



SOCIO-ECONOMIC IMPACT ASSESSMENT

PROPOSED ERGO MINING SOLAR (PV) ENERGY: PHASE 1

July 2021

Final - Rev 1

Prepared for:



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EXECUTIVE SUMMARY

Tshedza 1 Pre Project Development (Pty) Ltd propose to construct a Photovoltaic (PV) facility and associated infrastructure capable of generating up to 20 MW, namely the Ergo Mining Solar (PV) Energy: Phase 1 (proposed project). The aim of the proposed project is to generate energy to supply the existing Ergo Mining Brakpan Plant and the Brakpan/Withok Tailings Dam facility with stable electricity during grid curtailments or outages.

Envital Consulting was appointed to undertake a Socio-economic Impact Assessment (SIA) in support of the environmental authorisation process for the development and operation of the proposed project. The scope of the SIA was to determine the potential positive and negative impacts on the local and regional socio-economic landscape. The study assessed the potential direct, indirect, and cumulative impacts (in relation to other activities), through the collection of primary data (limited field work) and relies of secondary data on the site and local socio-economic environment.

The proposed project aligns with the national integrated resources plan and municipal spatial development and integrated development plans. These policies promote the move to renewable energy and enable the energy sector to better support the local economy through economic incentives. The use of renewable energy will reduce the load on Eskom to supply the region, and thus open up supply for other sectors that may require it.

The proposed project site is located in Brakpan on the East Rand of Gauteng, spanning across in Wards 74, 82 and 99 of the City of Ekurhuleni metropolitan area. This area is within an urban area, but is characterised by peri-urban development, and comprises a combination of agricultural smallholdings, mining, and industrial land use.

The anticipated socio-economic impacts are likely to vary from local to the regional level, as the macro-economic benefits are likely to be realised on a regional level, while most of the negative impacts are anticipated to be localised. The area of direct impact of the proposed project is anticipated to be primarily within the smallholdings of Withok Estates Agricultural Holdings (AH) and Witpoort Estates AH, with immediately surrounding communities receiving indirect impacts.

Communities within the study area (within 2 km of the site) comprise a mix of income groups and activities, including middle- and low-income households, small-scale agriculture, and small or home-based businesses.

The key area of impact is anticipated to be within 500 m of the PV facility, specifically the properties located on Tenth Street in Withok Estates AH. The following key potential impacts were identified and assessed (with mitigation):

- ▶ Construction Phase
 - Increased employment opportunities (low, positive)
 - Increased local economic development opportunities (low, positive)
 - Reduced public safety (low, negative)
 - Increased nuisance, disruption and indirect costs (low, negative)
 - Reduced access to livelihood resources (very low, negative)
- ▶ Operational Phase
 - Increased employment opportunities (low, positive)
 - Increased local economic stimulation opportunities (low, positive)
 - Increased nuisance disruption and indirect costs (low, negative)
 - Reduced public safety (low, negative)

It is important to note that social impacts can be felt on an actual or perceived level, and therefore it is not always possible, or at least straightforward, to measure the impacts in a quantitative manner. The proposed project is unlikely to improve the overall socio-economic characteristics of the local

communities, however, will have the potential to provide individuals and households with an increase in employment, income and improved socio-economic conditions.

The No-Go Alternative is likely to maintain the status quo, which is positive for some neighbouring properties (maintaining sense of place) but would remove economic development opportunities through the construction and operation, including the use of renewable energy and supporting the Ergo Mining Plant operations.

The following key mitigation is recommended to manage the direct and indirect impacts of the proposed project:

- ▶ Design the facility to minimise visual impacts.
- ▶ Maintain access roads and prevent dust emissions and use of public roads.
- ▶ Communication Plan (Construction)– 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

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 manner in which the operations are carried out, however, must be done in line with best practice and consideration for socio-economic impacts. It is 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 Witpoort 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.

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ACRONYMS

AH	Agricultural Holdings
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Assistance (Pty) Ltd
IDP	Integrated Development Plan
NEMA	National Environmental Management Act (107 of 1998)
SIA	Socio-economic Impact Assessment
SMME	Small, Medium and Micro Enterprises
VAC	Visual absorption capacity

SPECIALIST REPORT REQUIREMENTS

A specialist report prepared in terms of Appendix 6 of the Environmental Impact Regulations of 2014 (as amended) must contain:

Requirement		Check (✓)	Report Reference / Comment
a	details of- (i) the specialist who prepared the report; and (ii) the expertise of that specialist to compile a specialist report including a curriculum vitae;	✓	Appendix A
b	a declaration that the specialist is independent in a form as may be specified by the competent authority;	✓	Appendix A
c	an indication of the scope of, and the purpose for which, the report was prepared;	✓	Section 1.3
(cA)	an indication of the quality and age of base data used for the specialist report;	✓	Section 2.2
(cB)	a description of existing impacts on the site,	✓	Section 3.4
	cumulative impacts of the proposed development and	✓	Section 5
	levels of acceptable change;	✓	Section 6.2
d	the duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	✓	Section 2.2
e	a description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	✓	Section 2
f	details of an assessment of the specific identified sensitivity of the site related to the proposed activity or activities and its associated structures and infrastructure, inclusive of a site plan identifying site alternatives	✓	Section 6.2
g	an identification of any areas to be avoided, including buffers;	N/A	
h	a map superimposing the activity including the associated structures and infrastructure on the environmental sensitivities of the site including areas to be avoided, including buffers;	✓	Section 6.2
i	a description of any assumptions made and any uncertainties or gaps in knowledge;	✓	Section 2.5
j	a description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	✓	Sections 4
k	any mitigation measures for inclusion in the EMPr;	✓	Section 7
l	any conditions for inclusion in the environmental authorisation;	✓	Section 7
m	any monitoring requirements for inclusion in the EMPr or environmental authorisation;	✓	Section 7
n	a reasoned opinion- (i) whether the proposed activity, activities or portions thereof should be authorised; and (iA) regarding the acceptability of the proposed activity or activities; and (ii) if the opinion is that the proposed activity, activities or portions thereof should be authorised, any avoidance, management and mitigation measures that should be included in the EMPr, and where applicable, the closure plan;	✓	Section 8
o	a description of any consultation process that was undertaken during the course of preparing the specialist report;	✓	Section 2.2
p	a summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	N/A	Confidential - Can be provide if required
q	any other information requested by the competent authority.	N/A	

1 INTRODUCTION

Tshedza 1 Pre Project Development (Pty) Ltd propose to construct a Photovoltaic (PV) facility and associated infrastructure capable of generating up to 20 MW, namely the Ergo Mining Solar (PV) Energy: Phase 1 (proposed project). The aim of the proposed project is to generate energy to supply the existing Ergo Mining Brakpan Plant and the Brakpan/Withok Tailings Dam facility with stable electricity during grid curtailments or outages.

In order to commence with the construction and operation of the proposed project, the proponent is required to apply for environmental authorisation in terms of the National Environmental Management Act (107 of 1998) and the Environmental Impact Assessment (EIA) regulations (2014, as amended).

Envital Consulting was appointed by Environmental Management Assistance (Pty) Ltd (EMA) to undertake a Socio-economic Impact Assessment (SIA) as part of the regulatory environmental authorisation process. SIA is an independent specialist study that focusses on the interrelation between social, economic, and biophysical environments, specifically the economic and social change process that can be induced by a particular activity or development.

1.1 PROJECT LOCATION

The proposed project will comprise the development of a PV facility and overhead 22 kV power lines. Both components are situated within the Withok Estates Agricultural Holdings (AH) area of Brakpan within the City of Ekurhuleni Metropