Probability	Significance
Without	Very Low	Low	Low	Very Low	Low	Insignificant (Positive)
With	Low	Low	Low	Low	Medium	Very Low (Positive)
Reversibility	N/A					
Cumulative impacts	N/A					
Residual impacts	N/A					
Climate Change	N/A					

No-Development Alternative

EIA regulations require consideration of the "Do Nothing" or "No Development" Alternative. In this case the status quo would remain, and no aspect component of the proposed project would be developed.

Table 75: Loss of Local Economic Development Potential

Activity	None					
Description	The construction and operational phases of the proposed project will require goods and services, which will contribute toward the growth of the local economy and sustain employment through the Ergo Mining Brakpan Plant and Brakpan/Withok Tailings Dam facility. Without these aspects, the current situation (status quo) is likely to remain. The lack of opportunity is unlikely to directly affect regional operations and services providers, but there may be a loss for local businesses that is replaceable over time as other opportunities arise. Currently Ergo Mining experiences regular grid outages as a result of an unstable Eskom grid in the local area, and energy curtailment during national events of 25% of the load for up to 8 hours. This has a significant impact on production value, with a direct loss of R 10 million to date. This issue is unlikely to change, as energy supply in South Africa continues to decline, and demand continues to rise. In addition, the loss of the potential for renewable energy generation and reduced load on Eskom is potentially a loss for the local or regional economy, as well as a loss of renewable energy infrastructure and skills development opportunities.					
Potential Impact	The impact of the no-development alternative on the local economy could be significant, as ongoing outages and curtailment could affect long-terms business and growth for Ergo, as well as employment and other related businesses in the local area and on a regional scale if left unchanged. The overall impact is likely to be moderate in intensity, but regional in extend, and long-term in duration (as other opportunities/markets are lost). The overall impact is anticipated to be low.					
Mitigation	N/A					
Overall Impact	N/A					
Mitigation	Intensity	Extent	Duration	Consequence	Probability	Significance
Without	Medium	High	High	Medium	Very High	Moderate (Negative)
Reversibility	N/A					
Cumulative impacts	N/A					
Residual impacts	N/A					
Climate Change	N/A					

Table 76: Loss of Employment opportunities

Activity	None

Description	The no-development alternative would result in the loss of direct and indirect employment opportunities. The construction, operation and decommissioning phases are likely to generate up to 300 employment opportunities (273 temporary during construction and decommissioning; and 27 long-term during operational phase). It is likely that 25% of these will be from the local communities (area of Indirect Impact), which equates to approximately 68 temporary jobs and 7 permanent jobs which will be lost if the project does not go ahead. In addition, indirect employment generation would also be lost through lack of local procurement of goods and services.					
Potential Impact	As with economic opportunities, the impact on employment loss is unlikely to be significant, as the proposed project is small in scale, and so not going ahead will only marginally affect employment opportunities in general. However, the loss for individuals, especially locally could be significant. The overall impact is likely to be very low in intensity, but regional in extend, and medium-term in duration (as other opportunities/markets arise). The overall impact is anticipated to be low.					
Mitigation	N/A					
Mitigation	Intensity	Extent	Duration	Consequence	Probability	Significance
Without	Very Low	High	Medium	Low	Very High	Low (Negative)
Reversibility	Reversible					
Cumulative impacts	N/A					
Residual impacts	N/A					
Climate Change	N/A					

Traffic Impact Assessment

It is expected that the proposed Phase 2 of the development will generate 21 peak hour trips during the AM and PM peak hours in the construction phase and Phase 1 & 2 of the proposed development will generate 7 peak hour trips during the operational phase. The estimated trip generation for the construction and operational phase are shown in Traffic Impact Assessment (Refer to Appendix O).

Table 77: Assessment of Environmental Impact of Transport Activities during Construction

Activity:	Construction phase of Ergo SEF: Phase 2				
Impact:	Construction vehicles and access roads				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-Mitigation	1	2	2	3	15 Low
Post-Mitigation	1	2	2	3	15 Low
Is the Impact Reversible?	Yes				

Mitigation Measures:	Adherence to OHSA regulations during the construction phase
Cumulative impacts:	None
Residual impacts:	None
Climate Change:	N/A

Table 78: Assessment of Environmental Impact of Transport Activities during Operational Phase

Activity:	Operations of Ergo SEF: Phase 2				
Impact:	Operation staff transportation trips, maintenance and delivery trips.				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Pre-Mitigation	4	2	2	3	24 Low
Post-Mitigation	4	2	2	3	24 Low
Is the Impact Reversible?	No				
Mitigation Measures:	Environmentally friendly transportation alternatives for staff etc.				
Cumulative impacts:	None				
Residual impacts:	None				
Climate Change:	N/A				

Cumulative Impact Assessment

Cumulative effects are commonly understood to be impacts from different projects that combine to result in significant change, which could be larger than the sum of all the individual impacts. The cumulative impacts have been assessed below, according to the guidance offered by the DEA (DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism (DEAT), Pretoria) and IFC guidelines (Good Practice Handbook - Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets" (International Finance Corporation)) on this matter.

Besides the Phase 1 ERGO Mining Solar Energy Facility there are two more authorised solar energy facilities within the larger region. These are a 3MW PV facility at Mapleton (13.1km south-west of the proposed ERGO Gold PV facility) and a Concentrated Solar Power (CSP) facility (unknown generating capacity) near Endicott (22.9km to the east-south-east), and one unauthorised PV facility about 11.3km North East of the proposed Ergo SEF (115MW Calodex Solar Photovoltaic).

Avifauna: The avifaunal specialist report describes the landscape of the proposed SEF as already highly disturbed and quite heavily urbanised. Surrounded by urban developments and the three other solar

facilities that exist within a 30km radius of the site do present some level of cumulative risk to bird species in the area. An increase in mortality is expected from the proposed SEF. The alteration of the grassland and wetland habitats that do exist on site from habitat loss during construction and from altered run-off and chemical pollutants further present problems for existing bird species.

Despite these impacts, the bird species present are already tolerant to human activates as aspects like mining, lighting and urbanisation already exist in the vicinity. This factor coupled with the absence of any Red list species, has determined that the impacts from the proposed PV facility will be LOW. However, the addition of other multiple other facilities in the area will result in the overall cumulative impacts as being MODERATE.

Soils, Land capability and Agricultural potential: Three main impacts face the health of wetlands present at the proposed PV facility site: Loss of agricultural productive land; Soil Compaction leading to erosion and sedimentation and Soil pollution. All mitigation measure outlined in the specialist report should be followed appropriately to ensure that impacts are minimized. Should all mitigation measures be headed, the risk posed by the SEF will be LOW. However, further development within the area would put the cumulative impact level to MODERATE.

Hydrology: There are two areas of concern regarding the water courses associated with the proposed PV facility site both of which have been determined to be LOW. They are sedimentation and siltation on water courses and the alteration of natural drainage patterns which both have the potential to alter the aquatic ecology and natural flow regimes of the affected aquatic ecosystems. No major cumulative threats have been identified from this perspective.

Wetlands: Three main impacts face the health of wetlands present at the proposed PV facility site: Sedimentation from soil erosion; pollution of the water resources and encroachment of alien vegetation. All mitigation measure outlined in the specialist report should be followed appropriately to ensure that impacts are minimized. Should all mitigation measures be headed, the risk posed by the SEF will be LOW. However, further development within the area would put the cumulative impact level to MODERATE.

Heritage: The cumulative impact by addition of the proposed Ergo Mine PV Power Project on the existing heritage resources within the Project Site is rated as LOW pre- and post-mitigation. No damage is expected to occur to relevant heritage features identified in the assessment but adherence to the recommendations made in the specialist report should be followed to ensure loss of unknown historical features does not occur.

Visual: Given the constrained visual exposure of the proposed SEF, the built-up nature of the study area and the relatively long distances between the latter two facilities, no cumulative visual exposure (or combined visual impact) is expected. The location of the Phase 2 PV facility immediately adjacent to the authorised Phase 1 PV facility, will concentrate the visual exposure of the PV facilities, effectively into one larger PV facility. This is preferred, rather than spreading the visual exposure by placing the PV facilities further away from each other. The cumulative visual impact is therefore expected to remain within acceptable limits.

Socio economic: The proposed SEF offers the local area and its communities with an inflow of economic development and higher growth potential in the form of the creation of new jobs, both temporary and permanent, and opportunities for local businesses to benefit from the activities associated with the

construction, operation and decommissioning of the mine. However, there are negative connotations for such a project to the surrounding areas. Increases in ambient noise, changes of the visual environment, higher levels of traffic and potential harm to incomes are to be expected. This has the potential to alter the sense of place for residents in surrounding areas, which could lower the value of the properties in the area and dissuade potential developers from developing in the region. Furthermore, with the increase in traffic, job seekers and people to the area, it is believed that this may increase the crime rates in the area leading to further loss of incomes and reduced safety for residents and workers.

Should further development of the area take place, many of the aspects mentioned above will most likely be amplified. For example, more development would require labour which could be sourced to local communities thus further increasing the income to the surrounding areas. On the opposite end, it would increase the number of people coming to the region and possibly make communities in the local regions targets for crime. The positive aspects associated with the project are more temporary and are of low levels of benefit while the negative aspects will most likely affect the local communities for a longer period. Thus, it is imperative that all mitigation measures outlined in the SIA be followed to ensure minimum negative impacts occur to local communities. Without mitigation, the risk posed from the cumulative impacts to the local communities is HIGH but with mitigation it will be MEDIUM.

Table 79: Potential cumulative visual impact of the solar energy facilities

Activity/Structure:	The potential cumulative visual impact of the solar energy facilities on the visual quality of the landscape.				
Impact:	Cumulative				
Significance rating:	Duration	Extent	Magnitude	Probability	Significance
Overall impact of the proposed project considered in isolation (with mitigation)	4	4	4	3	36
Cumulative impact of the project and other projects within the area (with mitigation)	4	3	0	1	7
Is the impact reversible?	No, only best practise measures can be implemented				
Mitigation measures:	Planning: *Generic best practise mitigation/management measures:* • Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint/servitude. Operations: • Maintain the general appearance of the facility/servitude as a whole. Decommissioning: • Remove infrastructure not required for the post-decommissioning use. • Rehabilitate all affected areas. Consult an ecologist regarding rehabilitation specifications.				
Cumulative impacts:	• None				
Residual impacts:	• The visual impact will be removed after decommissioning, provided the PV facility infrastructure is removed. Failing this, the visual impact will remain.				

vi. METHODOLOGY USED IN DETERMINING AND RAKING THE NATURE, SIGNIFICANCE. CONSEQUENCES, EXTENT, DURTION AND PROBABILITY OF POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS

In this assessment, the impacts are described in terms of their characteristics, including the impact's spatial and temporal features (namely extent, duration, probability and magnitude). While an impact assessment typically focuses on the negative impacts, an impact can also be positive. The definitions of the terms used in this Basic Assessment are described in Table 80 below.

Table 80: Impact Characteristics

Characteristic	Definition	Terms	Scoring
Duration	The time period over which a resource / receptor is affected.	Temporary - (period of less than 1 year - negligible/ pre-construction/ construction) Short term - period of less than 5 years ie commissioning/operational period Medium term - period of less than 15 years ie operational period Long term - period of less than 20 years ie life of project Permanent - a period that exceeds the life of project– ie irreversible.	Temporary – 1 Short term – 2 Medium term – 3 Long term – 4 Permanent – 5
Extent	The reach of the impact (ie physical distance an impact will extend to)	On-site - impacts that are limited to the Project site. Local - impacts that are limited to the Project site and adjacent properties. Regional - impacts that are experienced at a regional scale, ie Gauteng. National - impacts that are experienced at a national scale. Trans-boundary/International - impacts that are experienced outside of South Africa.	On-site – 1 Local – 2 Regional – 3 National – 4 International – 5
Probability	Measure of the probability with which the impact is expected to occur	Unlikely - probably will not happen Improbable - some possibility, but low likelihood Probable - distinct possibility) Highly probable - most likely Definite - impact will occur regardless of any prevention measures	Unlikely – 1 Improbable – 2 Probable – 3 Highly probable – 4 Definite – 5
Magnitude	A measure of the damage that the	No effect - will have no effect on the environment	No effect – 0

Characteristic	Definition	Terms	Scoring
	impact will cause if it does occur	Minor – minor and will not result in an impact on processes Low – low and will cause a slight impact on processes Moderate – moderate and will result in processes continuing but in a modified way High - processes are altered to the extent that they temporarily cease Very high - results in complete destruction of patterns and permanent cessation of processes	Minor – 2 Low – 4 Moderate – 6 High – 8 Very high – 10

The significance (quantification) of potential environmental impacts identified during the Basic Assessment have been determined using a ranking scale, based on the following (terminology has been taken from the Guideline Documentation on EIA Regulations, of the Department of Environmental Affairs and Tourism, April 1998):

Occurrence

- Probability of occurrence (how likely is it that the impact may occur?)
- Duration of occurrence (how long may it last?)

Severity

- Magnitude (severity) of impact (will the impact be of high, moderate or low severity?)
- Scale/extent of impact (will the impact affect the national, regional or local environment, or only that of the site?)

The environmental significance of each potential impact is assessed using the following formula:

Significance Points (SP) = (Magnitude + Duration + Extent) x Probability

The maximum value is 100 Significance Points (SP). Potential environmental impacts were rated as high, moderate or low significance on the following basis:

- < 30 significance points = LOW environmental significance.
- 30- 60 significance points = MODERATE/ MEDIUM environmental significance
- >60 significance points = HIGH environmental significance

vii. THE POSITIVE AND NEGATIVE IMPACTS THAT THE PROPOSED ACTIVITY AND ALTERNATIVES WILL HAVE ON THE ENVIRONMENT AND THE COMMUNITY THAT MAY BE AFFECTED

The possible positive and negative impacts that the proposed Ergo SEF may pose was discussed in detail in section v).

The advantages and disadvantages of the preferred alternative site layout have been discussed in the various specialist reports as well as in section g).

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

Part B (EMPr) of this document provides the detailed management plan of each impact and risks. The management plan addresses mitigation measures in detail.

Proposed mitigation measures are discussed in detail in section v).

All concerns raised by the I&AP as part of the PPP listed in the previous section has been incorporated and addressed and forms part of the consideration of mitigation measures.

ix. MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

The preferred site was selected based on the homogenous and disturbed nature of the sites assessed and was selected from a technical and feasibility aspect for the mine. The proposed site currently belongs to Ergo Mining, and an investigation into historic aerial imagery of the site was undertaken. Portions of the study site are visible in historical aerial imagery from 1938 (Figure 77). In this imagery, development within the area is apparent with mining operations underway at the current location of the Brakpan Plant. Development is furthermore noted in the form of roads and scattered residential buildings. Agricultural activities, particularly the cultivation of crops can be seen throughout the study site outside of and adjacent to water resources. The historic Tsakane Clay Grassland vegetation type is furthermore evident in the imagery, particulary in undisturbed portions of the site. These areas were most likely used for the grazing of livestock.

Figure 77: Historic aerial imagery from 1938 showing portions of the study site, with mining already underway, the creation of road networks and the cultivation of crops

In imagery from 1985 the use of large portions of both the preferred and alternative layout sites as both mining areas and/or tailings dams is clearly evident (Figure 78). These impacts are indications of the disturbed nature of the study site as a result of the use of this area for mining activities, with the soil profiles in these mined areas forever changed by these activities. These impacts on the soils within the study area reduce the likelihood of the use of these areas for crop cultivation in the future.

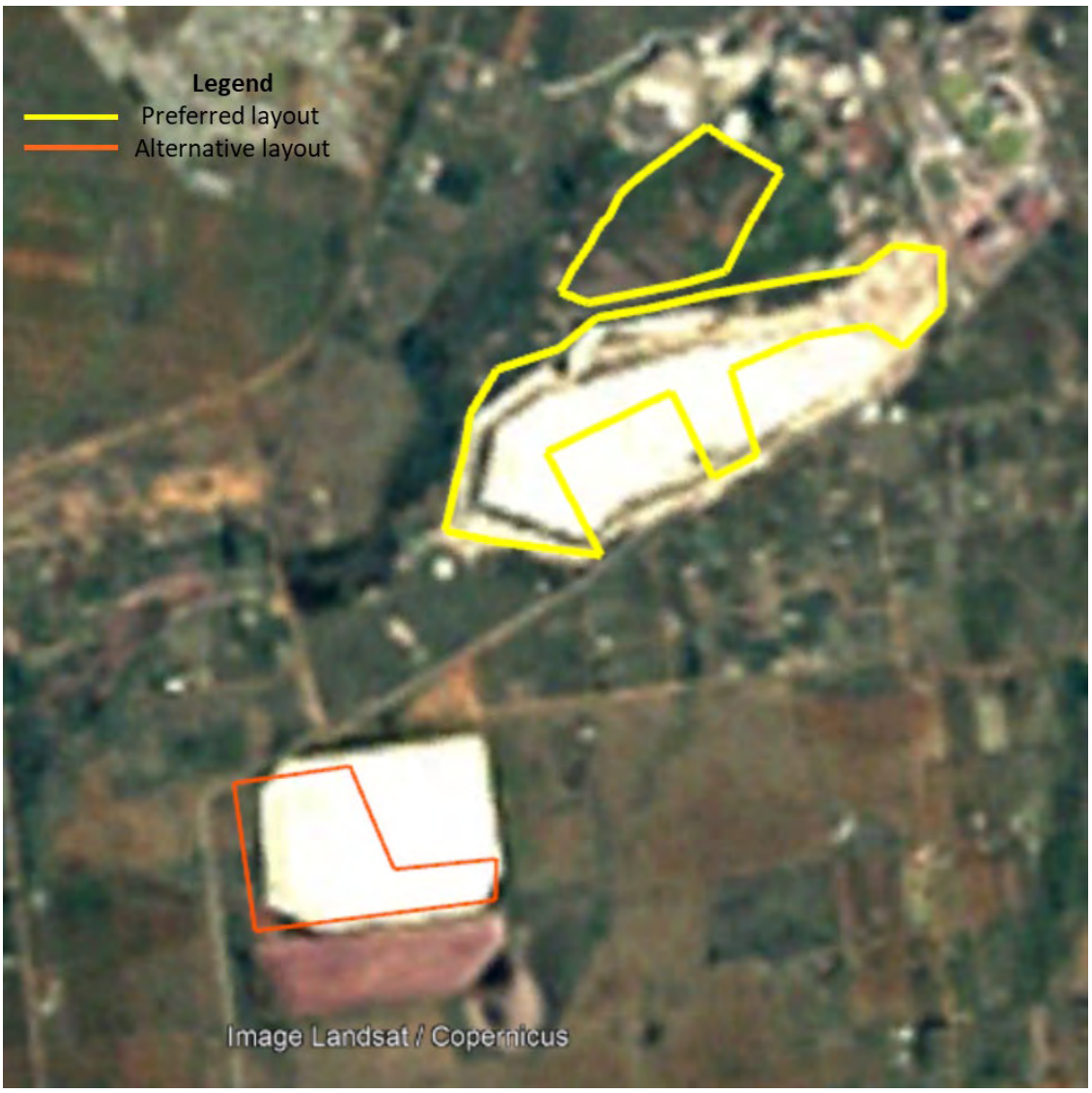


Figure 78: Historic aerial imagery from 1985

Aerial imagery from 2002 shows the mining and remining of both the preferred and alternative layout sites (Figure 79). Haul roads, mining operations, and the continued transformation of the site is apparent in the aerial imagery. Areas adjacent to the mining operations, are no longer utilised for the cultivation of crops, with agricultural practices largely abandoned within the area. Some small-scale cultivation is evident in Portion 272 of the Farm Witpoortjie 117 and the larger study area are utilised for livestock grazing.

Figure 79: Aerial imagery from 2002

Mining was then discontinued within the study site and the rehabilitation of the area undertaken, from approximately 2004/2005. Soil is seen to be deposited within the disturbed sites as well as the re-grassing of these areas. This is shown in aerial imagery from 2008 (Figure 80). Topsoil stockpiles are still evident in the southern portion of the study area. Furthermore Portion 272 of the Farm Witpoortjie 117 is no longer utilised for crop cultivation.

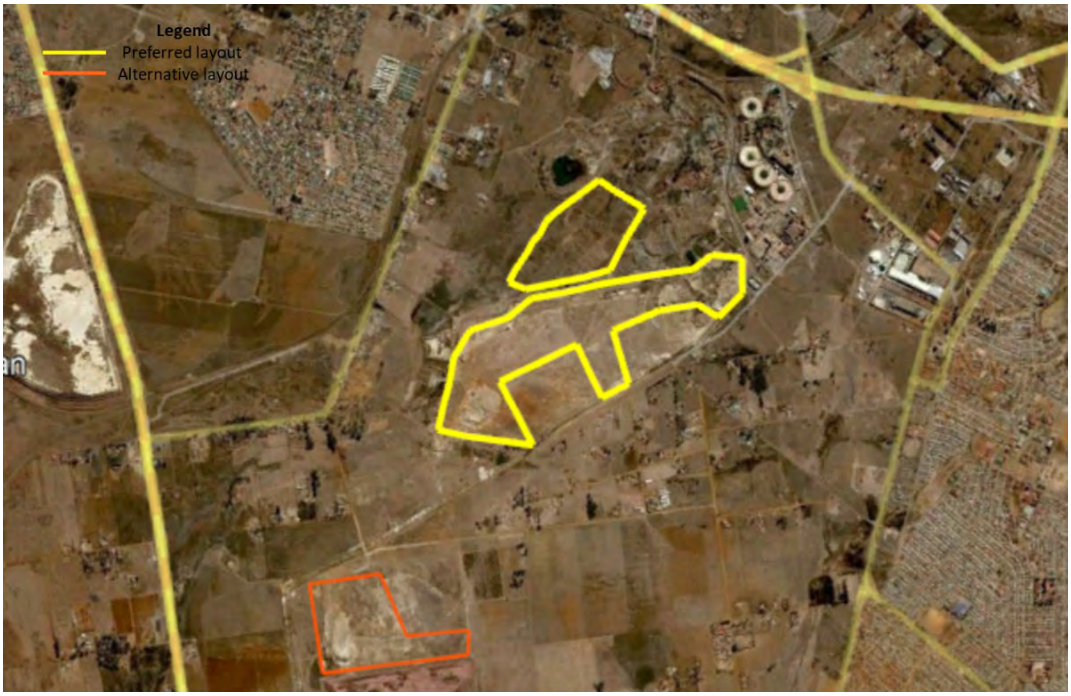


Figure 80: Aerial imagery from 2008

The most current aerial imagery available on Google EarthTm is from March 2022 (Figure 81). This shows the completed rehabilitation process of the disturbed portions of the study site, with these areas now grassed and utilised for livestock grazing. The operations associated with historic and current mining activities however dominate the area and have had an impact on the quality of the soils within the study site.

Figure 81: Current aerial imagery (2022)

x. STATEMENT MOTIVATING THE ALTERNATIVE DEVELOPMENT LOCATION WITHIN THE OVERALL SITE

The site / layout alternatives as assessed through this EIA report was identified for consideration due to the homogenous and historically disturbed nature of the sites, and was selected from a technical and feasibility aspect for the mine.

The preferred layout does not traverse sensitive biodiversity areas in comparison to the layout alternative. The preferred PV layout was therefore optimised based on the site sensitivity as identified and assessed through the specialist studies. Developing the preferred site with panels will keep development clustered closer to the approved Ergo Phase 1 SEF area (19.9MW), and existing active mine areas and maintain

the impact footprint and associated anthropogenic activity (traffic, maintenance work) to a consolidated area; it will also result in maintaining the open spaces within and around the alternative site which is within the less disturbed Rietspruit Tributary catchment area. The access road is proposed over existing mine roads and tracks; the latter will result in minimal removal of vegetation; no significant loss of fauna habitat is expected, limited to marginal impact to the edges, dominated by disturbed and modified habitats.

The layout alternative is not preferred mainly based on avifaunal sensitivity. All of the observed bird species have the potential to be displaced by the proposed 40MW SEF as a result of habitat transformation and disturbance. However, these species have persisted despite existing disturbance within the study area. This resilience, coupled with the fact that similar habitat is available throughout the broader area, means that the displacement impact will not be of regional or national significance. While no active breeding locations were observed, historical African Grass Owl and African Marsh Harrier breeding locations do occur within close proximity to the proposed development area, particularly the Alternative Layout.

i. FULL DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY, ASSESS AND RANK THE IMPACTS THE ACTIVITY WILL IMPOSE ON THE PREFERRED DEVELOPMENT FOOTPRINT THROUGH THE LIFE OF THE ACTIVITY

The impact assessment process may be summarised as follows:

1. Identification of proposed activities including their nature and duration;
2. Screening of activities likely to result in impacts or risks;
3. Utilisation of the various specialists to assess and score preliminary impacts and risks identified (refer to section v);
4. Inclusion of I&AP comment regarding impact identification and assessment;
5. Finalisation of impact identification and scoring.

j. ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties)

This section identifies all potential impacts associated to the proposed activities associated with the construction, operation, and decommissioning phase of the proposed Ergo SEF. Each possible impact has been rated according to the methodology described in section ***vi)***. Pre- and Post- significance ratings were established and are represented in Table 82. Each score rating indicates the significance of the potential impacts and risks and is colour coded according to Table 81.

Table 81: Explanation of colour indicator

Colour	Significance Points	Explanation
	≤ 30	LOW environmental significance
	31 - 60	MODERATE environmental significance
	> 60	HIGH environmental significance

To avoid replication of information, only the mitigation type will be summarised. The detailed mitigation measures are found in section B to this report and Section v) of this EIA report.

Table 82: Potential environmental impacts and the assessment thereof

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
Flora						
Clearing of vegetation at construction footprints	Destruction of natural vegetation	Flora (Vegetation)	Construction	48	Control	21
	Destruction of modified and secondary vegetation			40		25
	Exposure to erosion and subsequent sedimentation or pollution of proximate moist grassland		Construction	48	Control/ Remedy	21
	Removal / Destruction of protected plants and plants of conservation concern		Construction	48	Control	21
Disturbed soils due to construction and trampling	Potential increase in invasive vegetation			40	Control	21
Clearing of vegetation and soil disturbance	Compaction and destruction of soils	Flora and Soils	Construction /Operational	48	Control	21
Fauna						
Solar Panel Construction and to a lesser extent edge	Destruction of significant and / or sensitive fauna habitat	Fauna sensitive areas	Construction	52	Stop/ Modify/	8

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
affects during Operational Phase			Operational	16	Control/ Remedy	8
	Hindrance, trapping, killing of fauna, focussing on potential TOP species in the project area	TOP Species	Construction	30	Stop/ Control/ Remedy	16
			Operational	18		10
	Contamination of fauna environment	Water bodies and tributaries	Construction	55	Stop/ Modify/ Control/ Remedy	14
			Operational	20		18
Avifauna						
PV Construction	Displacement of SCC as a result of habitat loss and/or transformation	Species of Conservation Concern	Construction	27	Avoid/ Manage	14
	Displacement of SCC as a result of disturbance		Construction	27	Control	14
Operation of PV	Assessment of mortality due to collision with the PV panels	Avifauna	Operational	42	Control/ Monitoring	16
	Assessment of habitat impacts associated with altered run-off and chemical pollution			20		8

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
Surface Water Assessment and Storm water management (Hydrological)						
Construction/establishment, operation and decommissioning of PV facility	Flooding	Storm water management	Construction/ Operational/ Decommissioning	36	Control	20
	Sedimentation and siltation of water courses	Water courses		36	Avoid/ Control	24
	Alteration of the natural drainage patterns	Drainage	Operational	48	Control	48
Wetland and Aquatic						
PV Construction	Soil erosion and sedimentation of wetland systems	Soil and wetlands	Construction	70	Control/ Rehabilitation	30
	Pollution of wetland systems	Wetlands		70	Avoid/ Control	27
	Encroachment of alien invasive vegetation	Vegetation		33	Control	14
Construction of pedestrian bridge across HGM1	Soil erosion	Soil within wetland		48		27
Construction of drainage channels	Erosion gullies	Wetlands		32		10

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
PV Operational	Soil erosion and sedimentation of wetland systems	Soil and wetlands	Operational	33	Control/ Rehabilitation	16
	Pollution of wetland systems	Wetlands		33	Avoid/ Control	16
	Encroachment of alien invasive vegetation	Vegetation		52	Control	16
Existence of bridge across HGM 1	Sediment movement, excessive erosion	Wetland and flow dynamics		33		16
Operation of drainage channels	Erosion gullies	Wetlands		33		16
Soils, land capability and agricultural potential assessment						
PV Construction	Loss of agricultural productive land within the study area	Agricultural	Construction	4	Control	4
	Soil Compaction leading to erosion and sedimentation	Soil		30		12
	Soil Pollution					
PV Operational	Soil Compaction leading to erosion and sedimentation		Operational	33	Control	16
	Soil Pollution			33		16

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
Heritage						
PV Construction and Operational	Disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or archaeological material or objects remove from its original position archaeological material or objects	archaeological material or objects	Construction /Operational	36	Control/ monitor	27
Palaeontology						
PV Construction and Operational	None	No likelihood of fossils	Construction/ Operational	0	N/A	0
Visual						
Construction activities: PV plant	Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed PV facility	Sensitive visual receptors	Construction	56	Control	30

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
Operational activities: PV plant	Visual impact on residents of small holdings or observers travelling along the roads within a 1km radius of the PV facility structures.	Observers in close proximity	Operational	72	Control/ Decommission	36
Construction: PV plant	Visual impact on observers travelling along the roads and residents at homesteads within the region (within a 1 – 3km radius of the PV facility structures).	Observers travelling along the roads and residents at homesteads within the region	Construction and Operation	30		30
Operational activities: PV plant	Visual impact of lighting at night on sensitive visual receptors in close proximity to the proposed PV facility.	Sensitive visual receptors		42	Planning	24
	The visual impact of solar glint and glare as a visual distraction and possible air travel hazard.	Visual receptors	Operation	20	n/a	n/a
	Visual impact of the ancillary infrastructure during the operation phase on observers in close proximity to the structures.	Observers in close proximity	Operation	24	Control/ Decommission	24
Construction and Operational activities: PV plant	The potential impact on the sense of place of the region.	Sense of place	Construction and Operation	20	Control/ Decommission	20
Socio-economic						

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
Employment of workers Procurement of construction materials	Increased employment opportunities	Socio economic Community upliftment	Construction	Very Low	Control (Enhancement)	Low
	Local economic development			Very Low		Low
	Reduced public safety	Community members/ Residents in close proximity		Medium	Control Monitor	Low
	Increased nuisance, disruption and indirect costs	Livelihoods, social activities, and businesses in close proximity		Medium		Low
	Reduced access to livelihood resources	Local subsistence farmers / commercial agriculture		Low		Very Low
Employment of workers	Increased employment opportunities	Socio economic Community upliftment	Operational	Very Low	Control (Enhancement)	Low
	Increased local economic stimulation opportunities			Very Low		Low
	Increased nuisance, disruption and indirect costs	Livelihoods, social activities, and		Medium	Control/	Low

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
		businesses in close proximity			Monitor	
Operation of PV solar facility and associated infrastructure	Reduced public safety and security	Crime / other public health and safety risks		Medium		Low
Decommissioning of PV solar facility and associated infrastructure	Loss of permanent jobs	Loss of employment	Decommissioning	Medium	Control	Low
	Loss of local economic opportunities			Medium	Manage/ Control	Low
	Increased temporary employment	Temporary employment		Insignificant		Very Low
Traffic						
Construction phase PV solar facility and associated infrastructure	Construction vehicles and access roads	Increased Traffic	Construction	Low	Control	Low
Operational phase PV solar	Operation staff transportation trips, maintenance and delivery trips.		Operational	Low		Low

k. Summary of Specialist Reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMEN-DATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED
Flora Terrestrial biodiversity Impact Assessment (Appendix E)	The proposed site falls in an area that is listed by the National Screening Tool as being of 'High' terrestrial biodiversity. Furthermore, the Screening Tool lists a 'Medium' sensitivity for plant species, indicating that there is a likelihood of plant species of conservation concern being present on or in proximity to the sites. The final terrestrial vegetation report thus comprises a terrestrial (vegetation) assessment, with reference to the occurrence or possible occurrence of plant species of conservation concern on the site. The vegetation report included a site visit, as well as data collected during prior work undertaken in the area for the approved Phase 1 (19.9MW) project. The proposed PV facility will be in the Ekurhuleni Municipality of Gauteng. The site is within the quarter degree square 2628AD. Much of the vegetation on the proposed sites were historically disturbed by either cultivation, paddocks surrounding slimes dams, or the presence and maintenance of the slurry pipes. Parts of the proposed site comprise historic slimes dams, that was remined and left to naturally revegetate. Most of the eastern section is modified or built-up. The vegetation present were delineated follows: • Secondary grassland; • Moist grassland; and • Modified vegetation. The preliminary Site Ecological Importance is described below:	X	All recommendations are included in the EMPr (Part B of this report).

Preliminary broad vegetation community	*Preliminary* Site Ecological Importance (SEI) – mitigation
Secondary grasslands	Very-low (Minimise & Restore)
Modified vegetation	Very-low (Minimise & Restore)
Moist grassland	Medium (Minimise & Restore)

Most of the proposed site comprise secondary grassland that was either historically cultivated or contained slimes dams and other mining infrastructure. Some ecological functions are restored in the secondary grasslands, although the species diversity is likely low with limited potential to support plant species of conservation concern. Development activities of medium to high impact are acceptable in the secondary grasslands, followed by appropriate restoration activities where needed. Most of the eastern extent of the proposed site as well as large soil heaps or remnant slimes material were classified as modified land. These areas are developable and of little to no conservation concern.

The sites fall in an area that is listed by the National Screening Tool as being of 'High' terrestrial biodiversity. Furthermore, the Screening Tool lists a 'Medium' sensitivity for plant species, indicating that there is a likelihood of plant species of conservation concern being present. The results found that although the sites are within an area of high terrestrial biodiversity, the vegetation is disturbed and in a secondary state. However, it does retain some ecological function but the rating of "high" is challenged. Also, no sensitive plant species were recorded or are expected to be present in the Preferred and Alternative sites.

Due to the modified and secondary nature of the vegetation, the proposed development of the PV facility, will likely have no to limited impact on sensitive vegetation. The impacts on the Preferred and Alternative sites are comparable with the greatest impact on moist grasslands. The wetland assessment must be consulted for the definitive boundaries of wetlands. No plant species of conservation concern were recorded in the moist grasslands and therefore the wetland specialist recommendations and buffers take preference. One protected plant species was recorded within the secondary grassland on the Alternative Site.

Although the impacts are comparable, this report motivates the approval of the Optimized Layout on the Preferred Site. Development on the Preferred Sites will concentrate the proposed activities in an area adjacent to the current mining activities and infrastructure. This will reduce edge effects to natural areas, as well as fragmentation of larger, connected open spaces. Development on the Alternative Site will fragment a larger open space that comprise of secondary and good condition grassland (Phase 1 assessment, Dimela Eco Consulting, 2021). The Alternative site is also closer to good condition grassland and moist grassland present in the Withok Estates Agricultural holdings north of the Alternative Site. If for any reason the Preferred Site is not approved, this report has no objection with the Alternative site being used for the proposed PV facility.

For ease of reference, the following table summarises results of the assessment as per the main requirements of the Protocols for Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial (Vegetation) Biodiversity as published on 20 March 2020.

Biodiversity (vegetation) aspect	Result
Conservation Plan Category: CBA and ESA	Reason for the CBA The CBAs within and around the proposed sites are classified based on the potential habitat for plant species of conservation concern and the potential presence of primary vegetation Can ESA / CBA be maintained? The ESA on both sites correspond with secondary grasslands. The vegetation within the CBA on the Preferred site was historically cultivated, currently comprise secondary grassland and no plant species of conservation concern were recorded or are expected to be present. The CBA on the sites functions rather as an ESA and if movement corridors along the Withokspruit and moist grasslands remain undeveloped, then the function can be maintained. Impact on species composition and structure of vegetation Areas that will be developed are proposed to be contained within the existing secondary and modified vegetation. If mitigation is implemented no natural to semi-natural grasslands will be affected.
Ecosystem threat status	Impact on ecosystem threat status

		No natural or good condition vegetation is present within the Preferred- or Alternative sites. The vegetation is not representative of Tskane Clay Grassland and therefore can not contribute to the conservation thereof. The remnant Tsakane Clay Grassland around the site boundaries are also in a secondary to highly degraded state and the impact of the proposed development on the threat status of this ecosystem is negligible. Impact on explicit subtypes in the vegetation; and the impact on overall species and ecosystem diversity of the site; See above.		
	Protected Areas	• Not applicable		
	Strategic Water Source Areas (SWSA):	Impact(s) on the terrestrial habitat of a SWSA The site is not situated within a SWSA, however clearing of vegetation can have an impact on water infiltration and flow dynamics to the moist grassland and downstream watercourses. Impacts of the proposed development on the SWSA water quality and quantity Erosion, sedimentation and pollution caused by clearing of vegetation for the development, could impact on the downstream water quality temporarily (e.g. during construction). Once indigenous vegetation has re-established or recovered, the impact will be negligible, provided that impermeable surfaces are limited, and no runoff water are directed towards the moist grassland		
	National Freshwater Ecosystems Priority Areas (NFEPA):	See wetland assessment.		
	Indigenous forest	Not applicable		

	Sensitive Areas	• The buffer area to the moist grasslands, as delineated by the wetland specialist must be avoided. • As per the GDARD Requirements for Biodiversity Assessments Version 2 (2012): "All good condition natural vegetation must be designated as ecologically sensitive". Rocky grassland to the southwest of the Preferred site and the north of the Alternative site may be in a good ecological condition and falls within a CBA that forms part of a Critically Endangered Ecosystem. This area is outside of the Project Area of Influence (PAOI) and may not be considered for any development or edge effects.		
	No go areas	Avoid direct impacts to moist grasslands and no edge effects or scope creep towards rocky grasslands outside of the PAOI are allowed.		
	Plant species of conservation concern	• No plant species of conservation concern were recorded or are expected to be present		
	Main impacts:	The main impacts expected are as follows: • Destruction of natural vegetation of medium sensitivity (rocky- and moist grassland) • Destruction of modified vegetation of low sensitivity • Exposure to erosion and subsequent sedimentation or pollution of proximate moist grassland (watercourse) • Unlikely destruction of protected plants and plants of conservation concern • Potential increase in invasive vegetation • Compaction and destruction of soils		
	Cumulative impacts:	• If mitigation measures are adequately implemented, no cumulative impacts are expected.		
	Residual impacts:	• Trampling and edge effects; and • Impacts to the watercourse such as runoff from roads.		

Fauna Terrestrial biodiversity Impact Assessment (Appendix F)	The site and surrounds rank as high sensitivity (EIA Screening Report) for terrestrial biodiversity, but given the history of the site (old tailings facilities, historical mine areas, historical and current cultivation areas), it is expected that the on-site biodiversity value to terrestrial fauna is low. A full biodiversity impact assessment, in line with the new environmental theme's protocols where relevant to terrestrial fauna, has been completed with focus on the ecological corridors and natural habitat units. The site and surrounds rank as medium and low sensitivity (EIA Screening Report) for animal species, with one butterfly (*Aloeides dentatis dentatis*) and two mammals (*Ourebia ourebi ourebi* and *Hydrictis maculicollis*) listed as potential species of conservation concern (SCC). Due to the current status of the site in terms of historical land use and impacts, it is expected that these animals are unlikely to permanently occur in the project area, or at least be restricted to the less disturbed habitats where these are ecologically connected, and the bulk of the site will have low value for significant animal species. In terms of the fauna biodiversity and animal species findings, the following impacts could be significant during construction phase and have been assessed further: • Destruction of fauna habitat, specifically potential TOPS habitat (designated highly sensitive areas). • Hindering or interfering with TOP fauna species that may traverse through the project area. • Contaminated or silt-loaded runoff to on-site and nearby aquatic ecosystems within the project area. Impacts have been identified to be, at most, of moderate significance and can all be mitigated to low impact with vigilant activity and good house-keeping practices on site. In terms of the two alternative sites, the preferred site has more natural habitat units than the alternative site and is closer to areas designated as highly sensitive areas (should be avoided pending wetland specialist findings), making it marginally more important in terms of terrestrial fauna than the alternative site. However, developing the preferred site with panels will keep development clustered (closer to the main Phase 2 panel area and existing active mine areas) and maintain the impact footprint and associated anthropogenic activity (traffic, maintenance work) to a consolidated area; it will also result in maintaining the open spaces within and around the alternative site which is within the less disturbed Rietspruit Tributary catchment area. Therefore, in terms of terrestrial fauna, either alternative site is considered appropriate for development. The access road is proposed over existing mine roads and tracks; the latter will result in minimal removal of vegetation; no significant loss of fauna habitat is expected, limited to marginal impact to the edges, dominated by disturbed and modified habitats (as per photographic evidence). In terms of terrestrial fauna biodiversity, no additional faunal assessments or studies are deemed necessary. There is no reason for not authorising the activity as long as the following recommendations are adhered to:	X	

	• Recommendations of the flora and wetland specialist must be implemented on site. • Any areas designated as highly sensitive by the flora and wetland specialists should be considered as highly sensitive in terms of fauna (unique and unmodified fauna habitat provision) and should be considered no-go areas. • Staff and contractors must be made aware of the potential activity of SCCs (Spotted-necked Otter, Oribi and *Aloeides dentatis dentatis*) and the confirmed TOPS (Giant Bullfrog) and likely TOPS (Southern Reedbuck and Serval) in the surrounds and highly likely TOPS (South African Hedgehog) in the development areas and report sightings of these species to the Environmental Control Officer. • The mitigation measures in this report and that of the flora report and wetland report must be included within the environmental management programme and implemented on site.		
Avifauna Impact Assessment (Appendix G)	The proposed 40MW SEF development area and PAOI are located within a single primary vegetation division namely the Grassland Biome, specifically Tsakane Clay Grassland and Soweto Highveld Grassland. Of South Africa's 841 bird species, 350 occur in the Grassland Biome. This includes 29 species of conservation concern (i.e. those species declining in numbers), ten endemics, and as many as 40 specialist species that are exclusively dependent on grassland habitat. Grasslands represent a significant feeding area for many bird species in densely populated areas and will typically attract Lanner Falcon, African Marsh-harrier, Black-winged Pratincole, Abdim's Stork and White Stork observed during the SABAP2 survey period. Grassland patches are also a favourite foraging area for game birds such as francolins, spurfowl and Helmeted Guineafowl. This in turn could attract large raptors i.e. Martial Eagle because of both the presence and accessibility of prey. It is important to note that the area that has been earmarked for the proposed 40MW SEF development has experienced significant transformation in the form of mining and urbanisation which dominate the landscape. Although parts of the development area have been largely rehabilitated and the grassland habitat has recovered, fairly significant levels of disturbance persist in the form of vehicle and pedestrian traffic, pastoral activities and mining operations in the immediate surrounds. SABAP2 reporting rates for SCC potentially occurring in grassland habitat in the study area are very low and the absence of these grassland dependent SCC at the proposed 40MW SEF development area is an indication of the significant levels of human activity and disturbance. Therefore, the potential displacement impacts as a result of habitat loss and disturbance associated with the construction and operation of the proposed 40MW SEF are likely to be low for the aforementioned grassland dependent species. The effects of any development on birds are highly variable and depend on a wide range of factors including the specification of the development, the topography of the surrounding land, the habitats affected and the number and diversity of species present. With so many variables involved, the impacts of each development must be assessed individually. Each of these potential effects can interact, either increasing the overall impact on birds or, in some cases, reducing a particular impact (for example where habitat loss and disturbance causes a reduction in birds using an area which may then reduce the risk of collision). The principal areas of concern for SCC and non-SCC SEF sensitive species related to the proposed 40MW SEF development are:	X	

	• Displacement due to habitat loss in the physical SEF infrastructure footprint; • Displacement due to disturbance associated with construction and operation/maintenance of the proposed 40MW SEF development; • Mortality due to collision with the PV panels; and • Displacement due to habitat loss as a result of altered run-off and the use of chemical pollutants. Sensitive features present within the PAOI include the river systems, waterbodies, wetland areas and breeding locations to the north-west, west and south of the proposed SEF layout boundaries (Figure 68). The river and wetlands have been buffered by 100m and assigned a HIGH sensitivity rating, owing to the degree of connectivity with other ecosystems and their suitability to support African Grass Owl and African Marsh Harrier. The African Marsh Harrier breeding and foraging habitat is buffered by 100m and assigned a HIGH sensitivity rating. Similarly, the African Grass Owl breeding location has been buffered by 100m and assigned a HIGH sensitivity rating in accordance with GDARD requirements. Suitable foraging habitat occurs on the neighbouring properties for those priority SCC whose distribution overlaps with the proposed development areas – this habitat has been assigned a MEDIUM sensitivity rating (Figure 69). The remaining areas earmarked for the proposed development are heavily transformed and considered to be of LOW sensitivity. One of the objectives of this study is to determine the preferred PV SEF development layout that poses the least impact to the avifaunal community, particularly the sensitive SCC present within the study area. The two alternatives that have been proposed for the 40MW SEF i.e. Preferred Layout and Alternative Layout occur within the same pentad. They are comprised of identical vegetation units and subjected to similar existing disturbances associated with the land use practices in the area and are therefore likely to be identical in terms of species diversity and density too. With this in mind, the selection of a preferred Site Layout has been determined using observations of available micro habitat, species occurrence and the location of the Site Layouts in relation to existing infrastructure. The Preferred Layout avoids the areas of HIGH sensitivity within the PAOI, particularly the African Grass Owl and African Marsh Harrier breeding locations. This layout also contains areas that are heavily transformed and subject to significant levels of existing habitat degradation and disturbance. It is on this basis that the Preferred Layout is considered to pose the least impact to the resident avifaunal community. In conclusion, the habitat within which the proposed development area is located MODERATELY to HIGHLY sensitive from a potential bird impact perspective. In recent years, anthropogenic impacts, mostly in the form of mining and urbanisation have largely transformed the landscape resulting in a negative impact on avifaunal diversity and abundance with the study area. This is reflected in the low reporting rates for priority species, which may also indicate that levels of disturbance are high. The construction of the proposed 40MW SEF will result in impacts of MODERATE to LOW significance to birds occurring in the vicinity of the new infrastructure, which can be reduced to negligible levels through the application of mitigation measures. Given the presence of existing habitat degradation and disturbance, it is anticipated that the proposed 40MW SEF can be constructed within the Preferred Layout with acceptable levels of impact on the resident avifauna subject to the following recommendations:		

	• Conduct a pre-construction inspection (avifaunal walk-through) of the final SEF layout, to identify any species that may be breeding on the authorised development site or within the immediate surrounds to ensure that any impacts likely to affect breeding species (if any) are adequately managed. • Construction activities (i.e. all staff, vehicle and machinery) should be restricted to the immediate footprint of the infrastructure. • Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of avifaunal species. • Care should be taken not to introduce or propagate alien plant species/weeds during construction. • Mitigation is complex at electrical structures since there are many factors that contribute to collisions with the PV panels. It is therefore recommended that mitigation be applied reactively once the SEF, if a significant problem is detected. Monitoring of this infrastructure for bird fatalities must be built into the operational environmental management programme for the facility. • A carefully considered surface water/drainage management plan must be developed for the site including attention to the use of environmentally friendly cleaning chemicals. • Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum. • In addition to this, the normal suite of environmental good practices should be applied, such as ensuring strict control of staff, vehicles and machinery on site and limiting the creation of new roads as far as possible. In accordance with the outcomes of the Avifauna impact assessment (Appendix G), the proposed 40MW SEF is **not deemed to present unmitigable negative environmental issues or impacts**. It is this specialist's opinion that the construction of the 40MW SEF will result in acceptable levels of impact on the resident avifauna **subject to the selection of the preferred layout alternative and the aforementioned mitigation and management measures.**		
Surface Water Assessment and Storm water management (Appendix H)	<u>Storm Water Management Assessment</u> The proposed project development will alter the existing environmental state of the area (which is an old rehabilitated tailings facility with undulating terrain), thereby affecting the generation of storm water from its existing state. Volumes of storm water generated over disturbed areas are generally expected to increase because of the reduction in natural vegetation, while the quality of the storm water generated is expected to decrease (silt load). These changes are, however, expected to be primarily associated with the construction and decommissioning phases of the project. The installation of PV panels mounted on concrete secured pylons/poles results in the majority of the land surface retaining its natural land-cover once rehabilitation has occurred (during the operational phase), with only the PV foundations representing a permanent change (during the operational phase). Additional associated project infrastructure such as roads, fences, lay down areas, offices etc will also alter the 'natural' or existing hydrological flow regime.	X	

	A simple conceptual storm water management plan has been developed for the solar PV area for both the phase 2 preferred and alternate layout option. This was based upon delineated upstream contributing catchment areas being diverted (where possible) around the solar PV areas so as to reduce potential flooding and ponding of water. The conceptual storm water management plan also proposes the establishment of formalised channels to manage water generated upstream and within the proposed PV areas to be routed more effectively through the site. This will result in a more defined river channels with an associated ability to concentrate flooding, modelled on the basis of current terrain as defined by the 2m DTM. Additional flood protection berms have also been proposed for areas where flood risk is of concern, based on the model results. The phase 2 SWMP takes cognisance of the proposed SWMP for phase 1. All proposed infrastructure has been sized to effectively route up to the 1:50 year flood event. This may be a conservative approach for a solar PV plant, but it is located on a previously rehabilitated tailings facility on mining property hence the approach to design infrastructure in accordance with GN704. <u>Flood Assessment</u> In this assessment, rivers intersecting both the proposed powerline (from Phase 1) and the preferred and alternative sites (from Phase 1 and Phase 2) were selected for flood modelling. Flood modelling of relevant rivers utilised the 2m DTM and 30m DSM for the estimation of design hydrographs and the 2m DTM alone for the development of the hydraulic portion of the flood model. The availability of a continuous 2m DTM allowed for the adoption of a 2D flood model approach. Unlike a 1D approach (using cross-sections) which samples the DTM at set cross-section locations, a 2D model approach uses a continuous model grid. The advantage of a 2D model is consequently its ability to account for more variation in the topographic data since no gaps are present in the model geometry (as is the case with cross-sections). The 1:50 year and 1:100 year RI hydrographs representative of the design flows in the rivers of interest were estimated prior to the development of a hydraulic (flood) model. These hydrographs were subsequently applied to various reaches of the hydraulic model (seven inflow locations in total), which enabled the estimation of the 1:50 year and 1:100 year RI flood-lines and associated datasets for flood depth and velocity. The latest layout of PV arrays are noted as falling outside the modelled 1:100 year RI flood-line, with infrastructure (site road) just touching this flood-line. This layout assumes flood-line accuracy, however, as outlined there are limitations to this accuracy. To assist in offsetting potential flood risk to the site, two flood protection berms are proposed for infrastructure closest to areas of flooding (a 20m buffer of the flood-line informed flood protection). These flood protection berms should be at least 1m high (in relation to the adjacent landscape). If any infrastructure is to be positioned within the simulated flood-lines, it should be flood-compatible in nature (e.g. PV pylons with panels above the flooding). For flood sensitive infrastructure, an additional offset from the flood-line should be considered given the potential inaccuracies in the 2m DTM. There are two roads and a fence proposed as part of the preferred layout that intersect a non-perennial tributary of the Withokspruit, located		

	between the two preferred boundary portions. A bridge design has been provided for these roads and is included in the Appendix C of this report. No assessment of these two bridges has been considered with regards to their influence on flooding and their design is assumed to not alter the results of the flood modelling included in this report. Details of the design of this proposed infrastructure are such that they will allow for the free drainage of flows generated in this stream during flood events. Having set out the preferred layout on the basis of the modelled flood-lines, it is noted that some proposed infrastructure passes through the 1:50,000 topographical map non-perennial tributary of the Withokspruit. A site survey confirming the route of the non-perennial river should be performed given the difference between the defined river location and the modelled flooding. If necessary, flood-lines can be re-modelled using more detailed elevation data (LiDAR) to improve model confidence. <u>Hydrological Impact Assessment</u> Hydrological impacts associated with the proposed solar PV development which have been identified in this assessment include flooding, sedimentation and siltation of water courses, as well as the alteration of natural drainage patterns and associated stream flow volumes. To this end, it is recommended that the silt load in the receiving water resources immediately downstream of the site be monitored prior to construction, during construction, as well as post construction. The significance rating for the construction and operational phases for both pre and post mitigation for the alternate and preferred site options have been considered in this assessment. The storage/handling of fuel, lubricants and chemicals (where applicable) will require special attention due to their hazardous nature as is the case with the diesel and oil bay. These areas are required to be managed on impermeable floors with appropriate bunding, sumps and roofing.		
Wetland Impact Assessment and Aquatic Impact Assessment (Appendix I)	Wetland Findings A thorough ground truthing delineation exercise was conducted following the desktop Scoping Assessment for this project. Based on the four wetland indicators identified on site, three HGM units were delineated in both the preferred and alternative layout sites as well as the 500m regulated area. HGM 1 was classified as an unchannelled valley bottom system, HGM 2 is classified as a seep, HGM 3 is classified as a depression. HGM 1 flows along the western edge of the preferred layout, HGM 2 was delineated within the 500m regulated area and a portion of HGM 3 was delineated at the south-eastern boundary of the alternative layout. Apart from the three natural HGM units delineated within the study site and 500m regulated area, a number of artificial wetlands, functional dams, discarded dams, and seepage from dams were delineated. These wetland areas were identified both within phase 1 of the Ergo Gold PV project as well as during the current assessment. During both phases of the Ergo Gold PV project, these areas were confirmed to be artificial in nature and have	X	

	been created by the extensive anthropogenic modifications throughout the study site. As a result of these disturbances, the soils of the site have been completed modified and are now classified as the Hydric Technosol, Stilfontein form. These soils show signs of saturation but are not natural wetland soils. The artificial 'wetlands' were delineated during phase 1 of the Ergo Gold PV project based on the presence of hydric characteristics of the soil, at the surface of the soil profile or within the first 10cm. Similar 'wetland' areas were identified during the current assessment, within and adjacent to areas that have been extensively modified by historic and current mining activities and the subsequent rehabilitation of these areas. The three natural HGM units were assessed with regards to their health according to the Wet-Health methodology. A level 2 assessment (detailed) was conducted. HGM 1, the unchannelled valley bottom wetland, was classified as Seriously Modified (PES Category E), HGM 2, the seep system has been classified as Largely Modified (PES Category D), and HGM 3, the depression system has been classified as Moderately Modified (PES Category C). Aquatic Findings In general, valley bottom wetlands and depressional systems such as was determined to be present within the study area are unlikely to support a diverse array of aquatic biota given the lack of diverse hydraulic habitat relative to true riverine reaches of watercourses. In addition, prevailing and historic land uses are likely to present a further limiting factor to the ability of the associated watercourses to support representative taxa, with much of the intrinsic biodiversity elements being lost and only a depauperate diversity likely to the present. Further, a total of four indigenous fish species and one alien fish species are expected to be associated with the larger study area. Such diversity may however be considered optimistic, and only limited fish diversity is expected to be associated with HGM 1 (if any), while no fish species are expected HGM 3. Buffer requirements and Impacts Even though the solar panels will be situated in areas where vegetation has been maintained, in order to reduce the risks of erosion, there is additional infrastructure associated with the project. These include a BES laydown area, a warehouse, an office, a switch room, internal roads to allow access to all the panels as well as a fence which will surround the entire infrastructural area. Stormwater emanating from the developed areas can have an impact on the receiving environment and particularly the wetland systems, through the increase in sediment transportation, the increase in flow into the receiving environment and the decrease in stormwater infiltration into the soil profile. Further to this the proposed storm water management plan includes the use of drainage channels to remove excess stormwater from the Stilfontein soils where stormwater will collect during the summer season in particular. A buffer was therefore calculated taking these factors into consideration and a 21 m buffer is recommended for the protection of the natural wetland systems. It is recommended that the buffer be planted with indigenous grasses and maintained as part of the construction and		

	operational phases of the Environmental Management Programme for the development. A high basal cover of indigenous grass species will aid in the buffering out of sediment and pollutants from the development before stormwater enters into any of the wetland systems. Furthermore, stormwater control from the development is key in reducing impacts to the downstream and adjacent wetland systems. It must be noted that there are some small areas in which the solar panels will encroach into the 21 m buffer but not into the wetland system. The outfall from the storm water drainage channels is located within the wetland system (HGM 1). Furthermore, a bridge is proposed to cross HGM 1 in order to gain access to both portions (Ptn 272 and Ptn 183 of the Farm Witpoortje No. 117R) of the preferred layout site. The activities for both the preferred and alternative layout identified within the study site include: • The clearing of portions of the PV facility site for the establishment of the solar panels, and associated infrastructure. • The construction of the bridge over HGM 1. • The construction of the storm water drains. • Maintenance of the PV facility during the operational phase. Negative impacts therefore associated with this project potentially include: • Soil erosion and sedimentation of the wetland systems. • Pollution potential. • Encroachment of invasive alien species into the wetlands as a result of the additional disturbances to the area caused by the construction and operational phases of the project. Several general and specific measures are proposed to mitigate these impacts. The Risk Assessment for the proposed project was undertaken in accordance with the General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) for Water Uses as defined in Section 21 (c) and (i) (Notice 509 of 2016). From a wetland and aquatic perspective, impact scores (for both the preferred and alternative layouts) received are both Low and Moderate. This is due to the PV facility site being located on a site completed disturbed from historic mining operations. Impacts to the wetland systems range from being small and easily mitigable to requiring mitigation measures on a higher level with associated costs		
Soils, land capability and agricultural	Soils were classified to form level and assessed in terms of their field texture, soil depth, subsoil permeability, slope, rockiness, surface crusting and wetness.	X	

potential assessment (Appendix J)	Taking into account the findings of the soil mapping exercise for both phase 1 and phase 2 of the Ergo Gold PV project, coupled with historic and current aerial imagery, the study site was divided into two separate soil types, the Natural Soils and the Anthrosols and Technosols. The first group are naturally occurring with the soil morphological expression and sequence of soil horizons being formed without significant human intervention. Anthrosols and Technosols on the other hand, are soils which have been drastically altered by human intervention such that the natural soil properties are no longer identifiable, and an anthropogenic classification is applied. The natural soils were classified as the Hutton/Nkonkoni soils, as well as the Katspruit and Tukulu soil forms. The Anthrosols and Technosols were classified as the Grabouw, Witbank, and Stilfontein soils forms. Utilising the soil information, climatic information, and topography, the study site was assessed in terms of the agricultural potential. The study site has been categorised into the Class III, Class V, Class VI, and Class VIII categories. The Class III category is classified in areas that contain the natural Hutton/Nkonkoni soils. These soils are productive with regards to crop cultivation as they are well drained, generally rich in minerals and nutrients and have the depth required to sustain a number of crops. These soils occupy 22.2 % of the preferred layout site, and 5.7 % of the alternative layout site. The Class V category is reserved for saturated soils and was thus mapped where the anthropogenic Stilfontein and the natural Katspruit and Tukulu soils were identified in both the preferred and alternative layout sites. The soils are either anthropogenically modified, in the case of the Stilfontein soils or form part of wetland systems in the case of the Katspruit and Tukulu soil forms. Cropping in these areas would require intensive protection measures and special practices such as the drainage of the soil. Class V areas occupy 31.7 % of the preferred layout site and 22.9 % of the alternative layout site The Grabouw or Physically Disturbed Anthrosol soils have been classified as Class VI soils. Class VI soils have severe restrictions to cropping and are therefore excluded from production under perennial vegetation. This is due to the anthropogenic disturbances to these soils and the use of the soils for human activity. Class VI areas occupy 40.8 % of the preferred layout site and 49.2 % of the alternative layout site. The remaining Witbank soils are categorised as Class VIII soils. These soils have been completely modified and are currently stockpiles. They are not productive for any agricultural activities, and they occupy 5.7 % of the preferred layout site 22.1 % of the alternative layout site. Overall, the study site can therefore be considered to have a low agricultural potential with severe limitations to crop cultivation. The majority of the site is classified as Class V or Class VI (76.8%). This is as a result of a combination of factors including the significant long term anthropogenic modifications to the soils of the entire study site, the presence of saturated horizons, and the use of the surrounding landscape for mining and urban activities. Portions of the site are considered acceptable for crop production; however, these are small in comparison (22.2 %) to the non-suitable areas (77.8 %). The project will involve the clearing of portions of the site for the establishment of the proposed 40MW power PV facility. The alternative layout is similar to the preferred layout, with Potion 183 of the Farm Witpoortje No. 117R forming both a part of the preferred and alternative layouts. Similar		

	soils were identified in the Remainder of Portion 9 of the Farm Withok No. 131IR as in the preferred layout site. As such impacts to the agricultural potential of the study site were identified as being the same for both layouts (preferred and alternative) and are associated with • the loss of agricultural land (this is a very limited to non-applicable impact as it only pertains to the loss of grazing land). • soil compaction and exposure of topsoil potentially leading to erosion, and • pollution of the soils as a result of construction related activities.		
Heritage Impact Assessment (Appendix K)	Key findings of the assessment include: • The study area is characterised by cultivation and mining activities from the 1940's onwards with various features relating to the built environment occurring in the area, that is older than 60 years, and therefore protected by Heritage Legislation. Additionally historical material was recorded that washed out of reclaimed slimes dams; • In addition, previous assessments in the area recorded Stone Age sites concurring with Stone age scatters recorded in this assessment. • Based on the SAHRA paleontological sensitivity map the study area is indicated as of insignificant, low, moderate and high sensitivity and an independent study was conducted for this aspect. Bamford (2022) concluded that the project can continue and that a Fossil Chance Find Protocol should be added to the Environmental Management Programme (EMPr). • Both the Preferred and Alternative lay out are acceptable from a heritage point of view provided that the recommendations in this report are adhered to. The impact on heritage resources can be mitigated to an acceptable level and the project can be authorised provided that the recommendations in this report are adhered to and based on the South African Heritage Resource Authority (SAHRA) 's approval.	X	
Palaeontological Impact Assessment (Appendix L)	Most of both the northeast and the southwest sites are on very highly sensitive rocks of the Vryheid Formation and a site visit would normally be required BUT, The Palaeontological Impact Assessment (Appendix L) notes that the area is covered in vegetation that has been established on the rehabilitated mine dumps, or on the dumps (southern part of the southwest site). Thus the project footprints are on highly disturbed land. A site visit before new ground is broken would be a waste of time as there would be no fossils on the land surface.	X	
Visual Assessment (Appendix M)	The construction and operation of the proposed 40MW SEF and its associated infrastructure, may have a visual impact on the study area, especially within (but potentially not restricted to) a 1km radius of the proposed facility. The visual impact will differ amongst places, depending on the distance from the facility.	X	

	The proposed development site for the PV plant is located on mining land within relatively close proximity to existing mining infrastructure, activities and other visual disturbances. The PV plant will primarily be visible to residents of the small holdings surrounding the proposed development site, or by observers travelling along local roads. The greater environment surrounding the site is not considered to have a high visual quality or specific sense of place due to the relatively disturbed, altered and developed nature of the study area. The visual impacts associated with the PV plant is therefore considered to be within acceptable limits and do not constitute an irreplaceable loss of visual resources. The Preferred Layout PV plant has a greater potential to consolidate the visual impact, due to the close proximity of the two sites to each other (approved phase 1 20MW PV plant and proposed 40MW PV plant), and to the ERGO Mining infrastructure. It also has a reduced area of visual impact when compared with the Alternate Layout (Phase 2 Area A1 and Phase 2 Area C). The Preferred Layout (Phase 2 Area A1 and Phase 2 Area B) PV plant is therefore the preferred alternative from a visual impact assessment point of view. Note: Since the submission of the Visual report (Appendix M), the Preferred Layout has been optimised, changing the layout to a very limited extent. See Figure 82 below. The change in the layout will have an insignificant influence on the visual exposure of the proposed facility and is not expected to influence the outcome of the VIA as it is presented in this report.		

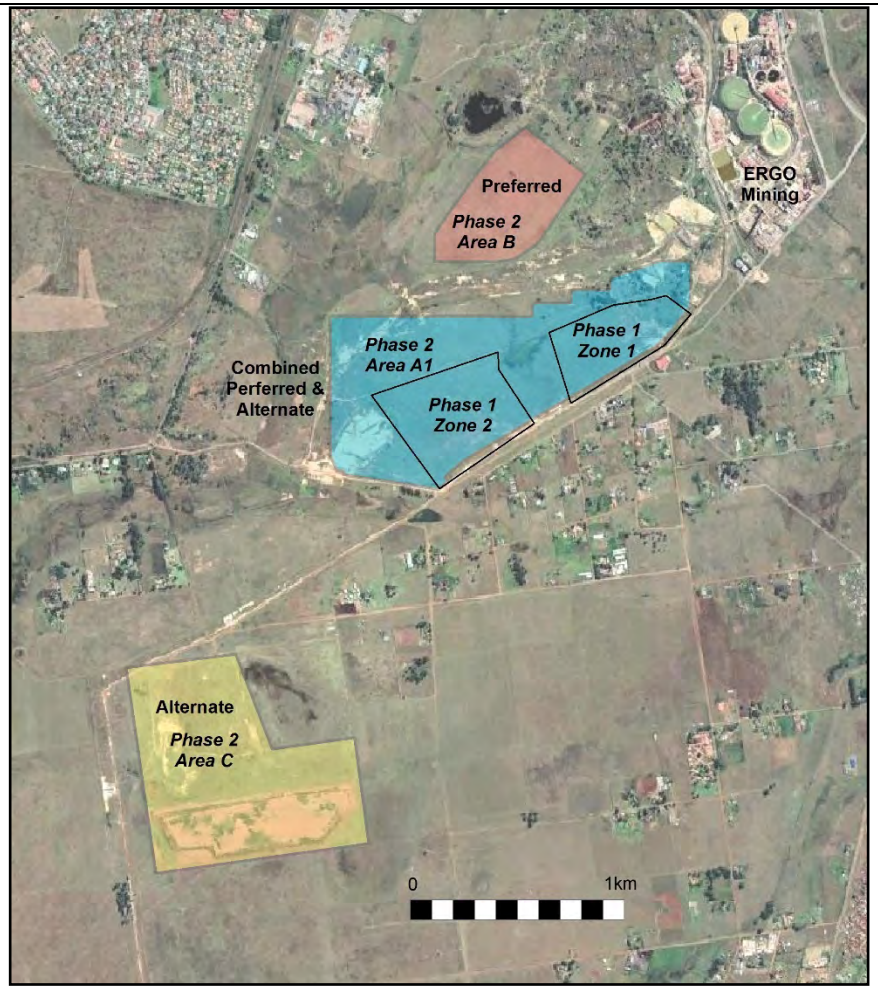


Figure 82: Aerial view of the proposed optimised site layout.

	Overall, the post mitigation significance of the visual impacts is expected to range from moderate to low. An additional mitigating factor for the proposed SEF is the fact that the facility utilises a renewable source of energy (considered as an international priority) to generate electricity and is therefore generally perceived in a more favourable light. The SEF does not emit any harmful by-products or pollutants and is therefore not negatively associated with possible health risks to observers. A number of mitigation measures have been proposed in the Visual Impact Assessment. Regardless of whether or not mitigation measures will reduce the significance of the anticipated visual impacts, they are considered to be good practice and should all be implemented and maintained throughout the construction, operation and decommissioning phases of the proposed facility. If mitigation is undertaken as recommended, it is concluded that the significance of most of the anticipated visual impacts will remain at or be managed to acceptable levels. As such, the SEF and associated infrastructure would be considered to be acceptable from a visual impact perspective and can therefore be authorised.		
Socio-economic Assessment (Appendix N)	The potential socio-economic impacts range from direct changes to the sense of place and livelihoods of local residents, to the direct and indirect opportunities for employment and economic development. The significance of socio-economic on the communities immediately surrounding the proposed project PV facility site are anticipated to be moderate to low with mitigation. The proposed project is, however, anticipated to change the nature of the area. The proposed sites currently comprise open veld. This area is used by people moving between residential and industrial areas nearby, and on an ad hoc basis by subsistence and small-scale livestock farmers. The open sites also provide a pleasant aesthetic environment (although modified) for the local residents in Withok Estates AH, as the open veld provides uninterrupted views in an otherwise urban landscape. The scale and nature of the proposed project is unlikely to significantly alter the broader socio-economic environment, although benefits through employment and economic development and growth in the renewable energy sector could provide positive impacts. There is the potential for local subsistence livestock farmers is to be impacted, but there is a larger area that can be accessed informally for grazing. The impact on the local residents in Withok Estates AH, especially through the long-term aesthetic, nuisance and safety impacts could alter the nature of the area and sense of place, and even potentially the businesses operating in the area. It is anticipated that recommended mitigation measures will reduce most of the potential socio-economic impacts, but some residual impacts are still likely to occur. However, the design of the PV facility will need to minimise visual and noise impacts on local residents. The following key mitigation is recommended to manage the direct and indirect impacts of the proposed project:	X	

	• Design the facility to minimise visual impacts (as per the visual impact assessment (Du Plessis, 2021)) including vegetation screens, use of appropriate colour (Using colour/paint on infrastructure so that it blends in with the landscape (e.g. greens and browns on large flat buildings or structures), and low-impact lighting. • Maintain access roads and prevent dust emissions and use of public roads. • Communication Plan – to engage with community, communicate the design and activities associated with the project, especially for the PV site. • Complaints Procedure – to ensure communities and stakeholders have access to a means of reporting issues and complaints to the operator.		
Traffic Impact Assessment (Appendix O)	The proposed development should be considered favourably from a traffic engineering point of view.	X	

I. Environmental Impact Statement

i. Summary of the key findings of the EIA

The summary includes the key findings and impact statements from the specialists:

Flora Terrestrial biodiversity: Due to the largely modified and secondary nature of the vegetation, the proposed development will have limited to no impact on sensitive vegetation. However, moist grassland areas should be protected as it is associated with wetland conditions and could include plant species of conservation concern. (Appendix E).

Fauna Terrestrial biodiversity: In terms of terrestrial fauna biodiversity, no additional faunal assessments or studies are deemed necessary. There is no reason for not authorising the activity as long as the recommendations and mitigation measures as per the fauna study are adhered to (Appendix F).

Avifauna: In accordance with the outcomes of the avifauna impact assessment, in conjunction with the baseline conditions and the impact management measures, the proposed 40MW SEF is not deemed to present unmitigable negative environmental issues or impacts. (Appendix G).

Surface Water Assessment: Hydrological impacts associated with the proposed solar PV development which have been identified in this assessment include flooding, sedimentation and siltation of water courses, as well as the alteration of natural drainage patterns and associated stream flow volumes. To this end, it is recommended that the silt load in the receiving water resources immediately downstream of the site be monitored prior to construction, during construction, as well as post construction. The significance rating for the construction and operational phases for both pre and post mitigation for the alternate and preferred site options have been considered in the specialist assessment and suitable recommendations are made which result in moderate to low impacts with proposed mitigation measures (Appendix H).

Wetland Impact Assessment and Aquatic: From a wetland perspective, the specialist is of the opinion that impacts arising from the proposed project can be mitigated to an acceptably low level. This is attributed to the historically and currently disturbed nature of the area coupled with the modified to seriously modified nature of the wetlands assessed within the study site. Even though there will be some encroachment of the solar panels into the 21m buffer, this impact is expected to be low and the storm water flow from these sites into the HGM 1 can be effectively managed. Furthermore, impacts regarding the bridge and storm water drains can also be effectively managed.

In consideration of the aquatic habitat availability within the study area, it is expected that the aquatic biota assemblages present will be dominated by taxa with a strong preference for instream and emergent vegetation within very slow-flowing habitats, as well as taxa with a very low to low preference for unmodified water quality. Further, given the likely seasonal availability of water within the unchannelled and depressional wetland systems present, it is expected that the period of inundation of the watercourse will result in temporal variations of aquatic assemblages within these systems. As such the risk of impact from the proposed activity on the associated aquatic ecosystem is expected to be low.

It is therefore the opinion of both authors that either the preferred or alternative layouts be approved from a wetland and aquatic perspective (Appendix I).

Soils, land capability and agricultural potential: The study site was divided into two separate soil types, the Natural Soils and the Anthrosols and Technosols.

The site (including both layout alternatives) can be considered to have a negligible to low agricultural production with regards to cultivation of crops as a result of the majority of the site (including both layout alternatives) having been anthropogenically disturbed to such a level that the natural soil profile is not generally apparent. Cultivation of crops cannot take place in these

areas. It is therefore the opinion of the author that, provided mitigation measures to reduce the impact of the project on the receiving environment are implemented as part of the construction and operational phases of the project, either the preferred or alternative layouts be approved from an agricultural perspective. (Appendix J).

Heritage: The impact on heritage resources can be mitigated to an acceptable level and the project can be authorised provided that the recommendations in the specialist report are adhered to and based on the South African Heritage Resource Authority (SAHRA) 's approval (Appendix K).

Palaeontological: The impact on the palaeontological heritage would be low so the project should be authorised. As far as the palaeontology is concerned, there is no preference for the site of the photovoltaic collectors. (Appendix L).

Visual: The anticipated visual impacts identified (i.e. post mitigation impacts) range from moderate to low significance. Anticipated visual impacts on sensitive visual receptors (if and where present) in close proximity to the proposed facility are not considered to be fatal flaws for the proposed PV facility. Considering all factors, it is recommended that the development of the facility as proposed be supported; subject to the implementation of the recommended mitigation measures and management programme (Appendix M).

Socio-economic: It is the opinion of the specialist that the proposed project should be authorised within the context of the socio-economic assessment, as the proposed project is anticipated to be of economic benefit for the local area, as well as contributing to regional renewable energy development opportunities.

The employment opportunities and the multiplier effect could improve the opportunities for currently unemployed individuals and low-income households on a local and regional level. However, the manner in which the operations are carried out, must be done in line with best practice and consideration for socio-economic impacts. It is possible that not every eventuality of the potential socio-economic impacts have been detailed by this study, due to the complexity of socio-economic environment. It is, therefore, crucial that ongoing and transparent engagement, and management of issues as they arise, is carried out through the recommendations of this study. This is likely to ensure that the Withok Estates AH and other stakeholders remain in support of the proposed project and future developments, and that negative impacts on the local community are minimised and benefits are maximised (Appendix N).

Traffic: The zoning for the proposed development is mining with a proposed Special Consent: "Renewable Energy Structure". It is expected that the proposed Phase 2 of the development will generate 21 peak hour trips during the AM and PM peak hours in the construction phase and Phase 1 & 2 of the proposed development will generate 7 peak hour trips during the operational phase. Access to the development during the construction phase is proposed from the private mine access road from 17th Road. Access to the proposed development during the operational phase is proposed from Denne Road / Koot Street. There are existing public transport facilities located at a nearby shopping centre. The impact of the expected trip generation of the proposed development for the construction and operatial operational stage is negligible. (refer to Appendix O).

EAP Summary: The proposed 40MW Ergo Solar Energy Facility is seen to have a LOW to HIGH impact on the receiving environment and LOW to MODERATE if mitigation measures are implemented. Cumulative Impacts could lead to higher impact levels, however significance rating remains at a LOW for cumulative impacts with the implementation of all mitigation measures presented be followed as well as good practice guidelines and community engagement, these impacts could be mitigated to acceptable levels. Based on an understanding of the proposed solar PV project, the impact assessment and sensitivity of the affected environment, EMA is confident that the significance of anticipated impacts can be mitigated to an

acceptable level. EMA is therefore of the opinion that the proposed 40MW Ergo Solar Energy Facility, and associated infrastructure should be authorised, conditional on the implementation of the mitigations and monitoring measures contained in the EMPr.

ii. Final site map

The final preferred site layout is presented in Figure 83 (Refer to Appendix C).

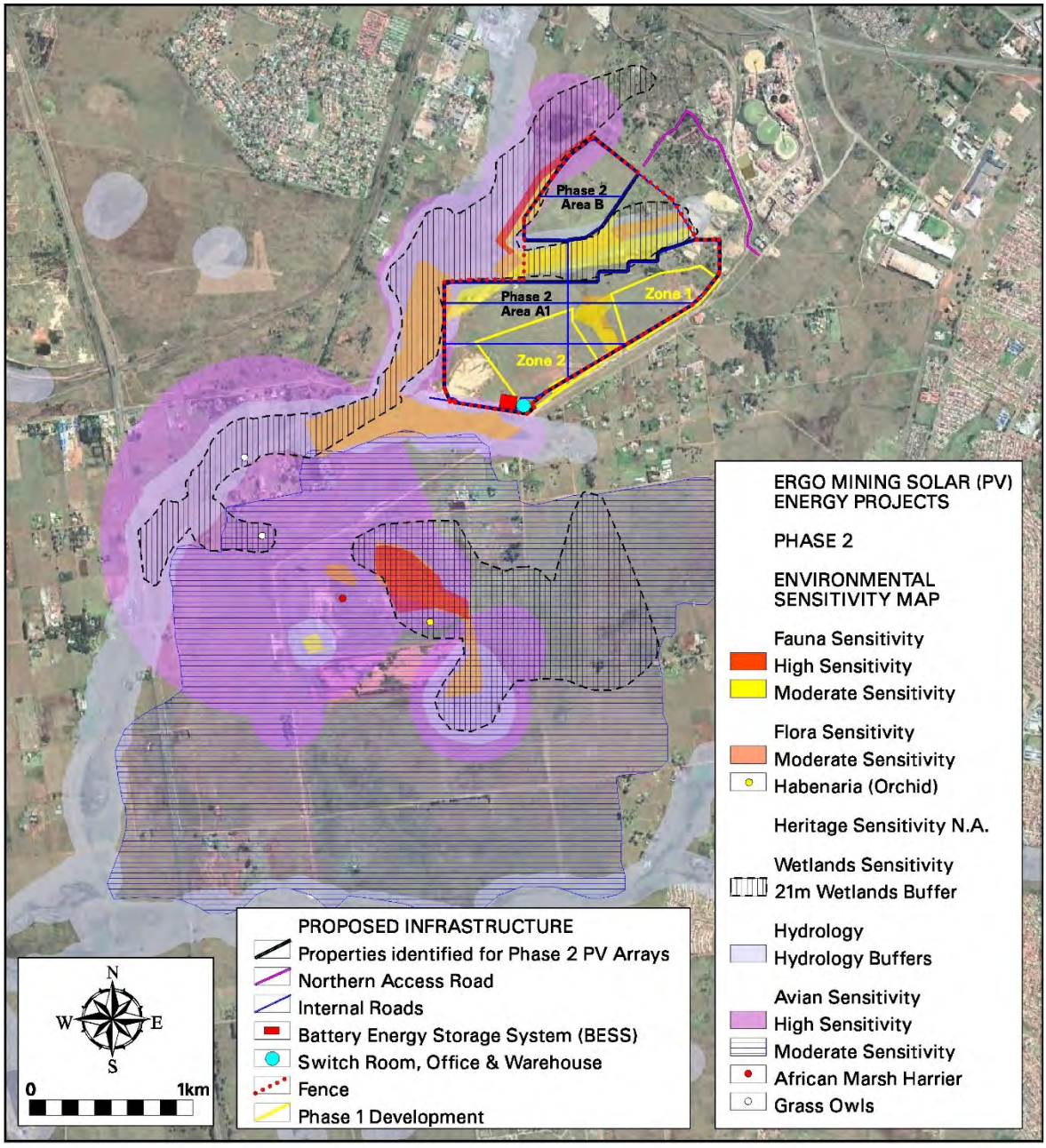


Figure 83: Final site map indicating site sensitivity

iii. Summary of the positive and negative implications and risks of the proposed activity and identified alternatives

Table 83: Summary of the positive and negative implications

Identified Impact	Significance	
	Pre Mitigation	Post Mitigation
Destruction of natural vegetation of medium sensitivity (moist grasslands)	Moderate (-ve)	Low (-ve)
Destruction of modified vegetation of low sensitivity	Moderate (-ve)	Low (-ve)
Exposure to erosion and subsequent sedimentation or pollution of proximate moist grassland	Moderate (-ve)	Low (-ve)
Removal / Destruction of protected plants and plants of conservation concern	Moderate (-ve)	Low (-ve)
Potential increase in invasive vegetation	Moderate (-ve)	Low (-ve)
Compaction and destruction of soils	Moderate (-ve)	Low (-ve)
Potential destruction of sensitive fauna habitat (Construction)	Moderate (-ve)	Low (-ve)
Potential destruction of sensitive fauna habitat (Operation)	Low (-ve)	Low (-ve)
Hindrance, trapping, killing of fauna, focussing on potential TOP species in the project area (Construction)	Moderate (-ve)	Low (-ve)
Hindrance, trapping, killing of fauna, focussing on potential TOP species in the project area (Operation)	Low (-ve)	Low (-ve)
Contamination of fauna environment (Construction)	Moderate (-ve)	Low (-ve)
Contamination of fauna environment (Operation)	Low (-ve)	Low (-ve)
Assessment of the habitat loss and/or transformation caused by the construction of the 40MW SEF	Low (-ve)	Low (-ve)
Assessment of the disturbance impact caused by the construction of the 40MW SEF	Low (-ve)	Low (-ve)
Assessment of mortality due to collision with the PV panels	Moderate (-ve)	Low (-ve)
Assessment of habitat impacts associated with altered run-off and chemical pollution	Low (-ve)	Low (-ve)
Impact Assessment: Flooding	Moderate (-ve)	Low (-ve)
Impact assessment: Sedimentation and siltation of water courses	Moderate (-ve)	Low (-ve)
Impact assessment: Alteration of natural drainage patterns	Moderate (-ve)	Moderate (-ve)
Soil erosion and sedimentation of wetland systems (Construction Phase)	High (-ve)	Moderate (-ve)
Pollution of wetland systems (Construction Phase)	High (-ve)	Low (-ve)

Encroachment of alien invasive vegetation (Construction Phase)	Moderate (-ve)	Low (-ve)
Construction of bridge across HGM 1	Moderate (-ve)	Low (-ve)
Construction of drainage channels for the stormwater management of the area	Moderate (-ve)	Low (-ve)
Soil erosion and sedimentation of wetland systems (Operational Phase)	Moderate (-ve)	Low (-ve)
Pollution of wetland systems (Operational Phase)	Moderate (-ve)	Low (-ve)
Encroachment of alien invasive vegetation (Operational Phase)	Moderate (-ve)	Low (-ve)
Existence of bridge across HGM 1	Moderate (-ve)	Low (-ve)
Operation of drainage channels for the stormwater management of the area	Moderate (-ve)	Low (-ve)
Loss of agricultural productive land within the study area: Construction Phase	Low (-ve)	Low (-ve)
Soil Compaction leading to erosion and sedimentation (Construction Phase)	Moderate (-ve)	Low (-ve)
Soil Pollution (Construction Phase)	Moderate (-ve)	Low (-ve)
Soil Compaction leading to erosion and sedimentation (Operational Phase)	Moderate (-ve)	Low (-ve)
Soil Pollution (Operational Phase)	Moderate (-ve)	Low (-ve)
Construction and Operation of PV Plant	Moderate (-ve)	Low (-ve)
Palaeontological Impact Assessment (Construction)	Low (-ve)	Low (-ve)
Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed PV facility	Moderate (-ve)	Moderate (-ve)
Visual impact on observers in close proximity to the proposed PV plant structures.	High (-ve)	Moderate (-ve)
Visual impact of the proposed PV facility structures within the region.	Moderate (-ve)	Moderate (-ve)
Impact table summarising the significance of visual impact of lighting at night on visual receptors in close proximity to the proposed PV facility.	Moderate (-ve)	Low (-ve)
Impact table summarising the significance of the visual impact of solar glint and glare as a visual distraction and possible air travel hazard.	Low (-ve)	N/A
Visual impact of the ancillary infrastructure.	Low (-ve)	Low (-ve)
The potential impact on the sense of place of the region.	Low (-ve)	Low (-ve)
The Increased Employment Opportunities (Construction)	Very Low *Positive*	Low *Positive*
Increased Local Economic Development Opportunities (Construction)	Very Low	Low

	Positive	*Positive*
Reduced Public Safety (Construction)	Moderate (-ve)	Low (-ve)
Increased Nuisance, Disruption and Indirect Costs (Construction)	Moderate (-ve)	Low (-ve)
Reduced access to livelihood resources (Construction)	Low (-ve)	Low (-ve)
Increased Employment Opportunities (Operation)	Very Low *Positive*	Low *Positive*
Increased local economic stimulation opportunities (Operation)	Very Low *Positive*	Low *Positive*
Increased Nuisance, Disruption and Indirect Costs (Operation)	Moderate (-ve)	Low (-ve)
Reduced public safety and security (Operation)	Moderate (-ve)	Low (-ve)
Loss of permanent jobs (Decommissioning)	Moderate (-ve)	Low (-ve)
Loss of local economic opportunities (Decommissioning)	Moderate (-ve)	Low (-ve)
Increased temporary employment (Decommissioning)	Insignificant (Positive)	Very Low (Positive)
Loss of Local Economic Development Potential (No-Development Alternative)	Moderate (-ve)	N/A
Loss of Employment opportunities	Low (-ve)	N/A
Assessment of Environmental Impact of Transport Activities during Construction	Low (-ve)	Low (-ve)
Assessment of Environmental Impact of Transport Activities during Operational Phase	Low (-ve)	Low (-ve)

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m. Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr

(Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.)

Part B of this report provides the proposed EMPr. The purpose of the EMPr is to achieve a required end state and describes how activities that have, or could have, an adverse impact on the environment will be mitigated, controlled and monitored. It also addresses the environmental impacts during the Construction, Operational, Decommissioning and Post-Closure Phases of the proposed activities.

The main focus of the EMPr is environmental protection throughout the life cycle of the proposed PV project. A number of environmental recommendations are therefore made to achieve environmental protection.

The environmental and social objectives are set to allow the development of the proposed 40MW PV SEF and associated infrastructure in an environmental and socially responsible fashion while ensuring that sustainable closure can be achieved. To achieve closure the correct decisions need to be taken during the planning phase.

The following Environmental Objectives and goals formed the baseline for the development of the EMPr in Part B of this report:

- Protect the biophysical environment from any impacts that cannot be mitigated and that will negatively impact on biodiversity on a regional scale;
- Reserve the water resources in line with the objectives of the integrated catchment management and thereby ensure that the limited available resources are utilised to the maximum benefit of the country and its inhabitants;
- Ensure that activities are carried out so as to aid rehabilitation;
- Ensure a safe and healthy environment for people to live in as is stipulated in the constitution; and
- Ensuring compliance to legislation, regulations, and national standards throughout the life cycle of the project.

The following socio–economic objectives should be attained during the entire life cycle of the proposed activities:

- Adhere to an open and transparent communication procedure with stakeholders at all times.
- Ensure that accurate and regular information is communicated to I&APs in a manner which is understandable and accessible.
- Mitigate negative impacts.
- Enhance Project benefits and minimise negative impacts through intensive consultation with stakeholders.
- Assemble adequate, accurate, appropriate, and relevant socio-economic information relating to the context of the operation.
- Ensure that recruitment strategies for the PV facility, prioritise the sourcing of local labour, and share in gender equality.
- Ensure an atmosphere of equality and non-discrimination among the workforce.
- Contribute to the development of functional literacy and numeracy among employees.
- Empower the workforce to develop skills that will equip them to obtain employment in other sectors of the economy.
- Contribute to the development of a self-reliant (not dependent on the PV facility or Ergo Mining) community surrounding the area of operation.
- Ensure that decommissioning and retrenchments take place in a legally compliant and humane manner.

The overall rehabilitation objectives for this project are as follows:

- Maintain and minimise impacts to the ecosystem within the project area.
- Re-establishment of the pre-development land capability to allow for a desirable post PV land use.
- Prevent excessive losses of soil resources, including soil seed banks, by adequately managing stormwater and accelerated erosion.

- Prevent soil, surface water and groundwater contamination.
- Comply with the relevant local and national regulatory requirements.
- Maintain and monitor the rehabilitated areas until they have reached a stable state in which a gradual natural succession to an optimal natural species composition can progress.

n. Final proposed alternatives

(Provide an explanation for the final layout of the infrastructure and activities on the overall site as shown on the final site map together with the reasons why they are the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment)

Two property alternatives were considered during the impact assessment (see section g) of the report detailing the assessment motivation. Figure 1 presents the preferred alternative compared with the layout alternative as presented during the scoping phase. Property alternativess summarised below:

- Property alternatives:
  - Preferred Layout Area
    - Farm Witpoortje 117 IR Portion 183[15] (Referred to as Area A1) and
    - Farm Witpoortje 117 IR Portion 272 (Referred to as Area B)
  - Alternate Layout Area
    - Farm Witpoortje 117 IR Portion 183 (Referred to as Area A1) and
    - Farm Withok 131 IR Portion 9.

o. Aspects for inclusion as conditions of Authorisation

(Any aspects which have not formed part of the EMPr that must be made conditions of the Environmental Authorisation)

Please refer to Section Q)ii) for the main mitigation measures that should be included as conditions in the authorisation.

p. Description of any assumptions, uncertainties, and gaps in knowledge

(Which relate to the assessment and mitigation measures proposed)

Specialist studies are conducted to certain levels of confidence, and in all instances known and accepted methodologies have been used and confidence levels are generally high. This means that in most cases the situation described in the report is accurate at high certainty levels, but there exists a low probability that some aspects have not been identified / captured during the studies. Such situations cannot be avoided simply due to the nature of field work.

- Flora Specialist

[15] Farm Witpoortje 117 IR Portion 183 common for both the preferred and alternate layout areas.

The following limitations are applicable; however, none was considered a fatal flaw:

- Due to project time frames outside of the specialists' control, the field survey took place on the 30th of May 2022, when grasses were already dry and forbs dormant. However, the areas sampled were found to be modified and thus the late season assessment of these areas was not considered a fatal flaw.
- The specialist also undertook a site visit on the 8th of February 2021, and the 26th of March 2021 for Phase 1 of the project. The plant species data of Phase 1 was consulted for this report. The area was thus sampled thrice.
- During the May 2022 site visit, illegal miners were encountered on the most north-eastern section of the site, and therefore that area was not further sampled. However, the area was degraded and in a secondary state.

– Fauna Specialist

- Specialist studies are conducted to certain levels of confidence, and in all instances known and accepted methodologies have been used and confidence levels are generally high. This means that in most cases the situation described in the report is accurate at high certainty levels, but there exists a low probability that some aspects have not been identified / captured during the studies. Such situations cannot be avoided simply due to the nature of field work.
- The proposed access road has been assessed on a desktop level as a compliance statement from photographs. Considering the road is proposed along existing mine roads, gravel roads and along tracks within disturbed areas (natural grasslands have been disturbed by grazing and bailing), this is considered adequate.
- Habitat units identified in this report are approximations extrapolated from Google Earth satellite imagery. It must be kept in mind that changes between habitat units are gradual with transitional zones rather than hard edges.
- The animal species guidelines (SANBI, 2020) requires assessment of potential areas of influence. Although visual assessment is completed of neighbouring open space areas, this reports does explore larger areas of influence where relevant (for example downstream and catchment level impacts to potential fauna habitats and ecological corridors, or the migration / dispersion pathways of animals from conservation areas). Working with various fauna means the area of influence varies, but the discussion within this report is deemed to more than adequately address the areas of potential influence, although they are not necessarily mapped.
- The Animal Species Guidelines (SANBI, 2020) only requires the assessment of SCCs (largely IUCN species), which excludes many of our nationally protected and Red-listed species. This report therefore also includes a synopsis of other potential TOP species that may be relevant to site based on citizen science databases, distribution data and broader habitat requirements.
- The animal species protocols require academic-level information on species population demographics which is not possible with mobile animals that are startled by, and run away from, observers. Where such information is readily available, or can be collected during field surveys, this will be done in accordance with the protocols.
- It must be stressed that the survey area is a much smaller area within the larger QDGS areas utilised for desktop species, and species presented in these databases may not have been recorded at the specific site.
- Larger herbivores have not been fully evaluated within this report as these species are actively fenced in and managed within selected areas. Where they are historically recorded TOP species they are included in the relevant tables, but are not further discussed at length. This is further extended to large carnivore predators of such species (e.g. Lion and Cheetah). Rhinos and elephants are completely excluded due to sensitivity of

information. As these species are largely restricted to reserves and farms this is not seen as a significant omission.

- Some species are confirmed through signs rather than actual sightings. This is not always ideal as the age of the signs are not always known and many species have similar scat / tracks / marks on the environment and species cannot always be fully determined. The more signs the more confidence in the identification of the animal. This limitation must be kept in mind where species are discussed based on signs.
- There are inherent errors in mapping programmes which must be considered with all mapping information presented.
- Citizen Science projects were used for animal (ADU) baseline data. When utilising data from Citizen Science projects, the following must be kept in mind:
    - Public interest in sites may be fickle, and may wane and increase, which could have a direct effect on the number of records available and therefore the number of species recorded.
    - Populated areas or popular tourist destinations may have more participants and therefore higher biodiversity data than less populated areas.
    - Misidentification of species by the public cannot be excluded, but is not seen as a major problem as this is likely to be a consistent issue from year to year, and a degree of vetting does take place.
    - It must also be considered that animals observed in captivity may be recorded by citizens. Such animals should not be considered part of the natural biodiversity but as the data provided by citizen science sites do not make such distinctions, it cannot be separated from the biodiversity data presented in this report.
- Due to the low resolution of some distribution maps and the mobility of animals, distribution data utilised to present animal lists are not 100% accurate. Proper distribution data for the TOP invertebrates is scant and it is difficult to conclusively state if every species does or does not occur in the area.

– Avifauna

- The avifaunal specialist assumed that the sources of information used for this assessment are reliable. However, it must be noted that there are limiting factors and these may potentially detract from the accuracy of the predicted results.
- The report is the result of a short-term study and is based on a two site surveys of the PAOI. No long-term, seasonal monitoring was conducted by the avifaunal specialist. This assessment relies upon secondary data sources with regards to bird occurrence and abundance such as the SABAP2 and IBA projects. These comprehensive datasets provide a valuable baseline against which any changes in species presence, abundance, and distribution can be monitored. However, primary information on bird habitat and avifaunal species occurrence collected during the site visit and together with professional judgement, based on extensive field experience since 2006, was used directly in determining which species of conservation importance are likely to occur within suitable avifaunal habitat types within the PAOI. Based on these findings, the specialist was able to identify and assess the anticipated impacts and provide recommendations for mitigation;
- The site survey of the proposed 40MW SEF and the resultant observations were made in the austral summer and austral autumn seasons respectively, during which time various species may not have been present in the PAOI and therefore may not be a true indication of all bird species potentially present in the area;

- The focus of this assessment is primarily on the potential impacts on regional SCC and non-SCC SEF sensitive species i.e., species that are vulnerable to the displacement and collision impacts associated with the construction and operation of the 40MW SEF; and
- Predictions in this study are based on experience of these and similar species in different parts of South Africa, through the authors' experience working in the avifaunal specialist field since 2006. However, bird behaviour can't be reduced to formulas that will hold true under all circumstances. It must also be noted that, it is often not possible to entirely eliminate the risk of the disturbance and displacement impacts associated with the construction and operational activities. Our best possible efforts can probably not ensure zero impact on birds. Assessments such as this attempt to minimise the risk as far as possible, and although the displacement impacts, associated with the construction and operation of the 40MW SEF, will be unavoidable, they are likely to be temporary and of low significance.
- The above limitations need to be stated as part of this assessment so that the reader fully understands the complexities. However, they do not detract from the confidence that this author has in the findings of this impact assessment report and subsequent recommendations for this project.

– Hydrology

Various assumptions were required in the development of the hydraulic model with resultant limitations in the accuracy of the modelled flooding. They included the following:

- Rainfall depth – DRESSA rainfall depths are assumed accurate, with normal DRESSA values applied to this study. DRESSA also includes upper values representative of upper confidence limits.
- Design hydrographs – the hydrographs estimated using PCSWMM are assumed accurate despite the potential for large deviations in their estimation to significantly influence resulting flooding.
- Accuracy of terrain datasets – the 2m DTM and 30m DSM are assumed accurate. For the hydrological estimates, terrain accuracy is less relevant. The hydraulic model accuracy is directly related to the accuracy of the terrain as represented in the 2m DTM. A vertical accuracy of 0.5m and a cell size of 2m, means that the accuracy of the flood model is considered moderate. Filtering of the original 2m DSM, to derive the subsequent 2m DTM, will have introduced further possible inaccuracy given the smoothing out the DTM, to computationally derive the 'bare earth' surface. Improved accuracy would be possible through site survey involving river transects and survey of hydraulic structures and/or through the flying of a Lidar survey.
- Potential error in the parameterisation of the model – this included the soils and land-cover classification used which may not accurately represent the site and surrounding area.
- Mesh detail – the default mesh utilised a 50m mesh size, reduced to 10m over areas with LiDAR. While one of HEC-RAS's major strengths is the use of a subgrid, the obstructing or routing influence of linear features that are smaller than the mesh resolution will not be well defined.
- Breaklines – To compensate for mesh detail, linear features (and ridges in particular) were digitised as breaklines and then applied to the model mesh. The application of these breaklines is assumed correct.
- Roughness values – the absence of depth varying roughness in HEC-RAS as this time meant that a pseudo approach to surface roughness needed to be adopted. There are consequently limitations to this approach as depths of flooding do vary during flooding with surface roughness likewise varying (according to depth).
- Model calibration – no calibration of the model was undertaken as there is no observed data for calibration purposes.

- Software Performance - The software and methods utilised are assumed accurate with regards to their utilisation of input data and the processes they simulate.

– Wetland and Aquatic

It is difficult to apply pure scientific methods within a natural environment without limitations or assumptions. The following apply to the aquatic study:

- The wetlands within the study site were delineated based on GPS coordinate waypoints taken of onsite indicator features. The accuracy of the GPS device used was 3-6m and thus this may affect the accuracy of the maps produced.
- In order to obtain definitive data regarding the biodiversity, hydrology and functioning of rivers and wetlands, studies should ideally be conducted over a number of seasons and over a number of years. This study was undertaken during a two-day field investigation conducted on the 30th and 31st May 2022. An assessment of some of the same wetland systems was undertaken from the 5th to 7th February 2021 for Phase 1 of the Ergo Gold PV project. While these short-term assessments may potentially miss certain ecological information, thus limiting accuracy, detail, and confidence, this limitation is regarded as being small to non-significant.

– Soils, Land and Agricultural Potential

- It is difficult to apply pure scientific methods within a natural environment without limitations or assumptions. The following apply to this study:
- Soil mapping was inferred from extrapolations from the auger sampling points, whose locations were recorded on GPS coordinate waypoints with an accuracy of 3 to 6m. The boundaries of the soil forms delineated within the site are based on these waypoint locations. It is impossible to achieve 100% purity in soil mapping, the delineated soil map units could include other soil types as the boundaries between the mapped soils are not sharp but rather gradual in reality.
- Soils classified as suitable to arable agriculture are also suited to other less intensive agricultural land uses, for instance pasture, natural grazing, and wildlife.
- Soil fertility status was not undertaken in this assessment.

– Heritage

- The authors acknowledge that the brief literature review is not exhaustive on the literature of the area. Due to the nature of heritage resources and pedestrian surveys, the possibility exists that some features or artefacts may not have been discovered/recorded and the possible occurrence of graves and other cultural material cannot be excluded. This limitation is successfully mitigated with the implementation of a Chance Find Procedure and monitoring of the study area by the Environmental Control Officer (ECO). This report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys. This study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components will be highlighted through the public consultation process if relevant. It is possible that new information could come to light in future, which might change the results of the Heritage Impact Assessment.

– Palaeontological

- Based on the geology of the area and the palaeontological record as we know it, it can be assumed that the formation and layout of the dolomites, sandstones, shales and sands are typical for the country and only some contain fossil plant, insect, invertebrate and vertebrate material. The sands of the Quaternary period would not preserve fossils.

– Visual

- This assessment was undertaken during the planning stage of the project and is based on information available at that time.

– Social

GAPS IN DATA

- In addition to the surveys obtained during the site visit, surveys for businesses and communities in proximity to the proposed project were distributed electronically; however no further responses were obtained, despite telephonic follow ups.
- The size and nature of the project is, however, not anticipated to have a far-reaching or regional socio-economic impact. The specialist was able to engage with a sample of residents immediately neighbouring the proposed PV facility site (the key area of direct impact). This is considered sufficient for the SIA process in context with the proposed project.
- Approximately 33% of the open land used for informal grazing activities by local subsistence and emerging farmers will be removed by the proposed project. The municipality representative (Social Development – Agriculture) and two farmers were interviewed. Local herders were not willing to engage (assumed to be due to fear of misrepresentation). Further investigations may be required to assess the potential impact on livelihoods of this loss.
- Issues raised through the public participation process have been included, but the process was not completed prior to the SIA study. This means that there could potentially be gaps in the information relating to stakeholders and key issues. The report is likely to require updating following the full public participation process for the Basic Assessment process.

LIMITATIONS

- Whilst a number of socio-economic issues affect the communities and their environment within the study area, the focus of the study was on the study area in terms of the proposed project and within the local context.
- Social impacts can be felt on an actual or perceptual level, and therefore it is not always possible or straightforward to measure the impacts in a quantitative manner.
- The focus of the assessment is limited to the social environment within the immediate vicinity of the proposed project, and so excluded detailed study of the broader region.
- There are different groups with different interests in the community, and while a project of this nature may be perceived as having positive or neutral social or socio-economic impacts by one group or individual, others may perceive or experience negative impacts. This duality is highlighted in the impacts section of the report. One of the limiting factors in assessing social issues is the difficulty of attaching values to these issues.

ASSUMPTIONS

- Demographic data from Provincial to Ward level was sourced from the Census 2011 data (Statistics SA, 2012), as this is the most up-to-date data available at this scale and is assumed to reflect the current socio-economic situation.
- It is assumed that the information provided by Environmental Management Assistance (Pty) Ltd, stakeholders interviewed, and the specialist studies is true and accurate.

q. Reasoned opinion as to whether the proposed activity should or should not be authorised

i. Reasons why activity should be authorised or not

Based on the above impact assessment it can be concluded that there are no environmental or social fatal flaws that would prevent this project from proceeding and the project should be authorised by the Competent Authority.

EMA is of the opinion that the solar PV facility, and associated infrastructure should be authorised, contingent on the implementation of the mitigations and monitoring measures contained in the EMPr.

ii. Conditions that must be included in the authorisation

The following recommendations for Environmental Authorisation apply and the project may only proceed:

The applicant should adhere to the conditions of the EA, EMPr and the Specialist reports for this project.

r. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The Environmental Authorisation is required for a ten (10) year period prior to the commencement of construction.

s. UNDERTAKING

It is confirmed that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the EIA and the EMPr. Refer to Appendix P for the signed affidavit and Part B Section 2.

t. FINANCIAL PROVISION

Sub Total 1:	ZAR 4 411 070.50
Subtotal 2:	ZAR 5 381 506.01 (inclusive of Preliminary and General, and Contingencies costs)
VAT (15%)	ZAR 807 225.90
Grand Total (before inflation)	ZAR 6 188 731.91

TOTAL after inflation@ 6% pa ZAR 18 724 624.19 (this figure reflects the closure cost at year 2042 calculated at an CPI rate of 6%, i.e. 20 years from start of anticipated operational date) Refer to Table 85.

i. Explain How the Aforesaid Amount Was Derived

The 40MW PV project will follow the Closure Plan as approved for the 19.9MW PV project (Phase 1) (SolaSynergy (2021) Decommissioning Report for DRD ERGO Mine). Refer to Table 84 for detailed calculations. The Project Proponent is required to make provision for the estimated closure cost of the Ergo SEF as calculated, by means of a Bank Guarantee or via an approved Rehabilitation Trust Fund. Upon approval from the DMRE of the quantum for financial provision on closure, the applicant will apply for a bank guarantee.

Table 84: Guideline Document Table of quantities and cost estimates for Plant Closure

CALCULATION OF THE QUANTUM

Applicant: **Tshedza 3 Investments (Pty) Ltd** **Ref No.: REF: GP158MREA**
Evaluators: **Date: 03-Aug-22**

No.	Description	Unit	A Quantity	C Master Rate	D Multiplication factor	E Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	160000	13.77	1	1	2 203 200.00
2 (A)	Demolition of steel buildings and structures	m2	0	181.45	1	1	-
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	267.39	1	1	-
3	Rehabilitation of access roads	m2	6300	32.46	1	1	204 498.00
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	315.14	1	1	-
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	172	1	1	-
5	Demolition of housing and/or administration facilities	m2	0	363	1	1	-
6	Opencast rehabilitation including final voids and ramps	ha	0	184693	1	1	-
7	Sealing of shafts adits and inclines	m3	0	97.5	1	1	-
8 (A)	Rehabilitation of overburden and spoils	ha	0	126822	1	1	-
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	157954	1	1	-
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	458771	1	1	-
9	Rehabilitation of subsided areas	ha	0	106194	1	1	-
10	General surface rehabilitation	ha	14	100464	1	1	1 406 496.00
11	River diversions	ha	0	100464	1	1	-
12	Fencing	m	2400	115	1	1	276 000.00
13	Water management	ha	14	38199	0.25	1	133 696.50
14	2 to 3 years of maintenance and aftercare	ha	14	13370	1	1	187 180.00
15 (A)	Specialist study	Sum	0	100000	1	1	-
15 (B)	Specialist study	Sum	0	100000	1	1	-
					Sub Total 1		4 411 070.50

1	Preliminary and General	529328.46	**weighting factor 2** 1	529 328.46
2	Contingencies	441107.05		441 107.05
			Subtotal 2	5 381 506.01
			VAT (15%)	807 225.90
			Grand Total	**6 188 731.91**

Table 85: CPI Band Ceiling = 6% (calculated in ZAR) for the 20 year lifespan of the 40MW PV SEF

2023	2024	2025	2026	2027
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**
6 188 731.91	6 560 055.83	6 953 659.18	7 370 878.73	7 813 131.45
2028	**2029**	**2030**	**2031**	**2032**
Year 6	**Year 7**	**Year 8**	**Year 9**	**Year 10**
8 281 919.34	8 778 834.50	9 305 564.57	9 863 898.44	10 455 732.35
2033	**2034**	**2035**	**2036**	**2037**
Year 11	**Year 12**	**Year 13**	**Year 14**	**Year 15**
11 083 076.29	11 748 060.87	12 452 944.52	13 200 121.19	13 992 128.46
2038	**2039**	**2040**	**2041**	**2042**
Year 16	**Year 17**	**Year 18**	**Year 19**	**Year 20**
14 831 656.17	15 721 555.54	16 664 848.87	17 664 739.80	18 724 624.19

ii. CONFIRM THAT THIS AMOUNT CAN BE PROVIDED FOR FROM OPERATING EXPENDITURE

According to the regulations set out in the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA) as amended, it is necessary for Project Proponent to compile a closure cost estimate to include the following works:

A 40MW solar PV power plant within the Ergo Mining Right Area (GP158MREA)

The solar PV power plant will be connected directly to the Mines 22kV emergency power supply line for the sole purposes of supplying electricity to the Ergo mining works and the Tailings facility.

The Closure plan is written in line with GNR. 1147 GG 39425 (2015), regulation 4 which refers to the determination and guarantee of financial provision of sufficient funds to undertaken rehabilitation and remediation of the adverse environmental impacts from related activities.

Regulation 5 states that “An applicant or holder of right or permit must make financial provision for

(a) rehabilitation and remediation; and

(b) decommissioning and closure activities at the end of prospecting, exploration, mining or production operations; and

(c) remediation and management of latent or residual environmental impacts which may become known in future, including the pumping and treatment of polluted or extraneous water”.

Regulation 6 and 7 must be consulted for cost details to be included in the annual rehabilitation plan, and final rehabilitation decommissioning and closure plan. The applicant must make financial provision at any given time equal to the sum of actual costs of the implementation of this plan for a minimum of 10 years forthwith (one for each of the first 10 years of operation, with the progressive total in the tenth year).

The SPV, Tshedza 3 Investments (PTY) LTD - REGISTRATION NO: 2020/830012/07 is a subsidiary to Ergo Mining. Tshedza 3 Investments (PTY) LTD can provide the decommissioning reserve bank guarantee (as calculated in Section S

for the land to be rehabilitated back to its current state. Commitment to closure objectives and decomissioning reserve will be negotiated between Ergo Mining and Tshedza 3 Investments (PTY) LTD at a later stage if necessary.

u. Indication of Deviation from approved scoping report

i. Deviation from the methodology used in determining the significance of potential environmental impacts and risks

No deviation from the methodology described in the scoping report, apart from:

- an additional access point for the construction/operational phase via an existing road network to access Portion 272 of the Farm Witpoortje 117 I.R. that is proposed via 17th Road- vehicles will drive past the old mine compound, continuing via an existing farm track previously used in apparent farming activities to the top of the proposed north PV block. Developer proposes to upgrade the existing farm track with gravel from below the compound to the proposed northern extent of the development.

ii. Motivation for deviation

No deviation from the methodology described in the scoping report.

v. Specific Information required by the Competent Authority

i. COMPLIANCE WITH THE PROVISIONS OF SECTIONS 24(4)(A) AND (B) READ WITH SECTION 24(3)(A) AND (7) OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998) THE EIA REPORT MUST INCLUDE THE:

(1) IMPACT ON THE SOCIO-ECONOMIC CONDITIONS OF ANY DIRECTLY AFFECTED PERSON

The potential impacts on the socio-economic conditions have the potential to include:

- The Increased Employment Opportunities (Construction)
- Increased Local Economic Development Opportunities (Construction)
- Reduced Public Safety (Construction)
- Increased Nuisance, Disruption and Indirect Costs (Construction)
- Reduced access to livelihood resources (Construction)
- Increased Employment Opportunities (Operation)
- Increased local economic stimulation opportunities (Operation)
- Increased Nuisance, Disruption and Indirect Costs (Operation)

- Reduced public safety and security (Operation)
- Loss of permanent jobs (Decommissioning)
- Loss of local economic opportunities (Decommissioning)
- Increased temporary employment (Decommissioning)

(2) IMPACT ON ANY NATIONAL ESTATE REFERRED TO IN SECTION 3(2) OF THE NATIONAL HERITAGE RESOURCES ACT

Heritage and Palaeontological recommendations proposed based on approval from SAHRA for the following conditions:

- Implementation of Chance Find Procedure for the project should be added to the EMPr;
- Monitoring of the study area by the ECO;
- If impacted on the standing structures (DRD008) must be assessed and recorded prior to the application for a destruction or alteration permit adhering to all legal requirements (as outlined in the Heritage Impact Assessment).
- Chance Find Protocol (Monitoring Programme) for Palaeontology – to commence once the excavations / drilling activities begin (Refer to Palaeontological Impact Assessment (Appendix L)).

w. Other matters required in terms of sections 24(4)(a) and (b) of the Act

The proof of investigations conducted by the specialist team is attached as Appendix D to Appendix O. No additional matters are noted for investigation other than the matters already considered and investigated within this EIA.

PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

The purpose of this section is to provide a baseline Environmental Management Programme (EMPr) to essentially form part of the Ergo Mining Solar Energy Facility's Environmental Management System (EMS). The information provided in this section describes guidelines, operating procedures and rehabilitation/pollution control requirements which will be a legal binding document which the holder of the authorisation, upon granting the Environmental Authorisation, will be held accountable for implementation.

The recommendations and procedures stipulated in the EMPr are based on the findings discussed in Part A of this report. It is therefore essential that this portion be carefully studied, understood, implemented, and adhered to at all times.

Part B of this report should be considered as a "living" document, to be reviewed and amended as deemed necessary.

The reasons for review and/or amendments may be the following:

- Failure to identify certain risk or impacts during the initial Environmental Impact Assessment process; and
- The ability of the EMPr to sufficiently provide for the avoidance, management, and mitigation of environmental impacts associated with the undertaking of authorised activities.

In the event that additional activities not specified in the EIA and EMPr are to take place, the impacts associated to these activities should be assessed according to the requirements stipulated by GN R. 982. Therefore this EMPr is only applicable to the listed authorising activities as stipulated *Part A section d)i)*.

1) Draft Environmental Management Programme.

Part B of this report is considered to be the first draft EMPr and is subject to the approval of the Department of Minerals, Resources and Energy (DMRE). Once approved, this report will be considered as finalised as the legal binding EMPr read together with the Environmental Authorisation (EA).

Environmental Management Approach

Globally, there are a number of tools or guideline documents available to assist or describe environmental management. The purpose of an EMPr (Part B of this report) is to describe the process of managing the identified potential environmental impacts or risks described in Part A of this report (EIR) throughout the entire life cycle (from design, to implementation, operation, and decommissioning) of the proposed Ergo Mining Solar Energy Facility (SEF). The IEM (Integrated Environmental Management) tool used for managing the identified environmental impacts by the EAP in this document is the Environmental Management System (EMS). This approach will assist the Ergo Mining SEF to achieve continual improvement in environmental performance.

The EMPr in essence will be adopting the approach of the internationally recognised ISO 14001 Environmental Management System (EMS) standard that is essentially based on the Deming Cycle rationale which is a simplified continuous improvement model consisting of four main iterative steps.

These steps are described as follows:

- Plan – Establish objectives and processes necessary to deliver results in accordance with the developed organisational environmental policy.
- Do – Implement the process.
- Check – Monitor and measure processes against environmental policy, objectives, legal and other requirements and report the results.
- Act – Take action to continually improve environmental performance.

Continual improvement is achieved by periodically monitoring and reviewing the EMPr and the subsequent implementation of corrective actions when required. Therefore this document should be considered as a living document which should be continuously updated and possibly improved.

This approach taken in the development of the EMPr is in line with the requirements stipulated in GN R. 982 (2014 EIA regulations as amended).

Legislative compliance

Throughout the development of management measures all legislative and other requirements associated to the proposed Ergo Mining SEF activities were considered and highlighted.

Specialist recommendations

A number of specialist investigations formed part of the EIA process and resulted in a number of findings and recommendations (Part A section 1)**j**) summarises the findings). These reports provided specific mitigation and management measures as a recommendation. These findings have been considered throughout the development of the EMPr.

a) Details of the EAP

(Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required)

As stipulated in ***Part A section 3 (a)***.

In addition to the EAP (Alicia Govender), Anandi Alers contributed to the compilation of this EMPr (Professional Natural Scientist, registration no: 400015/17; EAP no. 2019/1514). Refer to Appendix B for CV.

b) Description of the Aspects of the Activity

(Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required)

As stipulated in *Part A, section (3) (h)*.

c) Composite Map

(Provide a map (Attached as an Appendix) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)

Refer to Appendix C for site layout and sensitivity maps.

d) Description of Impact management objectives including management statements

Throughout Part A and Part B of this report, a number of possible environmental and social impacts/risks have been identified. The sections to follow will provide the management approach related to each potential impact/risk by defining management and outcome-based objectives.

i) Determination of closure objectives

(Ensure that the closure objectives are informed by the type of environment described)

As stated in Part A section 3 t)ii), the Ergo Mining Solar Energy Facility's closure objectives (Appendix Q) have been developed according to GNR. 1147 GG 39425 dated 20 November 2015 (as amended by GN 1314 GG40371 dated 26 October 2016, GNR. 452 GG 41584 dated 20 April 2018, GN 991 GG 41921 dated 21 September 2018, and GN 24 GG 42956 dated 17 January 2020) under section 44 (aE), (aF), (aG), (aH) read with sections 24 (5) (b) (ix), 24 (5) (d), 24N, 24 P, and 24R of the National Environmental Management Act (Act No. 107 of 1998) (NEMA).

ii) Volumes and rate of water use required for the operation.

The permitted volume and rate of water use required for the Ergo Mining SEF, will be confirmed in the Water Use Licence. However, an annual volume of ~200KL has been estimated at the time of this report.

The main uses for the abstracted water, at the time of this study, will be as follows:

- Dust suppression on the access roads,
- Cleaning of panels;
- Domestic purposes such as the ablution facilities, washing, drinking etc.

iii) Has a water use licence been applied for?

A water use licence application is currently being prepared, as part of the project requirements. An application for a water use licence will be required to be submitted to the Department of Water and Sanitation (DWS).

It is foreseen that based on the information collected to date, that a Water Use Licence in terms of the following water uses will be required to form part of the application:

- Section 21 (a) - taking water from a water resource (GN 538 of 2016 GG 40243)
- Section 21 (c) - Impeding or diverting the flow of water in a watercourse (GN 509 of 2016 GG 40229)
- Section 21 (i) - altering the bed, banks, course or characteristics of a watercourse (GN 509 of 2016 GG 40229)

iv) Impacts to be mitigated in their respective phases

(Measures to rehabilitate the environment affected by the undertaking of any listed activity)

In Part A of this report a number of potential environmental and social risks and or impacts was assessed. *TABLE 86* identifies and describes the measures to be taken to ensure a sustainable outcome.

Table 86: Recommended measures to control, avoid, mitigate, and remediate potential environmental and social risks identified in Part A of this report

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
Planning and Design Phase This section covers the mitigation measures and recommendations that may be considered in the planning and design stage of the Ergo SEF. <u>OVERALL REQUIREMENTS</u> The [16]Project Company is responsible for: • Ensuring that the design of the Ergo SEF Project responds to the identified environmental constraints and opportunities. • Ensuring that pre-construction activities are undertaken in accordance with all relevant legislative requirements, and that adequate regard has been taken of any landowner and community concerns and that these are appropriately addressed through adequate design and planning (where appropriate). • Ensuring that the best environmental options are selected for the linear components, including the internal access roads. • That the Ergo SEF Project construction activities to be undertaken without significant disruption to other land uses and activities in the area. In order to meet this goal, the following objectives have been identified, together with necessary actions and monitoring requirements.						
• Final layout	Potential impact on identified sensitive areas.	Pre-construction	Entire Ergo SEF Project development footprint (± 120 ha)	1) Control through avoidance: 2) Plan and conduct pre-construction activities in an environmentally acceptable manner. 3) Obtain any additional environmental permits required. 4) Consider and incorporate design level mitigation measures recommended by the specialists (refer to Part A and associated Specialist reports as appended). 5) Utilise existing Ergo mining infrastructure where possible, e.g., water related infrastructure (associated water storage tank/s) and other related infrastructure to minimize environmental impacts. 6) Consult a lighting engineer in the planning and placement of light fixtures for the Ergo SEF. 7) Locate transformers and other noise producing infrastructure as far from residential houses as possible. 8) The holder of an environmental authorisation has the responsibility to notify the competent authority of any alienation, transfer and, change of ownership rights in the property on which the activity is to take place. 9) Fourteen (14) days written notice must be given to the DMRE that the activity will commence. The notification must include a date on which the activity will commence as well as the reference number.	1) Application for EA as per GNR. 982 GG 38282 dated 4 December 2014 (as amended by GN 326 GG 40772 dated 7 April 2017 and GN 704 GG 41766 dated 13 July 2018). 2) Obtaining any other licences, permits or authorisations as required by provincial or national legislation.	Pre-construction

[16] *Company appointed by the holder of the authorisation to construct, operate, or decommission the listed activities.*

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
				10) Environmental Control Officer (ECO) to be appointed prior to the commencement of any authorised activities. Once appointed the name and contact details of the ECO must be submitted to the DMRE. 11) Do not plan any construction camps or laydown areas within the sensitive moist grassland or grassland vegetation that was not assessed by the vegetation specialist (refer to Appendix E). 12) Keep the development footprint as small as possible to make sure the vegetation remains functional. This will ensure that the surrounding vegetation can serve as a seedbank for the disturbed areas. 13) Follow recommendations and buffers as set out by the wetland specialist for wetlands and watercourses. 14) The extent of wetland conditions should be verified by a wetland specialist if there are any changes to the proposed footprint layout. 15) Plan the final site layout in a manner as to reduce alteration of drainage patterns. 16) Plan the final site layout in a manner as to reduce the destruction of wetlands, if possible, avoid working within a wetland. 17) A wetland delineation will be required before the commencement of any activities within a wetland. 18) Retain and maintain natural vegetation immediately adjacent to the development footprint and any fire break buffer zones.		
Pre-Construction Phase This section covers the mitigation measures and recommendations that may be considered in the preconstruction stage of the Ergo SEF. OVERALL REQUIREMENTS On-going communication through planning stage with affected and surrounding landowners, and relevant authorities as per required by National legislation or any other relevant guidelines. PERMIT REQUIREMENTS Activities undertaken during site preparation, construction and operation shall require additional permits. The Project Company is responsible for ensuring that they hold the necessary permits in order to comply with national and local regulations. i.e. land claims, Civil Aviation Authority; Water Use License; Tree Removal Permits (National and Provincial), SAHRA; Rezoning; SALA; MPRDA, road access permits etc.						
• All pre-construction activities associated with all components of the Ergo SEF Project	Impacts on affected environment, landowners and land uses surrounding the Ergo SEF Project	Pre- Construction	Entire Ergo SEF Project development footprint (± 120 ha), affected project site, and surrounding landowners.	Control through management: 1) Obtain all project licence, permits or authorisations prior to construction. 2) Ensure relevant licence, permits or authorisations remain valid for the activity duration required. 3) An Environmental Control Officer (ECO) with appropriate experience and qualifications in the implementation of environmental management specifications, must be appointed before the commencement of any construction activities. The ECO must act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. The ECO's responsibility must include the following: 4) Conducting periodic site inspections (as agreed with the competent authority); 5) Attend regular site meetings discussing findings from site inspections or any other concerns related to the environment and associated impacts;	3) Application for EA as per GNR. 982 GG 38282 dated 4 December 2014 (as amended by GN 326 GG 40772 dated 7 April 2017 and GN 704 GG 41766 dated 13 July 2018). 4) Obtaining any other licences, permits or authorisations as required by provincial or national legislation.	Pre-construction

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
				6) Pre-empt problems and suggest mitigation measures that arise during the site inspections; 7) Be available to advice on incidental issues that arise; 8) Conduct at least annual (or period agreed with the competent authority) compliance audits, verifying all records, monitoring reports, and adherence with the EMPr, by the holder of the authorisation; and 9) Liaising with the relevant competent authorities on the compliance status with the EA and EMPr (including the reporting of incidents in terms of section 30 of NEMA and section 20 of NWA). 10) Reviewing and approving all required management plans or method statements that is relevant to environmental management activities. 11) Develop and implement a grievance mechanism procedure identifying the required process for the I&AP, members of the public and all employees (permanent or contracted) to lodge a complaint during the construction, operational, and decommissioning phases of the facility. This procedure to be in line with the South African Labour Law. Formal records of complaints must be maintained for at least 5 years. 12) A Community Liaison Officer (or other appropriate appointed person) must develop and implement a communications or engagement plan, to ensure all affected I&AP are made aware of each project phase. This plan to include the following: 13) An up-to-date database of all relevant stakeholders, including at least: (i) immediate neighbours on Tenth Street and along the overhead line route; (ii) other relevant local community representatives such as the Ekurhuleni Municipal Ward Councillors; and (iii) Social Development Department. 14) Method of communication for various scenarios including the frequency of communications and the means to be used. 15) Person responsible for communication at each stage and according to each situation. 16) All environmental incidences must be recorded and reported as per the Guidelines on the administration of incidents (published in 2019 or the latest version) as described in section 30 of the NEMA. Records of all incidents must be kept for the entire duration of the proposed development. 17) Ensure the design of the facility promotes the minimalization of visual impacts on the immediate neighbouring property (i.e. Tent Street). The usage of natural paint colours on infrastructure to ensure it blends with the landscape is promoted. 18) Installed lighting features should be low impact, for example outside lighting should not be white, but coloured with the beam directed vertically downwards and activated by motion detectors. 19) Minimise vegetation removed from site and plant vegetation barriers using appropriate, indigenous species on the south-eastern side of the site. The selection of vegetation species must be consulted with the ECO and a suitably qualified vegetation specialist (SACNASP registered). 20) Alien invasive species, in particular category 1b species that were identified within the study area (Dimela Eco Consulting, 2021), should be removed from the development footprint and immediate surrounds, prior to construction or soil disturbances. By removing these species, the spread of seeds will be		

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
				prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation. 21) Manual removal is preferred to chemical control, particularly in the moist grassland. 22) Only suitably trained contractors (e.g. certified by the South African green Industries Council (SAGIC)) with knowledge of the species in question should be employed. 23) All alien seedlings and saplings must be removed as they become evident for the duration of construction. 24) All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the construction areas. This should be verified by the ECO. 25) If filling material is to be used, this should be sourced from areas free of invasive species..		
	Impacts on avifauna associated with the project footprint and surrounding areas.	Pre- Construction	Entire Ergo SEF Project development footprint, affected project site, surrounding land	Control through management: 1) Prior to commencement of construction commencing, an ECO must be trained by an avifaunal specialist to identify potential Red Data species (as identified in Appendix G) as well as the signs that indicate possible breeding by these species. 2) The ECO must then, during audits/site visits, make a concerted effort to look out for such breeding activities of Red Data species, and such efforts may include the training of all relevant staff (e.g. in Toolbox talks) to identify Red Data species, followed by regular questioning of staff as to the regular whereabouts on site of these species. 3) If any of the Red Data species are confirmed to be breeding (e.g. if a nest site is found), construction activities within 500 m of the breeding site must cease, and an avifaunal specialist is to be contacted immediately for further assessment of the situation and instruction on how to proceed.	1) EIA and EMPr. 2) Avifauna report (*Appendix G*).	Pre-construction
	Impacts associated with identified heritage features and identified site of historical importance	Pre- Construction	Entire Ergo SEF Project development footprint (± 120 ha)	Control through management: 1) Before the commencement of any construction activities, all heritage features as identified in Appendix K must be clearly demarcated, retained in-situ, and be recorded on development plans. 2) The appointed ECO must form part of the site walkabout identifying these features and report on its status and condition throughout the construction phase. 3) If during the initial site walkabout possible heritage features not identified Appendix K are found, the site layout plan must be updated accordingly before commencement of construction. 4) If impacted on the standing structures, DRD008 (Refer to Appendix K) must be assessed and recorded prior to the application for a destruction or alteration permit adhering to all legal requirements prior to the commencement of construction, a suitably qualified archaeologist must be appointed to lead this assessment. 5) Appropriate permits for surface sampling and excavation must be obtained by the appointed archaeologist should one be required under the National Heritage Resources Act (Act 25 of 1999).	1) Ensure compliance with relevant legislation and recommendations from SAHRA under Section 36 of NHRA 2) Heritage Impact Assessment Report (*Appendix K*).	Pre-construction

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
				6) All finds must be recorded on the archaeological record of the area.		
Construction Phase This section covers the mitigation measures and recommendations that may be considered in the Construction Phase of the Ergo SEF. OVERALL REQUIREMENTS This specification covers the requirements for controlling the impact on the environment of all construction activities for the Ergo SEF Project. All construction activities will be undertaken in line with this specification as well as any relevant environmental legislation and in so doing shall be undertaken in such a manner as to minimize impacts on the natural and social environment.						
Terrestrial Biodiversity - Flora and Fauna						
• Site establishment (construction yard, offices and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction	Destruction of natural vegetation of medium sensitivity (moist grasslands) Destruction of modified vegetation of low sensitivity Exposure to erosion and subsequent sedimentation or pollution of proximate moist grassland Removal / Destruction of protected plants and plants of conservation concern	Pre-construction & Construction Phase	Entire Ergo SEF Project development footprint (± 120 ha)	*Pre-construction measures:* As per comments received from the DFFE (11 October 2022): 1) Vegetation clearing within the sensitive grassland habitat, natural woody habitat and watercourse habitat must be limited to the approved areas. 2) Erosion management plan and rehabilitation plan of natural vegetation must be developed to mitigate on habitat degradation and consider all phases of the development. 3) Search and rescue plan for the Species of Conservation Concern (SCC) must be developed and submitted for approval and 4) Alien Invasive Plant (AIP) Management and Control Plan must be designed and implemented to manage the alien plant species on site and the plan must be submitted as part of the final report. 5) An area should be identified to re-instate protected and indigenous areas. 6) If feasible an onsite nursery should be established and maintained relocating identified species that could withstand rigorous transplant. These species typically include geophytes, succulents, and herb species. 7) All rescued species should be transplanted immediately or bagged (or succulents left to first air-dry before planting) and kept in the horticulturist's or a designated on-site nursery and should be returned to site or land portion once all construction is completed and rehabilitation of disturbed areas is required. 8) A method for clearance of vegetation must be compiled and approved by the ECO, clearly identifying the phases of site clearance. Ensure all relevant personnel are trained on the requirements. 9) Designated topsoil stockpiles must be determined and indicated on development plans. 10) Vegetation clearance or disturbances of soils must be planed and take into consideration the potential for erosion formation. Areas to be cleared must be clearly demarcated to eliminate unnecessary clearing. 11) An Erosion Control and Storm water management Plan must be developed and approved by the ECO. This management plan must address at least the following: 12) Identification of erosion control measures taken during the planned site clearance. 13) Identification of Storm Water Management Activities.	1) Obtaining any other licences, permits or authorisations as required by provincial or national legislation. 2) Develop a plant species search and rescue management plan. 3) Develop and implement an alien eradication and control management plan.	Construction

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
	Potential increase in invasive vegetation Compaction and destruction of soils Trapping and killing of fauna			14) Measures to be implemented to minimise the transport of sediment off site, as well as to prevent the discharge of high velocity flows into downslope wetlands. 15) Measure to be implemented to prevent erosion at discharge points. 16) Monitoring and reporting requirements. Control through *vegetation management*: 17) An independent Ecological Officer (EO) or Environmental Control officer (ECO) should be appointed to oversee construction. No go areas can be demarcated prior to commencement of works as per recommendations of ecological specialist (Appendix E). 18) A temporary fence or demarcation must be erected around the construction area (include the servitude, construction camps, areas where material is stored and the actual footprint of the development) to prevent access to sensitive environs. 19) Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area. 20) No open fires are permitted within naturally vegetated areas. 21) Do not dump litter or material within any vegetated aeras. 22) Keep the development footprint as small as possible. The project infrastructure footprint and associated area of disturbance should be minimised as far as practically possible with adequate spacing between panels to encourage shrubland growth. 23) Make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas. 24) A vegetation rehabilitation plan should be implemented at the start of construction. The modified grassland can be removed as sods and stored within modified areas – remove alien invasive vegetation prior to storing grasslands sods in transformed areas. The sods must preferably be removed during the winter months and be replanted by latest springtime. The sods should not be stacked on top of each other. Once construction is completed, these sods should be used to rehabilitate the disturbed areas from where they have been removed. In the absence of timely rainfall, the sods should be watered well after planting and at least twice more over the next 2 weeks. 25) Grass species, typical of the Highveld Grasslands can be sown in prepared soils. Revegetation should take place successively to re-establish vegetation as soon as possible after construction in a specific area. 26) Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority. 27) Where topsoils need to be removed, store such in a separate area where such soils can be protected until they can be re-used for post-construction rehabilitation. 28) Never mix topsoils with subsoils or other spoil materials.		

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
				29) Maintain site demarcations in position until the cessation of construction work. 30) After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction. 31) Do not allow erosion to develop on a large scale (e.g., beyond the initial onset of erosion) before acting. 32) Make use of existing roads and tracks where feasible, rather than creating new routes through grassland areas. 33) Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005). 34) Runoff from roads must be managed to avoid erosion and pollution problems. 35) Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. The grassland can be removed as sods and re-established after construction is completed. 36) Colonisation of the disturbed areas by plants species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study area. 37) Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas. 38) Prevent spillage of construction material, oils or other chemicals, strictly prohibit other pollution. Ensure there is a method statement in place to remedy any accidental spillages immediately. 39) After construction clear any temporarily impacted areas of all foreign materials, re-apply and/or loosen topsoils and landscape to surrounding level. 40) The EO / ECO should take note of any unearthed geophytes or orchids and contact a specialist for the correct naming and threat status of the species. This will determine whether any follow-up action is required. 41) Implement an alien invasive plant monitoring and management plan whereby the spread of alien and invasive plant species into the areas disturbed by the construction are regularly removed and re-infestation monitored. 42) Vehicles and machinery may not veer from the dedicated roads. 43) Once construction is complete, obsolete roads should be obliterated by breaking the surface crust and erecting earth embankments to prevent erosion, while the natural species composition should be re-established. 44) Prior to construction, the topsoil must be removed and stored separately from subsoil. The topsoil is imperative for the successful re-establishment of indigenous vegetation and it carries seed from the existing vegetation.		

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
				45) Topsoil (the upper 25 cm of soil) is an important natural resource; where it must and can be stripped, never mix it with subsoil or any other material, store and protect it separately until it can be re-applied, minimise handling of topsoil. 46) Topsoil is typically stored in berms with a width of 150 – 200 cm, and a maximum height of 100 cm, preferably lower, ideally in a disturbed but weed-free area. Place berms along contours or perpendicular to the prevailing wind direction. 47) Rapid decomposition of organic material in warm, moist topsoils decreases microbial activity necessary for nutrient cycling, and reduces the number of beneficial micro-organisms in the soil. Therefore, topsoil should therefore not be stored for extensive periods, and it is recommended that the reapplication of topsoil takes place as soon as possible. Adhere to the following general rule: the larger the pile of topsoil storage needs to be, the shorter should be the time it is stored 48) Topsoil handling should be limited to stripping, piling (once), and re-application. 49) Any movement of heavy machinery or vehicles over stored topsoils must be strictly prohibited. *Avoid loss of Fauna through conservation:* 1) Monitor Threatened or Protected Species (TOPS) observed to enter the site, specifically the Rietspruit Tributary area during rainfalls for Giant Bullfrog activity. 2) Should monitoring indicate that aspects of the development are posing a risk to these species, then activity ceased or management must be adapted to protect these species. Any requirements of the Gauteng Nature Conservation Ordinance complied with regarding handling of such species. 3) The gravel road crossing the Rietspruit Tributary should not be utilised by any construction vehicles during the rainy season if the bullfrogs are observed to be active near the area. 4) Conduct all excavations for pylons near the Rietspruit Tributary during the dry season. Should this not be possible, no activity is to take place within this area during the rainy season if the bullfrogs are observed to be active in the construction areas. 5) No poisons against fauna are to be brought on site. 6) No deliberate killing or trapping of indigenous fauna is allowed on site. 7) Environmental awareness training must include the prohibition of any harm or hindrance to any indigenous fauna species and the consequences of such actions. 8) Should any fauna be trapped within the development area, activities will cease and specialists brought in to safely remove the animals from site in line with the Gauteng Nature conservation Ordinance. 9) Additional mitigation in the form of insulating sleeves on jumpers present on strain poles, terminal poles and box transformers should also be considered. 10) No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present		

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
Avifauna						
• Site establishment (construction yard and offices) • Operation of construction camps • Clearing of vegetation at construction footprints: PV • Site preparation and earthworks • Site clearing and topsoil stripping • Open excavations (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV construction	Displacement as a result of habitat loss: Displacement as a result of disturbance:	Construction	Entire Ergo SEF Project development footprint (± 120 ha)	1) Avoid removal of sensitive vegetation types. The recommendations of the botanical study must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned. 2) Construction activity should be restricted to the immediate footprint of the infrastructure. 3) All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment. 4) All temporary disturbed areas should be rehabilitated according to the site's rehabilitation plan, following construction. 5) Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum. 6) Conduct a pre-construction inspection (avifaunal walk-through) of the final SEF layout, to identify any species that may be breeding on the authorised development site or within the immediate surrounds to ensure that any impacts likely to affect breeding species (if any) are adequately managed. 7) Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. 8) Measures to control noise should be applied according to current best practice in the industry.	1) EIA and EMPr. 2) Avifauna report (Appendix G).	Construction
Aquatic Ecosystems						

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
• Site establishment (construction yard and offices) • Operation of construction camps • Clearing of vegetation at construction footprints: PV • Site preparation and earthworks • Site clearing and topsoil stripping • Open excavations (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV construction	Flooding Sedimentation and siltation of water courses and wetlands Alteration of natural drainage patterns Contamination of water resources Degradation of aquatic habitat Degradation of surface and groundwater quality Destruction of wetlands	Construction	Entire Ergo SEF Project development footprint (± 120 ha)	Control *through storm water management and erosion control:* 1) A Storm Water Management Plan and associated infrastructures as recommended in Appendix H must be developed by a registered engineer. 2) Avoid stockpiling material within 32 m of drainage lines or in the 1:10 year flood line. A 100 m stream buffer to be maintained to reduce flood risk and preserve natural vegetation as far as possible. 3) Ensure erosion control measures or sediment control measures on stockpiles or in stockpile areas. 4) Clean and dirty water should be managed separately as guided by GN704. Deflect any unpolluted water/runoff away from any dirty areas i.e. stockpile areas, mining areas, workshops, lay down areas etc. 5) Measures must be put in place to attenuate water from infrastructure areas and reduce runoff. 6) During construction through drainage lines, most of the flow must be allowed to pass down the stream. In stream diversions should be used rather than the construction of new channels. 7) If drainage patterns will be altered, the natural flow to be diverted. 8) Any diversions should be designed in such a manner as to avoid erosion formation or pollution through siltation and sedimentation. 9) Channels and drainage systems required to divert the flow of drainage lines to be designed by a civil engineer, taking into consideration the peak volumes and flow. 10) Measures to avoid or prevent erosion must be incorporated into the designs of the infrastructure associated with the river crossings. 11) During construction through drainage lines, most of the flow must be allowed to pass down the stream. In stream diversions should be used rather than the construction of new channels. 12) Avoid unnecessary cutting roads through river, stream banks as this may lead to erosion causing siltation of streams and downstream dams. 13) Topsoil stockpiles must be appropriately protected using for example silt fences or sandbag barriers. 14) Do not allow surface water or storm water to be concentrated, or to flow down slopes without erosion protection measures being in place. 15) All cleared areas and sumps are to be monitored for erosion daily, any erosion forming is to be remediated with immediate effect. *Avoid destruction or alteration of wetlands and/or watercourses through conservation:* 1) If a wetland will be altered, mitigation measures to reduce the impact on the wetland must be strictly monitored. 2) Do not allow the use of any drainage line or wetland for swimming, bathing, or cleaning of clothing, tools or equipment. 3) No stockpiling of any materials may take place adjacent to any of the natural wetland systems.	1) Implement monitoring programme as per *TABLE 91*. 2) Design and implementation of the storm water management plan as per *Appendix H* addressing the separation of "dirty" and clean "areas". 3) Development of emergency response plan with specific reference to spill prevention and remediation. 4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. 5) Ensure compliance with the WUL/GA conditions.	Construction

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
				4) Make use of existing access roads as much as possible and plan additional access routes if required to avoid wetland systems. 5) Portable toilets must be placed outside of a 100m buffer from any of the delineated wetlands *Avoid through incident management and emergency preparedness*: 1) Any spill which may contaminate water must be treated according to the approved spill management procedure. 2) Contain oil or fuel spills in water using an approved oil absorbent fibre. 3) Should contaminated water due to spillages or other unforeseen circumstances enter identified wetland or watercourse, a wetland/aquatic specialist must be consulted regarding implementation of suitable mitigation and/or rehabilitation measures. 4) Wastewater as well as spilled fuel collected within bunded areas and refuelling areas shall be disposed of or treated as hazardous waste. 5) Fuel to be stored in above ground storage tanks or sealed containers. 6) Do not locate chemical storage areas associated with the construction camp or construction site on any of the hydric soils (whether natural or artificially saturated), without ensuring that these chemicals cannot leak or spill into these soil profiles. 7) Hazardous substances to be stored within a bund area with a sump drainage. 8) Bunded areas to be designed to contain at least 110% of the storing capacity. 9) All spills (minor and major) must be cleaned and remediated to the satisfaction of the appointed environmental representative or the competent authority within 24 hours. 10) Any spillages on site to be excavated to the visible depth of impact and disposed of for removal to a registered hazardous waste disposal site. Alternative in-situ remediation techniques may be used. 11) On site spill kits or absorbent materials must be readily available. These kits must include materials to absorb, breakdown, and where possible encapsulate minor material spillages. 12) Where possible and practical all maintenance of vehicles and equipment shall take place in the workshop areas. Should emergency repairs be necessary, drip trays or tarpaulins must be utilised to ensure the collection of any hydrocarbons. 13) All vehicles, plant, and equipment must be inspected daily. Records to be made available for these inspections. 14) Drip trays or any form of oil absorbent material must be placed underneath vehicles and equipment (where possible leaks may occur) when not in use. 15) All vehicles, plant, and equipment must be well maintained to minimise the risk of fuel and oil leakages. 16) Leaking equipment shall be removed and repaired immediately from site to facility designated for repairs.		

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
				Avoid through effluent and runoff management: 1) Prevent the discharge of water containing polluting matter or visible suspended materials directly into drainage lines or streams. 2) Construct containment berms to act as silt traps/settling facilities to contain dirty runoff from exposed areas. 3) Before any water is permitted to enter natural drainage lines, the quality of water must comply with the standards contained in the Water Use Licence conditions. 4) Wash bays, service areas, and fuel storage areas may not be located within the 1:100-year flood line or horizontal distance of 100 m (whichever is greater) of a watercourse or drainage line. 5) No environmentally harmful detergents may be used. 6) Workshops, refuelling depots and washing areas shall be bunded. 7) All bunded areas to be constructed in a way as to avoid seepage to the surrounding environment as well as be able to contain its content to a capacity of 110%. 8) Water from wash bays, service areas and fuel storage areas must be discharged into oil separators and sumps. 9) Oils collected in this manner should be retained in a safe holding tank and removed from site by a specialist oil recycling company or disposal at approved waste disposal sites. 10) No drainage from fuel storage areas to be permitted. 11) Never hose oil or fuel spills into storm water drain or sewer, or into the surrounding natural environment.		

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
Soils, land capability and agricultural potential						
• Site establishment (construction yard and offices) • Operation of construction camps • Clearing of vegetation at construction footprints: PV • Site preparation and earthworks • Site clearing and topsoil stripping • Open excavations (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV construction	Loss of agricultural productive land within the study area Soil Compaction leading to erosion and sedimentation Degradation of soil resources	Construction	Entire Ergo SEF Project development footprint (± 120 ha)	Control *through soil conservation and management:* 1) All areas to be stripped firstly of topsoil and fertile soils and stockpiled in a designated area. 2) Do not mix sub-soil with topsoil and fertile soils. 3) Topsoil and fertile soil to be protected from contamination (i.e. hydrocarbons or infertile material). 4) Topsoil and fertile soil stockpiles to be protected from weathering conditions such as covering the stockpiles with indigenous, non-invasive vegetation. 5) Avoid stockpiling topsoil and fertile soil stockpiles within drainage lines or within the 1:10 year flood lines. 6) Implement storm water control measures on topsoil and fertile soil stockpiles. 7) Exposed areas to be re-vegetated with indigenous or non-invasive species or protected from erosion. 8) Rehabilitation of areas after the completion of works to take place as soon as possible. *9)* Avoid overexposing un-vegetated areas as far as possible. *Avoid through erosion management:* 1) Soil conservation measures to be implemented on stockpiles to prevent erosion. This could include the use of erosion control fabric or non-invasive grass seeding. 2) All areas susceptible to erosion must be identified and protection measures be implemented. 3) Retain natural trees, shrubbery, and grass species where possible. 4) In areas within proximity to wetlands, rivers and streams, sedimentation control measures to be implemented, specifically when excavations or disturbances takes place within riverbanks, or the riverbed. 5) Formation of erosion channels (“dongas”) to be prevented by applying soil erosion control and bank stabilisation procedures as specified by a qualified environmental specialist. 6) Erosion formation beyond rills must be avoided. 7) Erosion damages to be repaired as soon as possible and no later than the target set by the *ECO*. 8) Where berms are installed on severe slopes the outflow shall be suitably stone pitched to prevent erosion from starting on berms. 9) Wherever possible, access routes should avoid crossing drainage lines and riparian zones. 10) Drainage lines should not be altered and should be level with the surrounding land once subsistence has occurred. 11) Run-off from roads must be managed in a way to avoid erosion and prevent pollution.	1) Design and implementation of the storm water management plan as per Appendix H addressing the separation of "dirty" and clean "areas". 2) Development of a soil conservation management plan. 3) Development and implementation of rehabilitation plan. 4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.	Construction
Air Quality						
• Site establishment (construction yard and offices)	Fugitive and ambient dust generation	Construction	Entire Ergo SEF Project development	*Control through dust & emission management*: 1) Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO.	1) Development and implementation of a Dust management plan.	Construction

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
• Operation of construction camps • Clearing of vegetation at construction footprints: PV • Site preparation and earthworks • Site clearing and topsoil stripping • Open excavations (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV construction	GHG emissions		footprint (± 120 ha)	2) Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be revegetated or stabilised as soon as is practically possible. 3) Develop and implement a dust suppression schedule. 4) Biodegradable and environmentally friendly flocculent (approved by the ECO) may be used as dust suppressant. 5) Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present. 6) During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level. 7) Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind. 8) Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO. 9) Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas. 10) For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust. 11) The loading, transfer and discharge of materials should take place with a minimum height of fall and be shielded against the wind. 12) During earth-moving works, pre-water areas to be disturbed. Plan earth moving works so that they are completed just prior to the time they are needed. 13) Switch off engines whilst not in use. 14) Establish a maintenance schedule to ensure proper maintenance of the trucks & mobile equipment. 15) Conduct regular maintenance and quality checks (engines/tyres) for all heavy mobile equipment/trucks	2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. 3) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009). 4) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013).	
Topography and Visual						
• Site establishment (construction yard and offices) • Operation of construction camps • Clearing of vegetation at construction footprints: PV	Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed PV facility	Construction	Entire Ergo SEF Project development footprint (± 120 ha)	*Control through site location and construction management*: 1) Construct temporary screens south of the PV plant construction site to shield construction activities from observers at the Withok Small Holdings. 2) Ensure that vegetation is not unnecessarily removed (outside of the development footprint) during the construction phase. 3) Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. 4) Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities.	1) Adherence to finalised approved layout plan and alternatives.	Construction

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
• Site preparation and earthworks • Site clearing and topsoil stripping • Open excavations (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV construction	Visual impact on observers travelling along the roads and residents at homesteads within the region (within a 1 – 3km radius of the PV facility structures). The potential impact on the sense of place of the region.			5) Reduce and control construction dust using approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent). 6) Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts. 7) Rehabilitate all disturbed areas immediately after the completion of construction works. 8) Lighting impacts to be mitigated by: Shielding the sources of light by physical barriers (walls, vegetation, or the structure itself); Limiting mounting heights of lighting fixtures, or alternatively using foot-lights or bollard level lights; Making use of minimum lumen or wattage in fixtures; Making use of down-lighters, or shielded fixtures; Making use of Low Pressure Sodium lighting or other types of low impact lighting; and Making use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.		
Noise						
• Site establishment (construction yard and offices) • Operation of construction camps • Clearing of vegetation at construction footprints: PV • Site preparation and earthworks • Site clearing and topsoil stripping • Open excavations (foundations and cable trenches) • Construction and maintenance of access roads	Noise pollution	Construction	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *management, monitoring, minimizing and avoidance* 1) All machinery and equipment must be maintained in good working order and fitted with approved and specified muffler systems. 2) Compliance with local by-laws and regulations regarding the noise and hours of operation.	1) Keep a register of all noise complaints. 2) Investigate all noise complaints as per *TABLE 91.* 3) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.	Construction

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
• Movement of construction vehicles • PV construction						
Heritage and Palaeontology						
• Site establishment (construction yard and offices) • Operation of construction camps • Clearing of vegetation at construction footprints: PV • Site preparation and earthworks • Site clearing and topsoil stripping • Open excavations (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV construction	Destruction of graves (if applicable) Degradation of cultural significance heritage sites	Construction	Entire Ergo SEF Project development footprint (± 120 ha)	1) Avoid through management and conservation: 2) Implement chance find procedures in case possible heritage finds are uncovered 3) Monitoring of the study area by the ECO 4) If human remains are uncovered during authorised activities or archaeological work, the excavations affecting the burial must be stopped. 5) SAHRA should then be consulted and depending on the situation, the remains are either covered and left in situ, exposed (but not removed) and studies in situ, or fully excavated and studied with the consent and participation of the interested parties. 6) It is, therefore, advisable that if it is foreseen that any archaeological research will uncover human remains an agreement with the interested and affected parties and a permit for burials be obtained beforehand. 7) A suitable accredited archaeologist must be appointed on a watching brief to monitor the excavation of any grave sites. 8) At the onset of construction, all graves that might be affected should be clearly demarcated and if possible, fenced off to protect them from any accidental damage, whether they are earmarked for relocation, or not. 9) Should the decision be taken to propose the relocation of the affected graves, a suitably accredited and experienced service provider must be appointed to undertake relocation. 10) Relocation of grave relocation is dependent on permission for the action by the close relatives and interested and affected parties from the community, and the requirement is that the developer must assist this community to fulfil their cultural and religious requirements during the process. 11) No archaeological artifacts or infrastructures may be destructed or removed from site without the required permissions. 12) If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager and finally to the ECO. 13) It is the responsibility of the senior on-site manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area.	1) Ensure compliance with the National Heritage Resources Act (NHRA), No. 25 of 1999. 2) Ensure compliance with the Human Tissue Act, 1983 (Act no. 65 of 1983.	Construction

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
				14) The senior on-site manager will inform the ECO of the chance find and its immediate impact on operations. The ECO must then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA. 15) A register with GPS locations of each feature as identified in the Heritage Impact Assessment (Appendix K) to be kept on site. All employees, including contractors, to be made aware of these sites. The register to include pictures and must be inspected quarterly.		
Socio-economic						
• Employment of personnel during construction • Procurement of construction materials and equipment during construction	Increased employment opportunities Local economic development Reduced public safety Increased nuisance, disruption and indirect costs Reduced access to livelihood resources Increased local economic stimulation opportunities	Construction & Operational	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *local employment and procurement management*: 1) Maximise and monitor local recruitment by ensuring that, where possible, construction contractors appoint at least 25% of their workforce from the local area – i.e. preferably within 10 km radius[17] of the site or from within Ekurhuleni Local Municipality as a minimum – but as long as this does to not conflict with labour law. 2) Consultation with local communities through the appropriate channels (namely Ekurhuleni Local Municipality and Department of Labour) must be conducted to make use of local skills and businesses where possible. 3) Ensure local employment and local services providers are appointed where possible from the local area - i.e. preferably within 10 km radius of the site or from within Ekurhuleni Local Municipality as a minimum. 4) Prevent nepotism / corruption in local recruitment structures through transparent and fair recruitment practices. 5) As far as possible, ensure that goods and services are procured from within the local area – i.e. preferably within 10 km radius of the site or from within Ekurhuleni Local Municipality as a minimum – by: i. Developing a register of local Small, Medium and Micro Enterprises (SMMEs) that could provide goods and services; and ii. Identify and develop links with skills development/ SMME development institutions 6) Fence and secure the construction area as soon as practically possible, and preferably at the commencement of construction. 7) Engage with neighbouring residents and businesses an ongoing basis (at least every two months). ►	1) Develop and implement a grievance lodging procedure. 2) Develop and implement community plans, including communications plan, and community health and safety plan (see *TABLE 91)*	Construction and Operational
Health and Safety						

[17] *Note: there is not information on the skills base within 10 km radius of the site. The aim of this recommendation is to ensure that local communities are prioritised for labour and other appointments, so as to maximise local benefits.*

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
• Employment of personnel during construction • Procurement of construction materials and equipment during construction	Health and safety of employees and surrounding communities	Construction and Operational	Entire Ergo SEF Project development footprint (± 120 ha)	Control *through management and monitoring*: 1) Ensure compliance to the relevant Occupational Health and safety act and regulations. 2) All employees or sub-contractors entering site must be inducted to ensure the awareness of the developed health and safety plan. 3) A health and safety representatives to be appointed. 4) Regular inspections and observations of on-site activities shall take place. 5) All incidents to be reported, recorded, investigated, and mitigated. 6) Where required, adequate safety requirements for all areas to be clearly indicated. 7) Employees or sub-contractors must be informed as to what required PPE is applicable in working sections. 8) All site personnel and cub-contractors to be fully always equipped with appropriate PPE. 9) Safety signs to be provided in areas considered as high-risk zones. 10) Adequate first aid services must be provided. 11) Ongoing health and safety awareness campaigns must be promoted.	1) Develop and implement a Health Action Plan (HAP) for construction and operational phases. 2) Develop and implement an appropriate occupational health and safety management plan (incl. community safety initiatives, OHSE awareness campaigns at schools, churches, and social events).	Construction and Operational
Traffic Management						
• Construction and maintenance of access roads • Movement of construction vehicles • Movement of people	Construction vehicles and access roads Operation staff transportation trips, maintenance and delivery trips	Construction	Entire Ergo SEF Project development footprint (± 120 ha)	Control *through management and monitoring*: 1) Site Access: Upgrade of existing external access roads to the PV site and construction of new internal roads with crusher run or similar materials (not paved). a. External access via route approved as per phase 1: Upgrade of existing access road/s along slurry pipeline/ and or via 18th Street via Denne and Koot Road to the PV site, parallel to Tenth Street. b. An additional access point for the construction/operational phase via an existing road network to access Portion 272 of the Farm Witpoortje 117 I.R. is proposed via 17th Road- vehicles will drive past the old mine compound, continuing via an existing farm track previously used in apparent farming activities to the top of the proposed north PV block. Developer proposes to upgrade the existing farm track with gravel from below the compound. (Appendix O). 2) Adherence to OHSA regulations during the construction phase	1) Adherence to finalised approved layout plan and alternatives.	Construction
Waste Management						

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
• Site establishment (construction yard and offices) • Operation of construction camps • Clearing of vegetation at construction footprints: PV • Site preparation and earthworks • Site clearing and topsoil stripping • Open excavations (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV construction	General waste generation & Littering Hazardous waste generation	Construction, Operational, and Decommissioning	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *waste management and monitoring*: 1) Bins (sufficient number and capacity) to store general and hazardous produced on a daily basis shall be provided at construction yard, offices and camps. 2) The bins are to be animal proof, sealed bins that cannot leak leachate material and waterproof that rain water cannot enter into them. 3) Bins shall be emptied on a weekly basis or if there is a nauseous smell coming from them or vectors are breading within them. 4) An integrated waste management approach shall be used, based on the principles of waste minimisation, reduction, re-use and recycling of materials. 5) No waste material or litter shall be burnt or buried on site. 6) All solid waste shall be disposed of offsite at an approved municipal landfill site. 7) No wastewater shall be disposed of directly into watercourses unless the water quality meets the DWS general discharge limits. 8) All hazardous waste is to be stored in a hazardous waste container (sealed, leak proof, water proof container) clearly labelled. 9) The hazardous waste is to be collected and transported to a registered hazardous waste facility. 10) All waste manifestos are to be kept on site and up to date. 11) Weekly checks are to be done to see if all registers are up to date. 12) All ablutions are to be serviced weekly by a registered service provided, no contamination of sewage will be allowed on site. 13) The Service provider for ablutions is to ensure that when servicing the toilets, it is done in a manner as to prevent any spills from occurring. 14) All servicing of plant and equipment is to be undertaken off site. 15) In the case where an emergency service is required for plant or equipment on site, the soil is to be protected from any potential spills prior to the emergency service commences. 16) Hydrocarbon spill kits are to be readily available at construction sites and kept stocked. A register of the spill kits content is to be kept inside of the kit, once an item is used the item is to be re-placed immediately therefore extra items used to clean up a spill are to be kept on standby at all times	1) Compliance with the National Environmental Management: Waste Act, act no 59 of 2008 and associated regulations.	Construction, Operational and Decommissioning

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
Operational Phase This section covers the mitigation measures and recommendations that may be considered in the Operational Phase of the Ergo SEF. OVERALL REQUIREMENTS This specification covers the requirements for controlling the impact on the environment of all operational activities for the Ergo SEF Project. All operational activities will be undertaken in line with this specification as well as any relevant environmental legislation and in so doing shall be undertaken in such a manner as to minimize impacts on the natural and social environment. The operational period for the Ergo SEF Project will take approximately 20 – 25 years.						
Terrestrial Biodiversity - Flora and Fauna						
• Operation of the PV plant	Destruction of natural vegetation of medium sensitivity (moist grasslands) Destruction of modified vegetation of low sensitivity Exposure to erosion and subsequent sedimentation or pollution of proximate moist grassland Removal / Destruction of protected plants and plants of conservation concern	Operational	Entire Ergo SEF Project development footprint (± 120 ha)	Control *through vegetation management*: 2) After construction, the land must be cleared of rubbish (refuse, waste material and litter), surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction. 3) Ensure that maintenance work does not take place haphazardly, but according to a fixed plan. 4) Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. 5) Address erosion, applying soil erosion control and bank stabilisation procedures as needed. 6) Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. 7) Delay the re-introduction of livestock (where applicable) to all rehabilitation areas until an acceptable level of re-vegetation has been reached. 8) Maintain vegetation under PV panels. 9) Maintenance vehicles may not deviate from dedicated roads *Avoid loss of Fauna through conservation*: 10) Ensure that unhindered access for fauna is maintained along the ecological corridors as identified in Appendix F. 11) No deliberate killing or trapping of indigenous fauna is allowed on site. 12) Environmental awareness training must include the prohibition of any harm or hindrance to any indigenous fauna species and the consequences of such actions.	1) Obtaining any other licences, permits or authorisations as required by provincial or national legislation. 2) Develop a plant species search and rescue management plan. 3) Develop and implement an alien eradication and control management plan.	Operational

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
	Potential increase in invasive vegetation Compaction and destruction of soils Trapping and killing of fauna					
Avifauna						
• Operation of the PV plant	Collision Mortality (PV arrays): Habitat loss associated with altered run-off and chemical pollution Nest building on PV infrastructure:	Operational	Entire Ergo SEF Project development footprint (± 120 ha)	1) The PV panels should spend as little time as possible time in a vertical position as this presents a greater collision hazard. Single axis tracking will be utilized.. 2) An operational monitoring programme, that includes carcass searches to provide an indication of fatality rates as a result of collisions, and if there are any spatial, temporal or conditional patterns to the frequency of collisions. 3) Immediate mitigatory action to be taken upon record of first SCC collision mortality. 4) If repeated (<5) collision impacts of non-SCC are recorded once the SEF is operational, it is recommended that an avifaunal specialist investigate the mortalities and provide recommendations for site-specific mitigation to be applied reactively. 5) Most importantly, operational monitoring should highlight if mitigation (i.e. modifications to the panel design to reduce the illusionary characteristics of the panels) is required to reduce impacts to acceptable levels. 6) A carefully considered surface water/drainage management plan for the site must be developed. 7) The surface water management plan must stipulate the use of environmentally friendly and acceptable cleaning products. 8) If repeated quality of supply impacts are recorded once the 40MW SEF is operational, it is recommended that these impacts be assessed by a suitably qualified avifaunal specialist and site-specific mitigation be applied reactively.	Appendix G (Avifauna Report)	Operational
Aquatic Ecosystems						

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
• Operation of the PV plant	Flooding Sedimentation and siltation of water courses and wetlands Alteration of natural drainage patterns Contamination of water resources Degradation of aquatic habitat Degradation of surface and groundwater quality Destruction of wetlands	Operational	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *storm water management and erosion control:* 1) Maintain the Storm Water Management Plan and associated infrastructures 2) Measures must be put in place to attenuate water from infrastructure areas and reduce runoff. 3) Channels and drainage systems required to divert the flow of drainage lines to be inspected regularly ensuring no blockages or built up of debris or sediment. 4) Do not allow surface water or storm water to be concentrated, or to flow down slopes without erosion protection measures being in place. 5) All previously disturbed areas and sumps are to be monitored for erosion regularly. Any erosion forming is to be remediated with immediate effect. Avoid destruction or alteration of *wetlands and/or watercourses* through *conservation:* 1) If a wetland was altered during the construction phase, rehabilitation measures implemented must be monitored. The status of the altered wetlands must be inspected and reported by the ECO. 2) Do not allow the use of any drainage line or wetland for swimming, bathing, or cleaning of clothing, tools or equipment. 3) Make use of existing access roads as much as possible and plan additional access routes if required to avoid wetland systems. 4) Portable toilets must be placed outside of a 100m buffer from any of the delineated wetlands Avoid through *incident management and emergency preparedness*: 1) All spills must be treated according to the approved spill management procedure. 2) Contain oil or fuel spills in water using an approved oil absorbent fibre. 3) Should contaminated water due to spillages or other unforeseen circumstances enter identified wetland or watercourse, a wetland/aquatic specialist must be consulted regarding implementation of suitable mitigation and/or rehabilitation measures. 4) Wastewater as well as spilled fuel collected within bunded areas and refuelling areas shall be disposed of or treated as hazardous waste. 5) Fuel to be stored in above ground storage tanks or sealed containers. 6) Do not locate chemical storage areas associated with the construction camp or construction site on any of the hydric soils (whether natural or artificially saturated), without ensuring that these chemicals cannot leak or spill into these soil profiles. 7) Hazardous substances to be stored within a bund area with a sump drainage. 8) Bunded areas to be designed to contain at least 110% of the storing capacity. 9) All spills (minor and major) must be cleaned and remediated to the satisfaction of the ECO or the competent authority within 24 hours.	1) Implement monitoring programme as per *TABLE 91*. 2) Design and implementation of the storm water management plan as per *Appendix H* addressing the separation of "dirty" and clean "areas". 3) Development of emergency response plan with specific reference to spill prevention and remediation. 4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. 5) Ensure compliance with the WUL/GA conditions.	Operational

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
				10) Any spillages on site to be excavated to the visible depth of impact and disposed of for removal to a registered hazardous waste disposal site. Alternative in-situ remediation techniques may be used. 11) On site spill kits or absorbent materials must be readily available. These kits must include materials to absorb, breakdown, and where possible encapsulate minor material spillages. 12) Where possible and practical all maintenance of vehicles and equipment shall take place in the workshop areas. Should emergency repairs be necessary, drip trays or tarpaulins must be utilised to ensure the collection of any hydrocarbons. 13) All vehicles, plant, and equipment must be inspected daily. Records to be made available for these inspections. 14) Drip trays or any form of oil absorbent material must be placed underneath vehicles and equipment (where possible leaks may occur) when not in use. 15) All vehicles, plant, and equipment must be well maintained to minimise the risk of fuel and oil leakages. 16) Leaking equipment shall be removed and repaired immediately from site to facility designated for repairs. 17) All environmental incidences must be recorded and reported as per the Guidelines on the administration of incidents (published in 2019 or the latest version) as described in section 30 of the NEMA. Records of all incidents must be kept for the entire duration of the proposed development. Avoid through *effluent and runoff management*: 1) Prevent the discharge of water containing polluting matter or visible suspended materials directly into drainage lines or streams. 2) Construct containment berms to act as silt traps/settling facilities to contain dirty runoff from exposed areas. 3) Before any water is permitted to enter natural drainage lines, the quality of water must comply with the standards contained in the WUL/GA conditions. 4) Wash bays, service areas, and fuel storage areas may not be located within the 1:100-year flood line or horizontal distance of 100 m (whichever is greater) of a watercourse or drainage line. 5) No environmentally harmful detergents may be used. 6) Workshops, refuelling depots and washing areas shall be bunded. 7) All bunded areas to be constructed in a way as to avoid seepage to the surrounding environment as well as be able to contain its content to a capacity of 110%. 8) Water from wash bays, service areas and fuel storage areas must be discharged into oil separators and sumps. 9) Oils collected in this manner should be retained in a safe holding tank and removed from site by a specialist oil recycling company or disposal at approved waste disposal sites. 10) No drainage from fuel storage areas to be permitted. 11) Never hose oil or fuel spills into storm water drain or sewer, or into the surrounding natural environment.		
Soils, land capability and agricultural potential						

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
• Operation of the PV plant	Loss of agricultural productive land within the study area Soil Compaction leading to erosion and sedimentation Degradation of soil resources	Operational	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *soil conservation and management:* 1) Exposed areas to be re-vegetated with indigenous or non-invasive species or protected from erosion. 2) Rehabilitation areas must be inspected on a regular basis for signs of erosion formation. 3) Avoid overexposing un-vegetated areas as far as possible. *Avoid through erosion management:* 1) All areas susceptible to erosion must be identified and protection measures be implemented. 2) Retain natural trees, shrubbery, and grass species where possible. 3) In areas within proximity to wetlands, rivers and streams, sedimentation control measures to be implemented, specifically when excavations or disturbances takes place within riverbanks, or the riverbed. 4) Formation of erosion channels (“dongas”) to be prevented by applying soil erosion control and bank stabilisation procedures as specified by a qualified environmental specialist. 5) Erosion formation beyond rills must be avoided. 6) Erosion damages to be repaired as soon as possible and no later than the target set by the ECO. 7) Where berms are installed on severe slopes the outflow shall be suitably stone pitched to prevent erosion from starting on berms. 8) Run-off from roads must be managed in a way to avoid erosion and prevent pollution.	1) Design and implementation of the storm water management plan as per *Appendix H* addressing the separation of "dirty" and clean "areas". 2) Development of a soil conservation management plan. 3) Development and implementation of rehabilitation plan. 4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages.	Operational
Air Quality						
• Operation of the PV plant	Fugitive and ambient dust generation GHG emissions	Operational	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *dust & emission management*: 1) Take all reasonable measures to minimise the generation of dust as a result of operational activities to the satisfaction of the ECO. 2) Develop and implement a dust suppression schedule. 3) Biodegradable and environmentally friendly flocculent (approved by the ECO) may be used as dust suppressant. 4) Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas. 5) Establish a maintenance schedule to ensure proper maintenance of the trucks & mobile equipment. 6) Conduct regular maintenance and quality checks (engines/tyres) for all heavy mobile equipment/trucks	1) Development and implementation of a Dust management plan. 2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. 3) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009). 4) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013).	Operational
Topography and Visual						

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
• Operation of the PV plant	Visual impact of activities on sensitive visual receptors in close proximity to the proposed PV facility Visual impact on observers travelling along the roads and residents at homesteads within the region (within a 1 – 3km radius of the PV facility structures). The potential impact on the sense of place of the region.	Operational	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *site location and construction management*: 1) Plant dense perennial vegetation along the southern boundary of the PV plant in order to shield the operational plant from observers at the Withok Small Holdings. 2) Maintain the general appearance of the facility as a whole. 3) Existing roads should be utilised wherever possible. 4) During operation, the maintenance of the PV arrays and ancillary structures and infrastructure will ensure that the facility does not degrade, therefore avoiding aggravating the visual impact. 5) Roads must be maintained to forego erosion and to suppress dust, and rehabilitated areas must be monitored for rehabilitation failure. Remedial actions must be implemented as and when required. 6) Where sensitive visual receptors (if present), are likely to be affected it is recommended that the developer enter into negotiations with the property owners regarding the potential screening of visual impacts at the receptor site. This may entail the planting of vegetation, trees or the construction of screens. Ultimately, visual screening is most effective when placed at the receptor itself.	1) Adherence to finalised approved layout plan and alternatives.	Operational
Noise						
• Operation of the PV plant	Noise pollution	Operational	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *management, monitoring, minimizing and avoidance* 1) All machinery and equipment must be maintained in good working order and fitted with approved and specified muffler systems. 2) Compliance with local by-laws and regulations regarding the noise and hours of operation.	1) Keep a register of all noise complaints. 2) Investigate all noise complaints as per *TABLE 88.* 3) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.	Operational
Heritage and Palaeontology						
• Operation of the PV plant	Destruction of graves Degradation of cultural significance heritage sites	Operational	Entire Ergo SEF Project development footprint (± 120 ha)	Avoid through *management and conservation*: 1) If during the operations any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager and finally to the ECO.	1) Ensure compliance with the National Heritage Resources Act (NHRA), No. 25 of 1999. 2) Ensure compliance with the Human Tissue Act, 1983 (Act no. 65 of 1983.	Operational

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
				2) It is the responsibility of the senior on-site manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area. 3) The senior on-site manager will inform the ECO of the chance find and its immediate impact on operations. The ECO must then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA. 4) A register with GPS locations of each feature as identified in the Heritage Impact Assessment (Appendix H) to be kept on site. All employees, including contractors, to be made aware of these sites. The register to include pictures and must be inspected quarterly.		
Socio-economic						
• Employment of personnel during operations • Procurement of construction materials and equipment during operations	Increased employment opportunities Local economic development Reduced public safety Increased nuisance, disruption and indirect costs Reduced access to livelihood resources Increased local economic stimulation opportunities	Operational	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *local employment and procurement management*: 1) Maximise and monitor local recruitment by ensuring that, where possible, construction contractors appoint at least 25% of their workforce from the local area – i.e. preferably within 10 km radius of the site or from within Ekurhuleni Local Municipality as a minimum – but as long as this does to not conflict with labour law. 2) Consultation with local communities through the appropriate channels (namely Ekurhuleni Local Municipality and Department of Labour) must be conducted to make use of local skills and businesses where possible. 3) Ensure local employment and local services providers are appointed where possible from the local area - i.e. preferably within 10 km radius of the site or from within Ekurhuleni Local Municipality as a minimum. 4) Prevent nepotism / corruption in local recruitment structures through transparent and fair recruitment practices. 5) As far as possible, ensure that goods and services are procured from within the local area – i.e. preferably within 10 km radius of the site or from within Ekurhuleni Local Municipality as a minimum – by: 6) Developing a register of local Small, Medium and Micro Enterprises (SMMEs) that could provide goods and services; and 7) Identify and develop links with skills development/ SMME development institutions 8) Fence and secure the construction area as soon as practically possible, and preferably at the commencement of construction. 9) Engage with neighbouring residents and businesses an ongoing basis (at least every two months).	1) Develop and implement a grievance lodging procedure. 2) Develop and implement community plans, including communications plan, and community health and safety plan (see *TABLE 88)*	Operational
Health and Safety						

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
• Employment of personnel during operations • Procurement of construction materials and equipment during operations	Health and safety of employees and surrounding communities	Operational	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *management and monitoring*: 1) Ensure compliance to the relevant Occupational Health and safety act and regulations. 2) All employees or sub-contractors entering site must be inducted to ensure the awareness of the developed health and safety plan. 3) A health and safety representatives to be appointed during operations. 4) Regular inspections and observations of on-site activities shall take place. 5) All incidents to be reported, recorded, investigated, and mitigated. 6) Where required, adequate safety requirements for all areas to be clearly indicated. 7) Employees or sub-contractors must be informed as to what required PPE is applicable in working sections. 8) All site personnel and cub-contractors to be fully always equipped with appropriate PPE. 9) Safety signs to be provided in areas considered as high-risk zones. 10) Adequate first aid services must be provided. 11) Ongoing health and safety awareness campaigns must be promoted.	1) Develop and implement a Health Action Plan (HAP) for construction and operational phases. 2) Develop and implement an appropriate occupational health and safety management plan (incl. community safety initiatives, OHSE awareness campaigns at schools, churches, and social events).	Operational
Traffic Management						
• Maintenance of access roads • Movement of construction vehicles • Movement of people	Construction vehicles and access roads Operation staff transportation trips, maintenance and delivery trips	Operational	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *management and monitoring*: 1) Access to the proposed development during the operational phase is proposed from 10th/Alliance Street and is referred to as access option 2, or via the additional point of access proposed from 18th Street via Koot Road. in *Appendix O*.	1) Adherence to finalised approved layout plan and alternatives.	Operational
Waste Management						

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
• Operation of the PV plant	General waste generation & Littering Hazardous waste generation	Construction, Operational, and Decommissioning	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *waste management and monitoring*: 1) Bins (sufficient number and capacity) to store general and hazardous produced on a daily basis shall be provided at construction yard, offices and camps. 2) The bins are to be animal proof, sealed bins that cannot leak leachate material and waterproof that rain water cannot enter into them. 3) Bins shall be emptied on a weekly basis or if there is a nauseous smell coming from them or vectors are breading within them. 4) An integrated waste management approach shall be used, based on the principles of waste minimisation, reduction, re-use and recycling of materials. 5) No waste material or litter shall be burnt or buried on site. 6) All solid waste shall be disposed of offsite at an approved municipal landfill site. 7) No wastewater shall be disposed of directly into watercourses unless the water quality meets the DWS general discharge limits. 8) All hazardous waste is to be stored in a hazardous waste container (sealed, leak proof, water proof container) clearly labelled. 9) The hazardous waste is to be collected and transported to a registered hazardous waste facility. 10) All waste manifestos are to be kept on site and up to date. 11) Weekly checks are to be done to see if all registers are up to date. 12) All ablutions are to be serviced weekly by a registered service provided, no contamination of sewage will be allowed on site. 13) The Service provider for ablutions is to ensure that when servicing the toilets, it is done in a manner as to prevent any spills from occurring. 14) All servicing of plant and equipment is to be undertaken off site. 15) In the case where an emergency service is required for plant or equipment on site, the soil is to be protected from any potential spills prior to the emergency service commences. 16) Hydrocarbon spill kits are to be readily available at construction sites and kept stocked. A register of the spill kits content is to be kept inside of the kit, once an item is used the item is to be re-placed immediately therefore extra items used to clean up a spill are to be kept on standby at all times.	1) Compliance with the National Environmental Management: Waste Act, act no 59 of 2008 and associated regulations.	Construction, Operational and Decommissioning

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
Decommissioning Phase This section covers the mitigation measures and recommendations that may be considered in the Operational Phase of the Ergo SEF. OVERALL REQUIREMENTS This specification covers the requirements for controlling the impact on the environment of all decommissioning and closure activities for the Ergo SEF Project. All decommissioning activities will be undertaken in line with this specification as well as any relevant environmental legislation and in so doing shall be undertaken in such a manner as to minimize impacts on the natural and social environment. The decommissioning period for the Ergo SEF Project will take approximately 6 months.						
Terrestrial Biodiversity - Flora and Fauna						
• Decommissioning & rehabilitation of the PV plant	Destruction if natural vegetation Loss of threatened plant species and protected tree species Invasion of alien and invasive vegetation Exposure to erosion and subsequent sedimentation or pollution of proximate moist grassland Destruction of ecological corridors and ecological connectivity	Decommissioning	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *vegetation management*: 1) Once decommissioning has been completed, reinstate vegetation suitable within the PV facility. Monitor and inspect rehabilitated areas to ensure vegetation cover. 2) If monitoring finds that indigenous vegetation from the surrounding grasslands is not colonising the site, implement a re-vegetation plan to ensure that grass species that naturally occur in the Eastern Highveld Grassland, are sowed to re-establish indigenous plant cover. 3) Colonisation of the disturbed areas by plants species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study area. 4) The ECO must inspect all previously disturbed areas and report on the status of vegetation coverage. 5) Areas prone to erosion to be identified and inspected on a regular basis and measures to prevent erosion must be implemented as per the Storm Water and Erosion Management Plan. 6) Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. 7) Delay the re-introduction of livestock (where applicable) to all rehabilitation areas until an acceptable level of re-vegetation has been reached. 8) Use of herbicides and handpicking/ slashing to control alien plants in development footprint. 9) Manual removal is preferred to chemical control, particularly in the moist grassland. 10) Disposal of alien plants must be done in a manner that cannot propagate. 11) No alien plant should be allowed develop to a point of producing seed. 12) Awareness training on the identification of weeds and alien species to employees responsible for the management of these species. 13) All disturbed areas to be monitored on a regular basis for exotic or invasive plant species and weeds. 14) Chemical removal shall be used in accordance with the manufacturer's specification for weeds where mechanical eradication/control are no longer effective.	1) Obtaining any other licences, permits or authorisations as required by provincial or national legislation. 2) Develop a plant species search and rescue management plan. 3) Develop and implement an alien eradication and control management plan. 4) Implementation of closure and decommissioning plan (Appendix Q).	Decommissioning

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
	Trapping and killing of fauna			15) The type of chemical to be utilised must be determined in consultation with an herbicide consultant and the ECO. 16) Those exotic/invasive plant or weed which cannot be eradicated by means of herbicides, needs to be manually removed from site. 17) The herbicide consultant must have a Pest Control Operators licence. 18) Control the type of material imported to site to ensure that soil contamination, in terms of weed and alien invasive plants does not occur. Avoid loss of *Fauna* through *conservation*: 1) Ensure that unhindered access for fauna is maintained along the ecological corridors as identified in *Appendix F*. 2) No deliberate killing or trapping of indigenous fauna is allowed on site. 3) Environmental awareness training must include the prohibition of any harm or hindrance to any indigenous fauna species and the consequences of such actions.		
Aquatic Ecosystems						
• Decommissioning & rehabilitation of the PV plant	Flooding Sedimentation and siltation of water courses and wetlands Alteration of natural drainage patterns Contamination of water resources Degradation of aquatic habitat Degradation of surface and groundwater quality	Decommissioning	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *storm water management and erosion control:* 1) Maintain the Storm Water Management Plan and associated infrastructures 2) Measures must be put in place to attenuate water from infrastructure areas and reduce runoff. 3) Channels and drainage systems required to divert the flow of drainage lines to be inspected regularly ensuring no blockages or built up of debris or sediment. 4) Do not allow surface water or storm water to be concentrated, or to flow down slopes without erosion protection measures being in place. 5) All previously disturbed areas and sumps are to be monitored for erosion regularly. Any erosion forming is to be remediated with immediate effect. Avoid destruction or alteration of *wetlands and/or watercourses* through *conservation:* 1) If a wetland was altered during the construction and operational phase, rehabilitation measures implemented must be monitored. The status of the altered wetlands must be inspected and reported by the ECO. 2) Do not allow the use of any drainage line or wetland for swimming, bathing, or cleaning of clothing, tools or equipment. 3) Make use of existing access roads as much as possible and plan additional access routes if required to avoid wetland systems. 4) Portable toilets must be placed outside of a 100m buffer from any of the delineated wetlands Avoid through *incident management and emergency preparedness*:	1) Implement monitoring programme as per *TABLE 91*. 2) Design and implementation of the storm water management plan as per *Appendix H* addressing the separation of "dirty" and clean "areas". 3) Development of emergency response plan with specific reference to spill prevention and remediation. 4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. 5) Ensure compliance with the WUL/GA conditions. 6) Implementation of closure and decommissioning plan (*Appendix Q*).	Decommissioning

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
	Destruction of wetlands			1) All spills must be treated according to the approved spill management procedure. 2) Contain oil or fuel spills in water using an approved oil absorbent fibre. 3) Should contaminated water due to spillages or other unforeseen circumstances enter identified wetland or watercourse, a wetland/aquatic specialist must be consulted regarding implementation of suitable mitigation and/or rehabilitation measures. 4) Wastewater as well as spilled fuel collected within bunded areas and refuelling areas shall be disposed of or treated as hazardous waste. 5) Fuel to be stored in above ground storage tanks or sealed containers. 6) Do not locate chemical storage areas associated with the construction camp or construction site on any of the hydric soils (whether natural or artificially saturated), without ensuring that these chemicals cannot leak or spill into these soil profiles. 7) Hazardous substances to be stored within a bund area with a sump drainage. 8) Bunded areas to be designed to contain at least 110% of the storing capacity. 9) All spills (minor and major) must be cleaned and remediated to the satisfaction of the ECO or the competent authority within 24 hours. 10) Any spillages on site to be excavated to the visible depth of impact and disposed of for removal to a registered hazardous waste disposal site. Alternative in-situ remediation techniques may be used. 11) On site spill kits or absorbent materials must be readily available. These kits must include materials to absorb, breakdown, and where possible encapsulate minor material spillages. 12) Where possible and practical all maintenance of vehicles and equipment shall take place in the workshop areas. Should emergency repairs be necessary, drip trays or tarpaulins must be utilised to ensure the collection of any hydrocarbons. 13) All vehicles, plant, and equipment must be inspected daily. Records to be made available for these inspections. 14) Drip trays or any form of oil absorbent material must be placed underneath vehicles and equipment (where possible leaks may occur) when not in use. 15) All vehicles, plant, and equipment must be well maintained to minimise the risk of fuel and oil leakages. 16) Leaking equipment shall be removed and repaired immediately from site to facility designated for repairs. 17) All environmental incidences must be recorded and reported as per the Guidelines on the administration of incidents (published in 2019 or the latest version) as described in section 30 of the NEMA. Records of all incidents must be kept for the entire duration of the proposed development. Avoid through *effluent and runoff management*: 1) Prevent the discharge of water containing polluting matter or visible suspended materials directly into drainage lines or streams. 2) Construct containment berms to act as silt traps/settling facilities to contain dirty runoff from exposed areas.		

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
				3) Before any water is permitted to enter natural drainage lines, the quality of water must comply with the standards contained in the WUL/GA conditions. 4) Wash bays, service areas, and fuel storage areas may not be located within the 1:100-year flood line or horizontal distance of 100 m (whichever is greater) of a watercourse or drainage line. 5) No environmentally harmful detergents may be used. 6) Workshops, refuelling depots and washing areas shall be bunded. 7) All bunded areas to be constructed in a way as to avoid seepage to the surrounding environment as well as be able to contain its content to a capacity of 110%. 8) Water from wash bays, service areas and fuel storage areas must be discharged into oil separators and sumps. 9) Oils collected in this manner should be retained in a safe holding tank and removed from site by a specialist oil recycling company or disposal at approved waste disposal sites. 10) No drainage from fuel storage areas to be permitted. 11) Never hose oil or fuel spills into storm water drain or sewer, or into the surrounding natural environment.		
Soils, land capability and agricultural potential						
• Decommissioning & rehabilitation of the PV plant	Loss of agricultural productive land within the study area Soil Compaction leading to erosion and sedimentation Degradation of soil resources	Decommissioning	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *soil conservation and management:* 1) Rehabilitation areas must be inspected on a regular basis for signs of erosion formation. *2)* Avoid overexposing un-vegetated areas as far as possible. *Avoid through erosion management:* 1) All areas susceptible to erosion must be identified and protection measures be implemented. 2) In areas within proximity to wetlands, rivers and streams, sedimentation control measures to be implemented, specifically when excavations or disturbances takes place within riverbanks, or the riverbed. 3) Formation of erosion channels (“dongas”) to be prevented by applying soil erosion control and bank stabilisation procedures as specified by a qualified environmental specialist. 4) Erosion formation beyond rills must be avoided. 5) Erosion damages to be repaired as soon as possible and no later than the target set by the ECO. 6) Where berms are installed on severe slopes the outflow shall be suitably stone pitched to prevent erosion from starting on berms. 7) Run-off from roads must be managed in a way to avoid erosion and prevent pollution.	1) Design and implementation of the storm water management plan as per *Appendix H* addressing the separation of "dirty" and clean "areas". 2) Development of a soil conservation management plan. 3) Development and implementation of rehabilitation plan. 4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. 5) Implementation of closure and decommissioning plan (Appendix Q).	Decommissioning
Air Quality						
• Decommissioning & rehabilitation of the PV plant	Fugitive and ambient dust generation GHG emissions	Decommissioning	Entire Ergo SEF Project development	Control through *dust & emission management*: 1) Take all reasonable measures to minimise the generation of dust as a result of decommissioning activities to the satisfaction of the ECO. 2) Develop and implement a dust suppression schedule.	1) Development and implementation of a Dust management plan. 2) Ensuring compliance with the National Environmental Management: Air Quality Act	Decommissioning

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
			footprint (± 120 ha)	3) Biodegradable and environmentally friendly flocculent (approved by the ECO) may be used as dust suppressant. 4) Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas. 5) Establish a maintenance schedule to ensure proper maintenance of the trucks & mobile equipment. 6) Conduct regular maintenance and quality checks (engines/tyres) for all heavy mobile equipment/trucks.	(NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. 3) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009). 4) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013). 5) Implementation of closure and decommissioning plan (Appendix Q).	
Topography and Visual						
• Decommissioning & rehabilitation of the PV plant	Visual impact of activities on sensitive visual receptors in close proximity to the proposed PV facility Visual impact on observers travelling along the roads and residents at homesteads within the region (within a 1 – 3km radius of the PV facility structures). The potential impact on the sense of place of the region.	Decommissioning	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *site location and construction management*: 1) Plant dense perennial vegetation along the southern boundary of the PV plant in order to shield the operational plant from observers at the Withok Small Holdings. 2) Maintain the general appearance of the facility as a whole. 3) Existing roads should be utilised wherever possible. 4) During operation, the maintenance of the PV arrays and ancillary structures and infrastructure will ensure that the facility does not degrade, therefore avoiding aggravating the visual impact. 5) Roads must be maintained to forego erosion and to suppress dust, and rehabilitated areas must be monitored for rehabilitation failure. Remedial actions must be implemented as and when required. 6) Where sensitive visual receptors (if present), are likely to be affected it is recommended that the developer enter into negotiations with the property owners regarding the potential screening of visual impacts at the receptor site. This may entail the planting of vegetation, trees or the construction of screens. Ultimately, visual screening is most effective when placed at the receptor itself.	1) Adherence to finalised approved layout plan and alternatives. 2) Implementation of closure and decommissioning plan (Appendix Q).	Decommissioning
Noise						

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
• Decommissioning & rehabilitation of the PV plant	Noise pollution	Decommissioning	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *management, monitoring, minimizing and avoidance* 1) All machinery and equipment must be maintained in good working order and fitted with approved and specified muffler systems. 2) Compliance with local by-laws and regulations regarding the noise and hours of operation.	1) Keep a register of all noise complaints. 2) Investigate all noise complaints as per *TABLE 91.* 3) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.	Decommissioning
Heritage and Palaeontology						
• Decommissioning & rehabilitation of the PV plant	Destruction of graves Degradation of cultural significance heritage sites	Decommissioning	Entire Ergo SEF Project development footprint (± 120 ha)	Avoid through *management and conservation*: 1) If during the decommissioning any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager and finally to the ECO. 2) It is the responsibility of the senior on-site manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area. 3) The senior on-site manager will inform the ECO of the chance find and its immediate impact on operations. The ECO must then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA. 4) A register with GPS locations of each feature as identified in the Heritage Impact Assessment (Appendix H) to be kept on site. All employees, including contractors, to be made aware of these sites. The register to include pictures and must be inspected quarterly.	1) Ensure compliance with the National Heritage Resources Act (NHRA), No. 25 of 1999. 2) Ensure compliance with the Human Tissue Act, 1983 (Act no. 65 of 1983.	Decommissioning
Socio-economic						
• Employment of personnel during decommissioning • Procurement of construction materials and	Increased employment opportunities Local economic development	Decommissioning	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *local employment and procurement management*: 1) Maximise and monitor local recruitment by ensuring that, where possible, construction contractors appoint at least 25% of their workforce from the local area – i.e. preferably within 10 km radius of the site or from within Ekurhuleni Local Municipality as a minimum – but as long as this does to not conflict with labour law. 2) Consultation with local communities through the appropriate channels (namely Ekurhuleni Local Municipality and Department of Labour) must be conducted to make use of local skills and businesses where possible.	1) Develop and implement a grievance lodging procedure. 2) Develop and implement community plans, including communications plan, and community health and safety plan (see *TABLE 91)*	Decommissioning

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
equipment during decommissioning	Reduced public safety Increased nuisance, disruption and indirect costs Reduced access to livelihood resources Increased local economic stimulation opportunities			3) Ensure local employment and local services providers are appointed where possible from the local area - i.e. preferably within 10 km radius of the site or from within Ekurhuleni Local Municipality as a minimum. 4) Prevent nepotism / corruption in local recruitment structures through transparent and fair recruitment practices. 5) As far as possible, ensure that goods and services are procured from within the local area – i.e. preferably within 10 km radius of the site or from within Ekurhuleni Local Municipality as a minimum – by: a. Developing a register of local Small, Medium and Micro Enterprises (SMMEs) that could provide goods and services; and b. Identify and develop links with skills development/ SMME development institutions 6) Fence and secure the construction area as soon as practically possible, and preferably at the commencement of construction. 7) Engage with neighbouring residents and businesses an ongoing basis (at least every two months).		
Health and Safety						
• Employment of personnel during decommissioning • Procurement of construction materials and equipment during decommissioning	Health and safety of employees and surrounding communities	Decommissioning	Entire Ergo SEF Project development footprint (± 120 ha)	Control through *management and monitoring*: 1) Ensure compliance to the relevant Occupational Health and safety act and regulations. 2) All employees or sub-contractors entering site must be inducted to ensure the awareness of the developed health and safety plan. 3) A health and safety representatives to be appointed during decommissioning. 4) Regular inspections and observations of on-site activities shall take place. 5) All incidents to be reported, recorded, investigated, and mitigated. 6) Where required, adequate safety requirements for all areas to be clearly indicated. 7) Employees or sub-contractors must be informed as to what required PPE is applicable in working sections. 8) All site personnel and cub-contractors to be fully always equipped with appropriate PPE. 9) Safety signs to be provided in areas considered as high-risk zones. 10) Adequate first aid services must be provided. 11) Ongoing health and safety awareness campaigns must be promoted.	1) Develop and implement a Health Action Plan (HAP) for construction and operational phases. 2) Develop and implement an appropriate occupational health and safety management plan (incl. community safety initiatives, OHSE awareness campaigns at schools, churches, and social events).	Decommissioning
Waste Management						
• Operation of the PV plant	General waste generation & Littering	Construction, Operational, and Decommissioning	Entire Ergo SEF Project development	Control through *waste management and monitoring*: 1) Bins (sufficient number and capacity) to store general and hazardous produced on a daily basis shall be provided at construction yard, offices and camps.	1) Compliance with the National Environmental Management: Waste Act, act no 59 of 2008 and associated regulations.	Construction, Operational and Decommissioning

ACTIVITIES	POTENTIAL IMPACT	PHASE	SIZE AND SCALE of disturbance *(volumes, tonnages and hectares or m²)*	MITIGATION MEASURES *(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)*	COMPLIANCE WITH STANDARDS *(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	TIME PERIOD FOR IMPLEMENTATION
	Hazardous waste generation		footprint (± 120 ha)	2) The bins are to be animal proof, sealed bins that cannot leak leachate material and waterproof that rain water cannot enter into them. 3) Bins shall be emptied on a weekly basis or if there is a nauseous smell coming from them or vectors are breading within them. 4) An integrated waste management approach shall be used, based on the principles of waste minimisation, reduction, re-use and recycling of materials. 5) No waste material or litter shall be burnt or buried on site. 6) All solid waste shall be disposed of offsite at an approved municipal landfill site. 7) No wastewater shall be disposed of directly into watercourses unless the water quality meets the DWS general discharge limits. 8) All hazardous waste is to be stored in a hazardous waste container (sealed, leak proof, water proof container) clearly labelled. 9) The hazardous waste is to be collected and transported to a registered hazardous waste facility. 10) All waste manifestos are to be kept on site and up to date. 11) Weekly checks are to be done to see if all registers are up to date. 12) All ablutions are to be serviced weekly by a registered service provided, no contamination of sewage will be allowed on site. 13) The Service provider for ablutions is to ensure that when servicing the toilets, it is done in a manner as to prevent any spills from occurring. 14) All servicing of plant and equipment is to be undertaken off site. 15) In the case where an emergency service is required for plant or equipment on site, the soil is to be protected from any potential spills prior to the emergency service commences. 16) Hydrocarbon spill kits are to be readily available at construction sites and kept stocked. A register of the spill kits content is to be kept inside of the kit, once an item is used the item is to be re-placed immediately therefore extra items used to clean up a spill are to be kept on standby at all times.		

e) Impact Management Outcomes

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in Part A Section m).

This section defines the objectives and targets ***TABLE 87*** associated to the mitigation programme.

Table 87: Impact management outcomes associated to the identified aspects

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE In which impact is anticipated	MITIGATION TYPE (modify, remedy, control, or stop)	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.	
					Objective	Target
Terrestrial Biodiversity - Flora and Fauna						
• Site establishment (construction yard, offices and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Destruction if natural vegetation Loss of threatened plant species and protected tree species Invasion of alien and invasive vegetation Exposure to erosion and subsequent sedimentation or pollution of proximate moist grassland Destruction of ecological corridors and ecological connectivity Trapping and killing of fauna	Fauna and Flora micro and macro ecosystems Soil quality	Construction, Operational, and Decommissioning	• Control through vegetation management. • Avoid loss of Fauna through conservation. Mitigation will be achieved by implementing measures as stipulated in *TABLE 86*.	1) Avoid unnecessary loss of vegetation and habitats. 2) Rehabilitation of all affected habitats and PV related areas. 3) Prevent the spreading of alien plants/seeds on site and to the surrounding areas. 4) Eradication and removal of alien and invasive plants.	1) Limiting site clearance to areas as per the approved site layout plan. 2) All sensitive or protected flora identified to be rescued and relocated. 3) Limit the presence of Category 1a Listed Invasive Species. Immediate steps to be taken to combat or eradicate these species. 4) Control 18Category 1b Listed invasive Species.
Aquatic Ecosystems						

18 The following Category 1b plants were observed during the initial site assessment: *Araujia sericifera ; Arundo donax;; Cereus hildmannianus / jamacaru ; Datura stramonium (M)*; *Eucalyptes* species ; *Mirabilis jalapa ; Robinia pseudoacacia ; and Solanum sisymbrifolium*

• Site establishment (construction yard, offices and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Sedimentation and siltation of water courses and wetlands Alteration of natural drainage patterns Contamination of water resources Degradation of aquatic habitat Degradation of surface and groundwater quality Destruction of wetlands	Wetlands and aquatic biodiversity Surface water quality Groundwater quality	Construction, Operational, and Decommissioning	• Control through *storm water management and erosion control.* • Avoid destruction or alteration of *wetlands and/or watercourses* through *conservation.* • Avoid through *incident management and emergency preparedness.* • Avoid through *effluent and runoff management.* Mitigation will be achieved by implementing measures as stipulated in *TABLE 86*.	1) Avoid or minimise the degradation of water quality of watercourses due to sedimentation and siltation. 2) Remedy the possible effects of alteration to natural drainage lines. 3) Avoid the destruction of wetlands. 4) Avoid the release of pollutants into the aquatic environment. 5) Wastewater is appropriately managed. 6) Erosion is prevented. 7) Suitable water management facilities and treatment works are developed and maintained. Adequate protection of soil and water resources. 8) Active remediation in case of spill is ensured. 9) Remedy the possible effects of destruction of upstream tributaries and reduction in the water catchment. 10) Adherence with water quality requirements set by the Water Use Licence Conditions.	1) Ensure water quality results falls within the regulated Resource Water Quality Objectives for the Vaal catchment. 2) Water quality of streams and rivers are maintained within the pre-determined seasonality baseline levels. 3) No incidents related to the pollution of rivers and streams. 4) No visible signs of erosion formations such as dongas or rills. 5) Erosion control measures implemented in high-risk areas. 6) No signs of degradation of diversion channels or drainage systems. 7) No evidence of pollutants released into streams and rivers. 8) No evidence of hydrocarbon and hazardous spills. 9) Immediate removal and remediation of all spills.
Soils, land capability and agricultural potential						
• Site establishment (construction yard, offices and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Loss of agricultural productive land within the study area Soil Compaction leading to erosion and sedimentation Degradation of soil resources	Soil quality Loss of fertile soil Soil contamination	Construction, Operational, and Decommissioning	• Control through *soil conservation and management.* • *Avoid through erosion management.* Mitigation will be achieved by implementing measures as stipulated in *TABLE 86*.	1) Adequate protection of soil resources and remediation if degradation cannot be avoided. 2) To prevent any erosion and to provide adequate erosion control measures where required.	1) No visible signs of erosion formations such as dongas or rills. 2) Sedimentation loads (measured in Total Dissolved Solids) of streams and rivers not to exceed the regulated Resource Water Quality Objectives for the Vaal catchment. 3) Erosion control measures implemented in high-risk areas. 4) No mixing of fertile soils[19] with sub soils during construction.
Air Quality						

5) [19] Soil with suitable nutritional value to reinstate indigenous vegetation of the area.

• Site establishment (construction yard, offices and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Fugitive and ambient dust generation	Air Quality	Construction, Operational, and Decommissioning	• Control through *dust & emission management.* Mitigation will be achieved by implementing measures as stipulated in *TABLE 86*.	1) Control dust fallout throughout the life cycle of the PV facility	1) Complaints from site staff, surrounding landowners and communities to be addressed. All complaints to be dealt with to a satisfactory level within a reasonable timeline as agreed by all parties involved. 2) Adherence with 600 mg/m² /day averaged over 30 days in residential areas and 1200 mg/m² /day averaged over 30 days in non-residential areas. 3) Exceedances no more than two within a year, no two sequential months per dust fallout monitoring site. 4) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust management plan to the competent authority (air quality officer) for approval. 5) All vehicles, plant, and equipment to be serviced as per manufacturer's maintenance schedules. 6) Record keeping of service records of all vehicles, plant, and equipment. 7) No evidence of plant, equipment, or vehicles in bad condition.
Topography and Visual						
• Site establishment (construction yard, offices and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant	Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed PV facility Visual impact on observers travelling along the roads and residents at homesteads within the region (within a 1 –	Topography and Visual Environment	Construction, Operational, and Decommissioning	• Control through *site location and construction management.* Mitigation will be achieved by implementing measures as stipulated in *TABLE 86.*	1) Remedy alteration of the visual environment and topography as close as possible to the predetermined state.	1) Minimise unvegetated areas. All construction areas must be rehabilitated as soon as possible. 2) Limit the presence of Category 1a Listed Invasive Species. Immediate steps to be taken to combat or eradicate these species. 3) Control Category 1b Listed invasive Species. 4) Complaints from site staff, surrounding landowners and communities to be addressed. All complaints to be dealt with to a satisfactory level within a reasonable timeline as agreed by all parties involved. 5) Adherence with 600 mg/m² /day averaged over 30 days in residential areas and 1200 mg/m² /day averaged over 30 days in non-residential areas. 6) Exceedances no more than two within a year, no two sequential months per dust fallout monitoring site. 7) If exceeding dust fallout standard, within 3 months after submission of a dust fallout monitoring report, develop and submit a dust

• Decommissioning & rehabilitation of the PV plant	3km radius of the PV facility structures). The potential impact on the sense of place of the region.					management plan to the competent authority (air quality officer) for approval.
Noise						
• Site establishment (construction yard, offices, and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Noise pollution	Surrounding noise quality	Construction, Operational, and Decommissioning	• Control through *management, monitoring, minimizing and avoidance.* Mitigation will be achieved by implementing measures as stipulated in *TABLE 86.*	1) Control potential noise pollution stemming from the construction of the project.	1) No noise complaints. 2) Investigation and closeout of all noise complaints within a 1000m radius as per *TABLE 91*.
Heritage and Palaeontology						
• Site establishment (construction yard, offices, and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Destruction of graves Degradation of cultural significance heritage site	Loss of heritage & palaeontological resources	Construction, Operational, and Decommissioning	• Avoid through *management and conservation.* Mitigation will be achieved by implementing measures as stipulated in *TABLE 86.*	1) Identification of all possible sites of archaeological value and graves have been identified prior to the commencement of authorised work.	1) All sites clearly demarcated as no-go areas. 2) Evidence of records should further discoveries be identified during construction. 3) Full compliance to all mitigation measures as identified in Table 86.
Socio-economic						
• Employment of personnel during entire project life cycle • Procurement of construction materials and equipment during entire project life cycle	Increased employment opportunities	Socio-economic conditions	Construction, Operational, and Decommissioning	• Control through *local employment and procurement management.* Mitigation will be achieved by implementing measures as stipulated in *TABLE 86.*	1) Promoting open public communication in terms of required labour. 2) Promoting the management of population influx associated to the mining operations in a sustainable manner.	1) No complaints from local landowners regarding loss of farm labour. 2) Peaceful negotiations regarding employment opportunities. 3) Provision of existing housing infrastructures. 4) Continuous awareness training on HIV/AIDS/STD in collaboration with local health service providers.

	Local economic development Reduced public safety Increased nuisance, disruption and indirect costs Reduced access to livelihood resources Increased local economic stimulation opportunities				3) Control convicting social pathologies. 4) Promoting peaceful negotiations with the surrounding communities and local business owner	5) Peaceful negotiations regarding employment, skills development, and financial provisions for social development projects.
Health and Safety						
• Employment of personnel during entire project life cycle • Procurement of construction materials and equipment during entire project life cycle	Health and safety of employees and surrounding communities	Human health and safe working environment	Construction, Operational, and Decommissioning	• Control through *management and monitoring*. Mitigation will be achieved by implementing measures as stipulated in *TABLE 86.*	1) Ensuring the health and safety of all personnel on site and the surrounding affected communities.	1) Record reportable Injuries. 2) Record incidents of reported pedestrian accidents. 3) Increased awareness on health and safety issues amongst employees and surrounding affected communities. 4) Visible evidence and use of PPE. 5) Support local healthcare facilities. 6) Monitor the exposure of employees to communicable diseases (Malaria, Tuberculosis, Covid-19, HIV, Hepatitis B etc.). 7) Monitor the exposure of employees and affected communities to noncommunicable diseases. 8) Monitor the exposure of employees and affected communities to potential hazardous materials. 9) Monitor the exposure of employees and affected communities to soil, water and sanitation related diseases. 10) Prevent the spread of sexually transmitted infections under employees and surrounding communities. 11) Improve water quality, wastewater treatment and safe reuse. 12) Universal access or awareness training to the importance of safe and nutritious food (if food is provided to employees). 13) Prevent and treat substance abuse by continuous awareness training and providing support to employees requiring treatment. 14) Monitor mortality from non-communicable diseases and promote mental health.
Traffic Management						

• Maintenance of access roads • Movement of construction vehicles • Movement of people	Construction vehicles and access roads Operation staff transportation trips, maintenance and delivery trips	Pressure on public transport infrastructure Socio-economic conditions	Construction, Operational, and Decommissioning	• Control through *management and monitoring*: Mitigation will be achieved by implementing measures as stipulated in *TABLE 86.*	1) Accidents are kept to a minimum. 2) The surface quality of the road is not negatively impacted resulting from haulage of PV facility product. 3) The presence of heavy vehicles turning are clearly indicated thereby minimising potential accidents. 4) Sections of existing road surfaces which have been impacted on by the haulage of PV facility product are remediated.	1) No incidents reported of vehicle, pedestrian, and livestock accidents. 2) Condition of road surface maintained. 3) No complaints from surrounding landowners or road users. 4) Clear visibility of warning signage. 5) Existing road surfaces are utilised and maintained within baseline levels.
Waste Management						
• Site establishment (construction yard, offices, and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	General waste generation & Littering Hazardous waste generation	Soil contamination Contamination of water resources Human health Socio-economic conditions	Construction, Operational, and Decommissioning	• Control through *waste management and monitoring*: Mitigation will be achieved by implementing measures as stipulated in *TABLE 86.*	1) Promoting the reduction, re-use, or recycle of waste where prevention is not possible. 2) Disposal of waste to local waste disposal sites is limited.	1) No littering. 2) No unpleasant odours. 3) Marked and sealable bins observed. 4) Evidence of waste disposal certificates.

f) Impact Management Actions

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved).

In the previous section management objectives and targets have been established. ***TABLE 88*** identifies management actions to be implemented to reach the defined objectives identified in ***TABLE 87***.

As part of the Ergo Mining SEF's Environmental Management System (based on the International ISO 14001:2015 standard) the following additional requirements must be implemented in order to promote continual improvement.

Development of an Environmental Policy

The management team of the Ergo Mining SEF shall define an organisational Environmental Policy and ensure that, within the defined scope of this EMS, it:

- Is appropriate to the nature, scale and environmental impacts of its activities, products and services;
- Includes a commitment to continual improvement and prevention of pollution;
- Includes a commitment to comply with applicable legal requirements and with other requirements to which the Ergo Mining SEF's subscribes which relate to its environmental aspects;
- Provides the framework for setting and reviewing environmental objectives and targets;
- Is documented, implemented, and maintained;
- Is communicated to all persons working for or on behalf of the Ergo Mining SEF's; and
- Is available to the public.

Legal and other requirements

The management team of the Ergo Mining SEF's shall establish, implement, and maintain a procedure (s) to:

- Identify and have access to the applicable legal requirements and other requirements to which the organisation subscribes related to its environmental aspects; and
- Determine how these requirements apply to its environmental aspects.

The managerial team of the Ergo Mining SEF's shall ensure that all the applicable legal requirements identified in Part A section 3*e)* or any other legislative requirements published after the approval of this report, to which the project subscribes are taken into account in establishing, implementing, and maintaining the Ergo Mining SEF's EMS.

Resources, roles, responsibility, and authority

Management shall ensure the availability of resources essential to establish, implement, maintain, and improve the Ergo Mining SEF's EMS. Resources include human resources and specialised skills, organisational infrastructure, technology, and financial resources.

Roles, responsibilities, and authorities must be defined, documented and communicated in order to facilitate effective environmental management.

Ergo Mining SEF's top management shall appoint a specific management representative(s) who, irrespective of other responsibilities, shall have defined roles, responsibilities, and authority for:

- Ensuring that an EMS is established, implemented, and maintained in accordance with the requirements stipulated by the Environmental Authorisation and approved EMPr; and
- Reporting to top management on the performance of the EMS for review including recommendations for improvement.

Competence, training, and awareness

The management team of the Ergo Mining SEF's shall ensure that any person(s) performing tasks for it or on its behalf have the potential to cause a significant environmental impact(s) identified by the project is (are) competent on the basis of appropriate education, training, or experience, and shall retain associated records.

Training needs associated with its environmental aspects and its EMS shall be identified. Actions shall be taken to provide the required training to meet the identified needs and records of this shall be kept.

The management of the Ergo Mining SEF's shall establish, implement, and maintain a procedure(s) to make persons working for it or on its behalf aware of the following:

- The importance of conformity with the established environmental policy, procedures, the EMPr, and Environmental Authorisation (EA);
- The significant environmental aspects and related actual or potential impacts associated with their work, and the environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformity with the requirements of the environmental management system; and
- The potential consequences of non-conformities from the specified procedures.

Communication

With regard to its environmental aspects and the EMS, the management team of the Ergo Mining SEF's shall establish, implement, and maintain a procedure(s) for:

- Internal communication among various levels and functions; and
- Receiving, documenting, and responding to relevant communication from external I&AP.

GN R. 982 (2014 EIA regulations) requires that the compliance of the environmental authorisation, EMPr, and closure plan (in compliance with GN R. 1147) be audited throughout the time these documentation remains valid.

Section 34 (6) of the 2014 EIA regulation stipulated the following:

"Within 7 days of the date of submission of an environmental audit report to the competent authority, the holder of an environmental authorisation must notify all potential and registered interested and affected parties of the submission of that report, and make such report immediately available- (a) to anyone on request; and (b) on a publicly accessible website, where the holder has such a website."

Therefore in order to comply with the requirement stipulated above, a method of communicating the auditing report shall be established and implemented.

Documentation

The Ergo Mining SEF's EMS documentation shall include the following:

- The Ergo Mining SEF's environmental policy and the objectives and targets specified in the EMPr (*TABLE 87*);
- Description of the scope of the EMS;
- Description of the main elements of the EMS and their interaction, and reference to related documents;
- Documents, including records required by the EMPr and EA; and
- Documents, including records, determined by the Ergo Mining SEF's EMS, EMPr and EA to be necessary to ensure effective planning, operation and control of processes that relate to its significant environmental aspects.

Operational Control

The identified significant environmental impacts and/or risk as specified in Part A of this report must be managed by identifying and planning those operations associated to each impact and/or risk that are

consistent with the developed environmental policy, objectives and targets, in order to ensure that they are carried out under specified conditions, by:

- Establishing, implementing and maintaining a documented procedure(s) to control situations where their absence could lead to deviation from the environmental policy, objectives and targets;
- Stipulating the operating criteria in the procedure(s); and
- Establishing, implementing, and maintaining procedures related to the identified significant environmental aspects of goods and services used by the Ergo Mining SEF and communicating applicable procedures and requirements to suppliers, including contractors or sub-contractors.

Emergency preparedness and response

Procedure(s) to identify potential emergency situations and potential accidents that can have an impact(s) on the environment and methods of respond to them shall be established, implemented, and maintained.

All actual emergency situations and accidents shall be responded to immediately and preventative or mitigation measures associated to the adverse environmental impacts shall be implemented.

This document shall be reviewed periodically and, where necessary, revise its emergency preparedness and response procedure after the occurrence of accidents or emergency situations.

The Emergency preparedness and response plan shall also periodically test such procedures where practicable.

Monitoring and measurement

As part of the Ergo Mining SEF's EMS, a procedure(s) to monitor and measure, on a regular basis, the key characteristics of the activities that can have a significant environmental impact must be established, implemented and maintained. This procedure shall include the documenting of information to monitor performance, applicable operational controls and conformity with the established objectives and goals. It must be inline and refer to the monitoring programme (***TABLE 91***).

Evaluation of compliance

In addition to the auditing requirements set by GN R. 982, the Ergo Mining SEF's shall establish, implement and maintain a procedure for periodically evaluating compliance with all requirements set out in the developed Ergo Mining SEF's EMS, the approved EMPr, EA, and closure plan (complying with the requirements set by GN R. 1147). Records of these results must be kept and communicated to all responsible persons.

Nonconformity, corrective action, and preventative action

A procedure for dealing with actual and potential nonconformities and for taking corrective and preventative actions shall be established, implemented, and maintained. This procedure should include and define the following requirements:

- Identifying and correcting nonconformity (ies) and taking action(s) to mitigate their environmental impacts;
- Investigating nonconformity(ies), determining their cause(s) and taking actions in order to avoid their recurrence;
- Evaluating the need for action(s) to prevent nonconformity(ies) and implementing appropriate actions designed to avoid their occurrence;
- Recording the results of corrective action(s) and preventative action(s) taken; and
- Reviewing the effectiveness of corrective action(s) and preventative action(s).

The actions to be implemented shall be appropriate to the magnitude of the problems and the environmental impacts encountered.

Internal Audit

As discussed in previous sections, GN R. 982 (2014 EIA regulations) requires that compliance with the environmental authorisation, environmental management programme and the closure plan be submitted to the competent authority. However, this shall not be the only audit report generated throughout the life cycle of the Ergo Mining SEF.

An internal audit of the Ergo Mining SEF EMS is recommended to be conducted on a annual (at least once before submitting independent audit report to the competent authority) basis, if found to be feasible. The purpose of these audits will be as follows:

- Determine whether the EMS conforms to the planned arrangements for environmental management including the requirements set out by the EMPr, EA, and Closure Plan;
- The EMS has been properly implemented and is maintained; and
- Provide information on the results of audits to be managed.

The purpose of the audit report is as follows:

- To describe findings or nonconformity(ies);
- Communicate compliance status to responsible persons;
- To determine compliance status with the EMPr, EA, and closure plan;

- Indicate areas requiring improvement; and
- Determine the accuracy of documented procedures and mitigation measures.

This audit must be conducted by an appointed suitably qualified person with the expertise of environmental management.

Management Review

Top management shall review the Ergo Mining SEF's EMS at planned intervals (recommended to occur at least biannually), to ensure its continuing suitability, adequacy and effectiveness. Reviews shall include assessing opportunities for improvement and the need for changes to the EMS, EMPr, EA, and closure plan. Records of these review meeting must be documented and kept.

Input to management reviews shall include:

- Results of internal audits and evaluations of compliance with legal and other requirements;
- Communication from external I&AP, including complaints;
- The environmental performance of the Ergo Mining SEF;
- The extent to which objectives and targets have been met;
- Status of corrective and preventative actions;
- Follow-up actions from previous management reviews;
- Changing circumstances, including developments in legal and other requirements related to its environmental aspects; and
- Recommendations for improvement.

The outputs from the management reviews shall include any decisions and actions related to possible changes to environmental policy, objectives and targets and other elements of the EMS, EMRr, EA, and closure plan, consistent with the commitment to continual improvement.

Table 88: Recommended management actions to be implemented to ensure objectives and targets are reached

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE (modify, remedy, control, or stop)	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
Terrestrial Biodiversity - Flora and Fauna				
• Site establishment (construction yard, offices and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Destruction if natural vegetation Loss of threatened plant species and protected tree species Invasion of alien and invasive vegetation Exposure to erosion and subsequent sedimentation or pollution of proximate moist grassland Destruction of ecological corridors and ecological connectivity Trapping and killing of fauna	• Control through *vegetation management*. • Avoid loss of *Fauna* through *conservation.* Mitigation will be achieved by implementing measures as stipulated in *TABLE 86*	Pre-construction, Construction, Operational, and Decommissioning	1) Develop a plant species search and rescue management plan. 2) Develop and implement a phased rehabilitation management plan. 3) Develop and implement a soil conservation management plan. 4) Apply for permits to remove protected species (provincial and national). 5) Develop and implement an alien eradication and control management plan.
Aquatic Ecosystems				
• Site establishment (construction yard, offices and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Sedimentation and siltation of water courses and wetlands Alteration of natural drainage patterns Contamination of water resources Degradation of aquatic habitat Degradation of surface and groundwater quality Destruction of wetlands	• Control through *storm water management and erosion control.* • Avoid destruction or alteration of *wetlands and/or watercourses* through *conservation.* • Avoid through *incident management and emergency preparedness.* • Avoid through *effluent and runoff management.* Mitigation will be achieved by implementing measures as stipulated in *TABLE 86*.	Pre-construction, Construction, Operational, and Decommissioning	1) Implement monitoring programme as per *TABLE 91*. 2) Implementation of the conceptual storm water management plan as per Appendix H addressing the separation of "dirty" and clean "areas". 3) Development of emergency response plan with specific reference to spill prevention and remediation (as per the national guideline). 4) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. 5) Ensure compliance with the WUL/GA conditions.

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE (modify, remedy, control, or stop)	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
Soils, land capability and agricultural potential				
• Site establishment (construction yard, offices and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Loss of agricultural productive land within the study area Soil Compaction leading to erosion and sedimentation Degradation of soil resources	• Control through *soil conservation and management.* • *Avoid through erosion management.* Mitigation will be achieved by implementing measures as stipulated in *TABLE 86*	Construction, Operational, and Decommissioning	1) Development of a soil conservation management plan. 2) Development of a storm water management plan. 3) Development and implementation of vehicle/plant/equipment maintenance plan with specific reference to daily inspections of plant/vehicles/equipment for leaks or breakages. 4) Development of a soil conservation management plan. 5) Development and implementation of PV rehabilitation plan.
Air Quality				
• Site establishment (construction yard, offices and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Fugitive and ambient dust generation GHG emissions	• Control through *dust & emission management.* Mitigation will be achieved by implementing measures as stipulated in *TABLE 86*.	Construction, Operational, and Decommissioning	1) Development and implementation of a Dust management plan as part of an Air quality management plan to including the monitoring and prevention programme. 2) Ensuring compliance with the National Environmental Management: Air Quality Act (NEMAQA), No. 39 of 2004 as amended by Act no 20 of 2014. 3) Ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009). 4) Ensuring compliance with the National Dust Control regulations (GNR 897 of November 2013). 5) Develop and implement an electricity usage monitoring programme.
Topography and Visual				
• Site establishment (construction yard, offices and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping	Visual impact of construction activities on sensitive visual	• Control through *site location and construction management.*	Pre-construction, Construction, Operational, and Decommissioning	(1) Adherence to the finalised approved lay out plan. (2) Review and implementation of the closure and rehabilitation plan.

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE (modify, remedy, control, or stop)	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
• Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	receptors in close proximity to the proposed PV facility Visual impact on observers travelling along the roads and residents at homesteads within the region (within a 1 – 3km radius of the PV facility structures). The potential impact on the sense of place of the region.	Mitigation will be achieved by implementing measures as stipulated in *TABLE 86*		
Noise				
• Site establishment (construction yard, offices, and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Noise pollution	• Control through *management, monitoring, minimizing and avoidance.* Mitigation will be achieved by implementing measures as stipulated in *TABLE 86.*	Construction, Operational, and Decommissioning	1) Keep a register of all noise and blasting complaints. 2) Investigate all noise complaints as per *TABLE 91*. 3) Develop and implement a vehicle/plant/equipment management plan to specifically include routine inspections and testing of sound frequencies.
Heritage and Palaeontology				
• Site establishment (construction yard, offices, and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks	Destruction of graves Degradation of cultural significance heritage site	• Avoid through *management and conservation.* Mitigation will be achieved by implementing measures as stipulated in *TABLE 86.*	Construction, Operational, and Decommissioning	1) Ensure compliance with the National Heritage Resources Act (NHRA), No. 25 of 1999. 2) Ensure compliance with the Human Tissue Act, 1983 (Act no. 65 of 1983. 3) Implement the mitigation plan as per *TABLE 86*. 4) Implement the monitoring programme as per *TABLE 91*.

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE (modify, remedy, control, or stop)	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
• Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant				
Socio-economic				
• Employment of personnel during entire project life cycle • Procurement of construction materials and equipment during entire project life cycle	Increased employment opportunities Local economic development Reduced public safety Increased nuisance, disruption and indirect costs Reduced access to livelihood resources Increased local economic stimulation opportunities	• Control through *local employment and procurement management.* Mitigation will be achieved by implementing measures as stipulated in *TABLE 86.*	Pre-construction, Construction, Operational, and Decommissioning	1) Develop and implement a Social Labour plan. 2) Develop and implement a grievance lodging procedure.
Health and Safety				
• Employment of personnel during entire project life cycle • Procurement of construction materials and equipment during entire project life cycle	Health and safety of employees and surrounding communities	• Control through *management and monitoring.* Mitigation will be achieved by implementing measures as stipulated in *TABLE 86.*	Construction, Operational, and Decommissioning	1) Develop and implement a Health Action Plan (HAP) for construction and operational phases. 2) Prepare and implement a specific covid-19 management plan for construction and operational phases. This should be aligned to the World Health Organisation (WHO) and South African Covid-19 Regulations. 3) Appoint a suitably qualified and experienced Environmental Health and Safety (EHS) practitioner whose responsibility should include managing, implementing, and reporting on the Health Action Plan. The EHS practitioner should be registered with South African Council for the Project and Construction Management Professions

ACTIVITY whether listed or not listed.	POTENTIAL IMPACT	MITIGATION TYPE (modify, remedy, control, or stop)	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
				(SACPCMP) at an appropriate level (as per 8(6) of the Construction Regulations) which will outline qualification and experience requirements. 4) Develop and implement an integrated waste management plan (see *TABLE 91*). 5) Develop and implement an integrated water management plan (see *TABLE 91*). 6) Develop and implement an appropriate occupational health and safety management plan (incl. community safety initiatives, OHSE awareness campaigns at schools, churches, and social events). 7) Ensure that a suitable/recognised food safety management system (e.g. HACCP/ISO22000) is implemented and monitored during construction and operations.
Traffic Management				
• Maintenance of access roads • Movement of construction vehicles • Movement of people	Construction vehicles and access roads Operation staff transportation trips, maintenance and delivery trips	• Control through *management and monitoring*: Mitigation will be achieved by implementing measures as stipulated in *TABLE 86.*	Construction, Operational, and Decommissioning	1) Develop and implement a traffic management plan (see *TABLE 91*). 2) Develop and implement a road maintenance plan (see *TABLE 91*). 3) Develop and implement a Public Complaints procedure.
Waste Management				
• Site establishment (construction yard, offices, and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	General waste generation & Littering Hazardous waste generation	• Control through *waste management and monitoring*: Mitigation will be achieved by implementing measures as stipulated in *TABLE 86.*	Construction, Operational, and Decommissioning	1) Compliance with the National Environmental Management: Waste Act, Act no 59 of 2008 and associated regulations.

i) Financial Provision

As part of the Ergo Mining SEF's Closure Plan (attached as Appendix Q), the financial provision for the PV operations were determined based on information currently available. This project budget will be incorporated with annual review taking into account annual inflation (at inflation@ 6% CPI pa). Tshedza 3 Investments (Pty) Ltd can provide this agreed decommissioning bank guarantee for the land rehabilitation. This will be negotiated at a later stage between Ergo Mining and the IPP (i.e., transfer to IPP for cost commitment).

It must be noted that the Closure Plan as prepared for Ergo SEF Phase 1 19.9MW (Appendix Q) is to be read as an addendum of the Mine's current Mine Closure, Rehabilitation and Liability Plan. Similarly, the proposed Ergo SEF Environmental Authorisation will act as an addendum to the current Mining Right (GP158MREA).

(1) Determined amount for Financial Provision

(a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under Regulation 22 (2) (d) as described in 2.4 herein

The identified site is currently vacant, and the development is proposed on a portion of land that was previously a gold mine tailings facility. This land has been re-mined, and subsequently rehabilitated to its current naturally vegetated condition which now comprises mostly disturbed grassland.

The objectives of the Ergo SEF Decommissioning, Closure and Rehabilitation Plan for the affected site is inclusive of:

- Returning any areas of disturbance to an acceptable environmental state;
- Control of erosion risk to ensure stability of the site;
- Ensure establishment of indigenous plant communities;
- Alien plant invasion control;
- Ensure that all areas are free-draining and non-polluting;
- Minimise visual impacts of rehabilitated areas by shaping the site where necessary to blend in with the natural landscape;
- Dust control on bare areas that are still to be rehabilitated and where indigenous vegetation is still to be established; and
- Ensure that the area is safe for the intended end land use.

DRD / ERGO Mine's overall shutdown and decommissioning plan shall be reviewed in conjunction with Design Criteria for Decommissioning of a Solar Plant and Decommissioning Plan for a Solar Plant (Refer to Appendix Q). It is envisaged that a specialist and qualified team with assistance and input from ERGO Mines shall lead the decommissioning portion of the close out of the Solar Plant. All decommissioning activities relating to the proposed Project will occur within the demarcated

area (refer to layout map (refer to Appendix C). Refer to Table 89 for a schedule of major decommissioning activities anticipated for the proposed project. The following decommissioning activities are anticipated to take place at the EOL of the proposed Ergo SEF:

- Shut down and disconnect the Ergo SEF from the mine's electrical system;
- Disconnect all related services;
- Dismantle
    - all solar PV panels and underground cabling, and dispose of them in accordance with waste management legislative requirements;
    - solar PV stands and tracking devices, and reclaim scrap metal where possible; and
- Demolish buildings.

Table 89: Schedule of Major decommissioning activities

Item No.	Decommissioning Activity
1.	Shutdown PV Panel charging facility and lock out charging side
2.	Isolate and lockout switchgear complete
3	Remove PV Panels from structures
3.1	Disconnect and remove cables. Resell or remove to recycling facilities
3.2	Remove PV Panels to approved recycling and waste facilities
3.3	Remove tracking drives to recycling and waste facilities
4.	Remove Inverter Stations
4.1	Disconnect and remove cables. Resell or remove to recycling facilities
4.2	Remove Inverter Stations to approved recycling and waste facilities
5.	Remove Balance of plant cabling and resell or move to recycling facilities
6.	Isolate, lock out and remove fire protection and detection systems
7.	Structural Steel
7.1	Dismantle PV support structures and resell or remove to recycling facilities
7.2	Empty out any shipping containers (when used) and resell or remove to recycling facilities
8.	Demolish reinforced concrete structures and buildings
9.	Rehabilitate surfaces
9.1	Rehabilitate Roads and subsided surfaces
9.2	Rehabilitate and grass other surfaces
10.	Remove Fencing and resell or remove to recycling facilities
11.	Aftercare and maintenance for about 2- years

(b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties

The Ergo Mining SEF's Closure Plan (as approved for Phase 1) forms part of the EIA and EMPr (Part A and Part B of this report) and is being subjected to the required Public Participation Process as described in *section h) ii) (Details of the Public Participation Process Followed) of Part A*. Comments received has been incorporated in *section h) iii) of Part A (and further detailed in Appendix D of the Public Participation Report)*.

(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main PV activities, including the anticipated PV area at the time of closure

Refer to Appendix Q for Closure Plan and Appendix C for site maps.

(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives

The Closure plan has been developed in line with GNR 1147 and according to the closure objectives. Refer to Appendix Q.

(e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline

Refer detailed to Table 90 below for a detailed quantum calculation.

Table 90: Guideline Table of quantities and cost estimates

CALCULATION OF THE QUANTUM

Applicant: **Tshedza 3 Investments (Pty) Ltd** **Ref No.: REF: GP158MREA**
Evaluators: **Date: 03-Aug-22**

No.	Description	Unit	A Quantity	C Master Rate	D Multiplication factor	E Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	160000	13.77	1	1	2 203 200.00
2 (A)	Demolition of steel buildings and structures	m2	0	181.45	1	1	-
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	267.39	1	1	-
3	Rehabilitation of access roads	m2	6300	32.46	1	1	204 498.00
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	315.14	1	1	-
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	172	1	1	-
5	Demolition of housing and/or administration facilities	m2	0	363	1	1	-
6	Opencast rehabilitation including final voids and ramps	ha	0	184693	1	1	-
7	Sealing of shafts adits and inclines	m3	0	97.5	1	1	-
8 (A)	Rehabilitation of overburden and spoils	ha	0	126822	1	1	-
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	157954	1	1	-
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	458771	1	1	-
9	Rehabilitation of subsided areas	ha	0	106194	1	1	-
10	General surface rehabilitation	ha	14	100464	1	1	1 406 496.00
11	River diversions	ha	0	100464	1	1	-
12	Fencing	m	2400	115	1	1	276 000.00
13	Water management	ha	14	38199	0.25	1	133 696.50
14	2 to 3 years of maintenance and aftercare	ha	14	13370	1	1	187 180.00
15 (A)	Specialist study	Sum	0	100000	1	1	-
15 (B)	Specialist study	Sum	0	100000	1	1	-
					Sub Total 1		4 411 070.50

1	Preliminary and General	529328.46	**weighting factor 2** 1	529 328.46
2	Contingencies	441107.05		441 107.05
			Subtotal 2	5 381 506.01
			VAT (15%)	807 225.90
			Grand Total	**6 188 731.91**

(f) Confirm that the financial provision will be provided as determined

Once the EA has been received, the applicant will review the annual rehabilitation plan as per GNR 1147, a financial provision as per regulation 7 and 8 must be provided.

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

- (g) Monitoring of Impact Management Actions
- (h) Monitoring and reporting frequency
- (i) Responsible persons
- (j) Time period for implementing impact management actions
- (k) Mechanism for monitoring compliance

As part of the Ergo Mining SEF's EMS, a procedure(s) to monitor and measure, on a regular basis, the key characteristics of the activities that can have a significant environmental impact must be established, implemented and maintained.

This procedure shall include:

- The documenting of information to monitor performance;
- Applicable operational controls and conformity with the established objectives and goals; and
- Procedure to address the monitoring requirements made in ***TABLE 91***.

It is recommended that a legal compliance and EMS audit be conducted annually and independently by suitably qualified auditors throughout the life of the PV plant, to monitor the compliance with requirements set out in the EMPr, EA, and closure plan. The outcome of this audit should be as follows:

- Advise on any mitigation measures which need to be added to the existing programmes;
- Communication of findings to PV management;
- Communicating environmental progress on the set objectives and targets in both the EMPr and closure plan; and
- Status of legal compliance with specific reference to all other relevant legislation.

The audit should take into consideration the management principles and strategies stated in the Environmental Management Programme and assess whether this strategy is providing the required results. Any flaws found in the rehabilitation process will be included in the audit report along with the recommended mitigation measures.

In section *1) e)* it is recommended that an internal audit of the Ergo Mining SEF's EMS is be conducted on an annual (at least once before submitting independent audit report to the competent authority) basis, if found to be feasible.

Table 91: Recommended mechanisms for monitoring compliance with and performance assessment against the EMPr

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Terrestrial Biodiversity - Flora and Fauna				
• Site establishment (construction yard, offices and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Destruction of natural vegetation Loss of threatened plant species and protected tree species Invasion of alien and invasive vegetation Exposure to erosion and subsequent sedimentation or pollution of proximate moist grassland Destruction of ecological corridors and ecological connectivity Trapping and killing of fauna	A plant search and rescue management plan must be developed and address at least the following: • Recommendations made in the Terrestrial Biodiversity assessment attached as Appendix E; • Address requirements issued on the plant species permit obtained; • Method of quantification and record keeping of search and rescued plants; and • Method of reinstating vegetation and ensuring rehabilitation objective is reached. A terrestrial biodiversity monitoring programme must be implemented, and the following aspects must form part of the protocol: • Fixed point monitoring should be applied as the preferred method of monitoring. The selection of monitoring points should consider the spatial layout of PV activities and infrastructure in relation to sensitive environments, also taking note of control points to provide a comparative assessment; • All data gathered should be measurable (qualitative and quantitative) – attention should be provided to species diversity and abundance; • Monitoring report should be repeatable and temporally and spatially comparable, with specific reference to seasonal variation; • Data, when compared to previous sets, should show spatial and temporal trends; and • General habitat unit overviews should also be undertaken to augment quantitative data. The annual monitoring programme will be executed by a suitable panel of specialists, preferably consisting of the following specialists: • Vegetation/ ecology specialist; • Faunal (invertebrate, mammal, reptile, and amphibian) specialist; and • Avifaunal specialists. Requirements for the appointed specialists should conform to the guidelines of the South African Council for Natural Scientific Professions Act (2019), and specifically adhere to regulations pertaining to the minimum requirements as per the National Environmental Management Act, 1998 (Act No. 107 of 1998). As part of the Annual botanical monitoring protocol, the following aspects will be executed:	1) ECO 2) Contractor's Environmental Representative (CEO) 3) Operator's Environmental Representative (OER) 4) Project Management	1) Review of soil conservation management plan as or when required. 2) Quarterly quantification of available fertile soil for rehabilitation. 3) Review of storm water management plan as or when required. 4) Annual or frequency stipulated by the competent authority compliance auditing with the PV Rehabilitation and closure plan. 5) Annual rehabilitation plan as per GN R. 1142. 6) Review of the Environmental Rehabilitation risk assessment as stipulated by the competent authority. 7) Frequent quantification review of search and rescued species. 8) Annual review or frequency as stipulated by the permit of plant removal permits. 9) Implementation of the terrestrial biodiversity monitoring protocol at a frequency of at least once annually, taking cognisance of seasonal variations. 10) Review of alien eradication and control management plan as or when required. 11) Weekly inspection of site for the visible signs of alien species establishment.

		• Selection of a suitable number of sampling points that is representative of the PV activities within a natural, receiving environment, with particular reference to sensitive habitat types and species of conservation concern; • Annual monitoring of vegetatal aspects during the active PV phase, including aspects of diversity, compositional and structural attributes as well as accumulation of impacts within nearby habitat; • Prevalence and continued persistence of plants of conservation concern; • Prevalence and continued persistence of plants with ethno-botanical properties; • Prevalence and management of alien and invasive plant species; and • Land change/ habitat loss and transformation. The following general monitoring guidelines should be included in the annual faunal monitoring protocol (inter alia): • Fixed point sampling and trapping procedures (annually) of invertebrates and small mammals; • Ad hoc, random sampling of all faunal groups during the same time of year (austral summer, after the first spring rains, preferably from late November onwards); The following monitoring guidelines should be included in the annual avian monitoring protocol: • Annual monitoring surveys, consisting of a minimum of 2 full days and should coincide with the peak wet season when most of the drainage lines and wetland features are inundated. This will enable the observed to obtain quantified data on bird richness abundance, which will contribute towards our understanding of impacts related to birds. • Obtaining presence and relative abundance data by means of fixed point counts (see methods used in this report) • Mapping of spatial localities (breeding, foraging and roosting habitat) of collision prone, threatened, near threatened and biome-restricted bird species. • Estimating relative densities of collision prone, threatened, near threatened and biome-restricted bird species by means of direct counts. • Detecting major flight routes of collision-prone and large threatened and near threatened species by means of vantage point counts. • Estimating the relative densities of passerine bird species by means of point counts. • Detecting relative population trends and movements of bird species at and near the development site. • Recommendations regarding the development and the set-up of a post-construction monitoring protocol. A soil conservation management plan must be developed and address at least the following: • Specify mitigation measures that will be implemented to prevent contamination of topsoil's and fertile soils; • Identify measures to be implemented preventing the loss of topsoil and fertile soils;		

		• Record keeping of available topsoil and fertile soil for use during the rehabilitation phase of an activity; and • Monitoring requirements. An alien eradication and control management plan must be developed and address at least the following: • Identification of areas prone to alien species in accordance with the applicable regulations and Appendix E; • Reference to recommendations made in Appendix E; • Frequency of monitoring and inspection requirements of areas prone to establish • methods; and • Including requirements stipulated in *TABLE 86*. Listed activities must be monitored frequently to ensure compliance with the EMPr, EA, and closure plan. Records to be kept of monitoring activities.		
Aquatic Ecosystems				
• Site establishment (construction yard, offices and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Sedimentation and siltation of water courses and wetlands Alteration of natural drainage patterns Contamination of water resources Degradation of aquatic habitat Degradation of surface and groundwater quality Destruction of wetlands	Monitoring requirements as stipulated by the conditions of the Water Use Licence (WUL) must be always complied with. Compliance with the requirements must be monitored. *Surface water monitoring* A Storm water management plan must be developed and implemented and address at least the following: • Recommendations made in the conceptual storm water management plan in Appendix H; • Requirements to monitor the functionality of storm water infrastructure; • Frequency of monitoring; • Dirty water containment methods and frequent quantification and control of volumes; • Water quality monitoring requirements; and • Methods addressing requirements set out in the WUL. Regular inspections of areas prone to hydrocarbon spills and contamination must be inspected on a regular basis. Contamination the affected environment will require remediation actions. *Soil contamination* After completion of remediation actions, it is recommended that samples be taken to ensure the soil quality comply with the rehabilitation objectives. *Water contamination*	1) ECO 2) Contractor's Environmental Representative (CEO) 3) Operator's Environmental Representative (OER) 4) Project Management	1) Review of storm water management plan as or when required. 2) Monthly reporting or frequency specified in the Water Use Licence/General Authorisation (WUL/GA). 3) Frequent inspections of diversion infrastructure. 4) WUL/GA audits as specified in licensing requirements. 5) Review of the water management plan as or when required. 6) Daily recoding of water usage. 7) Annual review of the Emergency preparedness and response plan or review after occurrence of emergency incident. 8) Weekly inspections of spill prevention equipment. 9) Review of vehicle/plan/equipment maintenance plan as or when required. 10) Daily inspections of vehicles/plant/equipment. 11) Weekly inspections of hazardous substances storage facilities. 12) Review of Hazardous substances management plan as or when required.

		Water samples should be taken to ensure compliance with legal thresholds and the baseline data as per the GA. Listed activities must be monitored frequently to ensure compliance with the EMPr, EA, and closure plan. Records to be kept of monitoring activities.		
Soils, land capability and agricultural potential				
• Site establishment (construction yard, offices and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Loss of agricultural productive land within the study area Soil Compaction leading to erosion and sedimentation Degradation of soil resources	A soil conservation management plan must be developed and address at least the following: • Specify mitigation measures that will be implemented to prevent contamination of topsoil's and fertile soils; • Identify measures to be implemented preventing the loss of topsoil and fertile soils; • Record keeping of available topsoil and fertile soil for use during the rehabilitation phase of an activity; and • Monitoring requirements A Storm water management plan must be developed and address at least the following: • Recommendations made in the conceptual storm water management plan in Appendix H; • Requirements to monitor the functionality of storm water infrastructure; • Frequency of monitoring; • Dirty water containment methods and frequent quantification and control of volumes; • Water quality monitoring requirements; and • Methods addressing requirements set out in the WUL. Listed activities must be monitored frequently to ensure compliance with the EMPr, EA, and closure plan. Records to be kept of monitoring activities.	1) ECO 2) Contractor's Environmental Representative (CEO) 3) Operator's Environmental Representative (OER) 4) Project Management	1) Review of soil conservation management plan as or when required. 2) Frequent quantification of available fertile soil for rehabilitation. 3) Review of storm water management plan as or when required. 4) Review of vehicle/plan/equipment maintenance plan as or when required. 5) Daily inspections of vehicles/plant/equipment. 6) Weekly inspections of spill prevention equipment.
Air Quality				

• Site establishment (construction yard, offices and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Fugitive and ambient dust generation GHG emissions	Ensure the development and implementation of an Air Quality Management Plan. The plan must at least address the following: • Methods of complying with legislative requirements (ensuring compliance with the National Ambient Air Quality Standards (GNR 1210 of 24 December 2009) and the National Dust Control regulations (GNR 897 of November 2013); • Methods of controlling dust generation; and • Identifying sensitive receptors and monitoring points.	1) ECO 2) Contractor's Environmental Representative (CEO) 3) Operator's Environmental Representative (OER) 4) Project Management	1) Review of Air quality management plan as or when required. 2) Monthly monitoring of compliance with the NEMAQA regulations. 3) Frequent visual inspections.
Topography and Visual				
• Site establishment (construction yard, offices and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Visual impact of construction activities on sensitive visual receptors in close proximity to the proposed PV facility. Visual impact on observers travelling along the roads and residents at homesteads within the region (within a 1 – 3km radius of the PV facility structures). The potential impact on the sense of place of the region.	Monitoring adherence with the requirements set out by GN R. 1142. Records to be kept of pre-construction topography. Alteration to be monitored and managed in accordance with the rehabilitation objectives. Visual monitoring and supervision of vegetation clearing during construction (by contractor as part of construction contract). Monitoring of rehabilitated areas quarterly for at least a year following the end of construction (by contractor as part of construction contract). Listed activities must be monitored frequently to ensure compliance with the EMPr, EA, and closure plan. Records to be kept of monitoring activities.	1) ECO 2) Contractor's Environmental Representative (CEO) 3) Operator's Environmental Representative (OER) 4) Project Management	1) Annual compliance auditing or frequency stipulated by the competent authority with the PV Rehabilitation and closure plan. 2) Review of the Annual rehabilitation plan as stipulated by GN R. 1142. 3) Annual review of the Environmental Rehabilitation risk assessment. 4) Frequent inspection of PV areas.

Noise				
• Site establishment (construction yard, offices, and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Noise pollution	A passive noise monitoring programme to be developed and address at least the following: • Recording of complaints procedure. • Method of selecting measurement localities; and • Method of measurement procedures. Listed activities must be monitored frequently to ensure compliance with the EMPr, EA, and closure plan. Records to be kept of monitoring activities. Vehicles/plant/equipment must be inspected on a regular basis. Records of these inspections must be kept.	1) ECO 2) Contractor's Environmental Representative (CEO) 3) Operator's Environmental Representative (OER) 4) Project Management	1) Recording of complaints. 2) Review of vehicle/plan/equipment maintenance plan as or when required. 3) Frequent inspections of vehicles/plant/equipment.
Cultural Heritage and Palaeontology				
• Site establishment (construction yard, offices, and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches) • Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant	Destruction of graves Degradation of cultural significance heritage site	Sites identified by Appendix K must be monitored frequently to ensure compliance with the EMPr, EA, and closure plan. If risks are manifested (accidental discovery of heritage resources) the chance find procedure should be implemented: • Cease all works immediately; • Report incident to Site Manager • EPC (Engineering Procurement and Construction) Contractor to contact an archaeologist/ palaeontologist to inspect the site; • Report incident to SAHRA; as advised by specialist and • Employ site specific mitigation measures recommended by the specialist after assessment in accordance with the requirements of the relevant authorities. Only recommence operations once impacts have been mitigated. A register (with GPS coordinates) to be kept of all identified sites. This register to be updated with photographic evidence recording the state of the features on a quarterly basis. Records to be kept of monitoring activities.	1) ECO 2) Contractor's Environmental Representative (CEO) 3) Operator's Environmental Representative (OER) 4) Project Management 5) Suitable accredited and qualified archaeologist	1) Weekly (Pre construction and construction phase)
Socio-economic				
• Employment of personnel during entire project life cycle • Procurement of construction materials and equipment during entire project life cycle	Increased employment opportunities Local economic development Reduced public safety Increased nuisance, disruption and indirect costs	Frequent monitoring of compliance with the Social Labour plan. A communications plan must be developed and should include: • An up-to-date database of all relevant stakeholders, including – public and private individuals, and community, businesses, and organisational representatives;	1) Company Directors 2) Human Resource manager 3) Project manager 4) SHEQ/ Health and Safety Manger 5) Community liaison officer	1) Review of Social Labour plan as required by legislation and the competent authority. 2) Review of grievance procedure as or when required. 3) Ongoing recording of complaints received by I&AP.

	Reduced access to livelihood resources Increased local economic stimulation opportunities	• Described method of communication for various scenarios including the frequency of communications (daily, weekly, ad hoc) and the means to be used (in-person, e-mail, phone call, text message, WhatsApp groups, notice boards, etc); • Consideration must be given to disadvantaged or differently abled stakeholders (e.g. illiterate, visually impaired, etc.) and social restrictions that may apply (e.g. gender roles); and • An indication of who is responsible for communication at each stage and according to each situation, including sender and receiver of each item. A grievance procedure to be developed and address at least the following: • An appropriate mechanism for stakeholder to report issues and complaints - A formal and accessible means of communications, including an electronic and physical (hard copy) procedure, such as a complaints telephone number (e.g. hot line), email address, physical address/site with a box for written complaints, and (if possible) a SMS/WhatsApp line for ease of submission and engagement; and • A formal record of all grievances – including recording, investigation, assessment, management and close out of all grievances. The Ergo Mining SEF Community Health and Safety management plan must at least include the following specific requirements: • Legal Context – namely South African laws and regulations governing public health and safety; • Organisation – including community resources (e.g. clinics, hospitals, community security measures, etc.), operator and contractor resources (e.g. site clinic, staff, financial provisions, private security, etc.); • Identification of potential impacts – as per the social impact assessment and other relevant reports; • Identification mitigation measures – including regular monitoring and reporting, auditing and review of measures, and communication with communities; • Roles and responsibilities – identification of who is responsible for what aspects of community health and safety and communications; and • Training and awareness – including community and staff awareness campaigns, including HIV, TB, and other communicable diseases. Listed activities must be monitored frequently to ensure compliance with the EMPr, EA, and closure plan. Records to be kept of monitoring activities.		
Health and Safety				

• Employment of personnel during entire project life cycle • Procurement of construction materials and equipment during entire project life cycle	Health and safety of employees and surrounding communities	The Ergo Mining SEF Community Health and Safety management plan must at least include the following specific requirements: • Legal Context – namely South African laws and regulations governing public health and safety; • Organisation – including community resources (e.g. clinics, hospitals, community security measures, etc.), operator and contractor resources (e.g. site clinic, staff, financial provisions, private security, etc.); • Identification of potential impacts – as per the social impact assessment and other relevant reports; • Identification mitigation measures – including regular monitoring and reporting, auditing and review of measures, and communication with communities; • Roles and responsibilities – identification of who is responsible for what aspects of community health and safety and communications; and • Training and awareness – including community and staff awareness campaigns, including HIV, TB, and other communicable diseases. Listed activities must be monitored frequently to ensure compliance with the EMPr, EA, and closure plan. Records to be kept of monitoring activities.	1) Company Directors 2) Human Resource manager 3) Project manager 4) SHEQ/ Health and Safety Manger 5) Community liaison officer	1) Review of Ergo Mining SEF Community Health and Safety management plan as or when required.
Traffic Management				
• Maintenance of access roads • Movement of construction vehicles • Movement of people	Construction vehicles and access roads Operation staff transportation trips, maintenance, and delivery trips	A traffic management plan must be developed and address at least the following: • Recommendations made in Appendix O; • Detailed route identification map indicating traffic directions and intersections; • Identification of roads requiring maintenance and maintenance plan; and • Monitoring of road intersections raised as a concern in the Traffic Assessment (Appendix O). Listed activities must be monitored frequently to ensure compliance with the EMPr, EA, and closure plan. Records to be kept of monitoring activities.	1) Health and Safety Manager/Officer. 2) Project management.	1) Review of traffic management plan as or when required.
Waste Management				
• Site establishment (construction yard, offices, and camps) • Clearing of vegetation at construction footprints: PV • Site clearing and topsoil stripping • Topsoil and subsoil stockpiling • Site preparation and earthworks • Excavation and trenching (foundations and cable trenches)	General waste generation & Littering Hazardous waste generation	A Waste management plan must be developed and address at least the following: • Identification of possible waste streams both hazardous and general; • Description of method to re-use, reduce, recycle, or avoid waste generation; • Monitoring requirements; • Quantification of waste streams; • Description of mitigation measures; and • Compliance with regulations stipulated in *TABLE 86*.	1) ECO 2) Contractor's Environmental Representative (CEO) 3) Operator's Environmental Representative (OER) 4) Project Management	1) Frequent inspection of on-site waste disposal facilities and sites. 2) Review of the Ergo Mining SEFPV Waste Management plan as or when required.

• Construction and maintenance of access roads • Movement of construction vehicles • PV infrastructure construction • Operation of the PV plant • Decommissioning & rehabilitation of the PV plant		On-going monitoring, reporting, and recording of all waste streams are required. Frequent inspections of waste disposal facilities or areas to take place. Records to be kept of such monitoring activities.		

l) Indicate the frequency of the submission of the performance assessment report

Regulation 55 of GN R. 527 (GG 26275 dated 23 April 204, as amended), requires the holder of a mining permit or mining right to conduct monitoring and performance assessments of the EMPr. This application is not for a mining right or permit but for an Environmental Authorisation, therefore Regulation 34 of GN R. 982 stipulates the requirements for auditing compliance with the Environmental Authorisation (EA), the EMPr, and the closure plan (in compliance with GN R. 1147).

It requires the holder of the authorisation, for the period during which the EA, EMPr, and closure plan are valid, to ensure compliance with all the conditions stipulated in these documents and that is be audited. This audit report must then be submitted to the competent authority.

This audit report must adhere to the following conditions:

- Be prepared by an ***independent*** person with the relevant environmental auditing expertise;
- Provide verifiable findings, in a structured and systematic manner, on- (i) the level of performance against and compliance of an organization or project with the provisions of the requisite environmental authorisation or EMPr and, where applicable, the closure plan; and (ii) the ability of the measures contained in the EMPr, and where applicable the closure plan, to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity;
- Contain the information set out in Appendix 7 of GN R. 982; and
- Be conducted and submitted to the competent authority at intervals as indicated in the environmental authorisation.

The purpose of this audit report is also defined in the regulations and is as follows:

- Determine the ability of the EMPr, and where applicable the closure plan, to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity on an ongoing basis and to sufficiently provide for the, avoidance, management and mitigation of environmental impacts associated with the closure of the facility; and
- To determine the level of compliance with the provisions of environmental authorisation, EMPr and where applicable the closure plan.

In the event that findings of the environmental audit report indicate insufficient mitigation of environmental impacts of the activity or insufficient levels of compliance with the requirements, the holder of the EA must submit recommendations to amend the EMPr or closure plan in order to rectify the shortcomings identified in the audit report.

The recommendations must be subjected to a public participation process which process has been agreed to by the competent authority and was appropriate to bring the proposed amendment of the EMPr and, where applicable

the closure plan, to the attention of potential and registered interested and affected parties, including organs of state which have jurisdiction in respect of any aspect of the relevant activity and the competent authority, for approval by the competent authority.

Within 7 days of the date of submission of an environmental audit report to the competent authority, the holder of an environmental authorisation must notify all potential and registered interested and affected parties of the submission of that report, and make such report immediately available:

- to anyone on request; and
- on a publicly accessible website, where the holder has such a website.

The environmental audit report must contain all information set out in Appendix 7 of GN R. 982.

It is recommended that this ***independent audit*** takes place on an ***annual basis*** or as specified by the competent authority in the EA, to promote continual improvement on the Ergo Mining SEF.

In terms of the definition of the regulations (GN R. 982), ***independent*** in relation to the person responsible for the preparation of an environmental audit report, means:

- That such person has no business, financial, personal, or other interest in the activity and is appointed in terms of the regulations; or
- That there are no circumstances that may compromise the objectivity of the person performing such work excluding fair remuneration for work performed in connection with the environmental audit report.

It is also recommended that an internal audit specified in the previous section be carried out on an annual basis, at least before the independent audit.

Compliance monitoring to be carried out as recommended in ***TABLE 91***.

m) Environmental Awareness Plan

General environmental awareness must be promoted among everyone working on the Ergo Mining SEF (including consultants and contractors) to encourage the implementation of environmentally sound practices throughout its duration.

This will ensure that environmental incidents are minimised and environmental compliance maximised.

The purpose of an Environmental Awareness Plan is to outline the methodology that will be used to inform the PV's employees of any environmental risks which may result from their work and the manner in which the risks must be dealt with in order to avoid contamination or the degradation of the environment. The awareness plan is primarily a tool to introduce and describe the requirements of the range of environmental and social plans for the

Project during the Life of the Project. The environmental awareness plan ensures that training needs are identified and appropriate training is provided.

The environmental awareness plan should at least communicate the following:

- Importance of conformance with the environmental policy, procedures and other requirements of good environmental management;
- The significant environmental impacts and risks of an individual's work activities and the environmental benefits of improved performance;
- Individual's roles and responsibilities in achieving the aims and objectives of the environmental policy; and
- The potential consequences of not complying with environmental procedures.

(1) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work

In order for the environmental awareness policy to be effective, the issues raised through it need to be communicated through training sessions, meetings, consultations and progress reviews. The following are recommended minimum steps that can be taken to ensure communication is effective:

- The agendas of all company board meetings will have an item where issues environmental projects are discussed and feedback is given;
- Provide progress reports on the achievement of policy objectives and level of compliance with the approved EMPr and the closure plan complying with GN R. 1147, to the DMR on request;
- Ensure environmental issues are realised at monthly PV management executive committee meetings and at all relevant, PV wide meetings, at all levels; and
- Ensure environmental issues are discussed at all general liaison meetings with local communities and other I&APs.

All employees are required to undergo environmental awareness induction training upon appointment and records of such training must be obtained and recorded. Refresher induction training must periodically take place.

Regular meetings (recommended to be done daily, at least once a week) communicating the following is recommended:

- Findings of environmental performance reports;
- Awareness raising campaigns discussing environmental topics; and
- Information of any environmental risk which may result from employee's work.

(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment

It is recommended that an awareness training schedule be developed. This schedule should at least indicate the following:

- Topic;
- Method of communicating i.e. through a workshop, training session, or meeting;
- Target group i.e. management, skilled or semi skilled labour, admin staff etc;
- Scheduled time; and
- Progress.

The following topics are recommended:

- Potential environmental risks;
- Legal requirements;
- EMS requirements;
- Environmental performance; and
- Environmental incidents addressing corrective and preventative measures to be implemented.

n) Specific information required by the Competent Authority

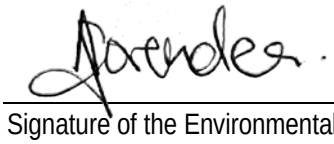
(Among others, confirm that the financial provision will be reviewed annually)

See section u) of Part A.

2) UNDERTAKING

Refer to Appendix R for a signed affidavit. The EAP herewith confirms:

- the correctness of the report accompanied by this declaration;
- the inclusion of comments and inputs from stakeholders and I&AP's;
- the inclusion of inputs and recommendations from the specialist reports where relevant; and
- the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed.



Signature of the Environmental Assessment Practitioner

Environmental Management Assistance (Pty) Ltd

Name of Company:

13 October 2022

Date

Reference List

Dimela Eco Consulting (2022) Ergo Solar Phase 2: Up to 40MW PV facility on the farm Witpoortje 117, Withok 131 and Withok Estates, Ekurhuleni Municipality, Gauteng Terrestrial Biodiversity (Vegetation) Assessment and plant Species Compliance Statement (Refer to Appendix E).

EIA Regulations (2014) National Environmental Management Act, 1998 (Act No. 107 Of 1998): Environmental Impact Assessment Regulations, 2014 (G38282 - R982 - 985) As Amended.

Envital (2022) Socio-Economic Impact Assessment Proposed Ergo Mining Solar (PV) Energy: Phase 2 (40MW) (Refer To Appendix N).

ERM (2017) Environmental Impact Assessment for a PV Solar Power Facility for Gold Field's South Deep Mine, Westonaria, Final Report, Gold Fields South Deep Mine.

Feathers Environmental Services (2022) Tshedza 3 Investments (Pty) Ltd 40MW Photovoltaic Solar Energy Facility (Phase 2) Avifaunal Impact Assessment Report. (Refer to Appendix G).

HCAC - Heritage Consultants (2022) Heritage Impact Assessment for the Proposed Construction of a Solar Photovoltaic (PV) Plant to Generate Up To 40 MW of Energy (Ergo Mining Solar Pv Energy Phase 2) Brakpan, City of Ekurhuleni Metropolitan Municipality, Gauteng Province (Refer to Appendix K).

Highlands Hydrology (Pty) Ltd (2022) Phase 2 Hydrological Assessment for the Proposed Tshedza 3 Investments (Pty) Ltd Development of a 40 MW Solar Photovoltaic And Associated Infrastructure Development, Gauteng Province (Refer to Appendix H).

Innovative Transport Solutions (2022 DRD Gold Phase 2 - Solar Energy Facility Transport Impact Assessment (Refer To Appendix O).

Kasl, B (2022). Tshedza 3 Investments (Pty) Ltd: Solar PV Project Phase 2 (40 MW): Gauteng Province Terrestrial Fauna Species Assessment (Refer to Appendix F).

LoGIS (2022) Visual Impact Assessment: Proposed Ergo Mining Solar Energy (PV) Projects Phase 2: 40MW Ekurhuleni Metropolitan Municipality, Gauteng (Refer To Appendix M).

Malachite Ecological Services (2022) Wetland and Desktop Aquatic Impact Assessment For An Environmental Impact Assessment Application For The Ergo Mining Solar PV Facility (Phase 2), with a Plant Capacity of 40MW, within the Ekurhuleni Local Municipality, Gauteng (Refer to Appendix I).

Malachite Ecological Services (2022 Soils and Agricultural Potential Impact Assessment for an Environmental Impact Assessment Application for the Ergo Mining Solar PV Facility (Phase 2), with a Plant Capacity Of 40MW, within the Ekurhuleni Local Municipality, Gauteng (Refer To Appendix J).

Prof Marion Bamford (2022) Palaeontological Impact Assessment for the proposed Ergo Mining Solar PV Phase 2 (40MW), Brakpan, Gauteng Province (Refer To Appendix L).

SolaSynergy (2021) Decommissioning Report for DRD ERGO Mine 20MWac, 22kV Overhead Power Line and Battery Energy Storage System (BESS) (phase 1) Solar Facility.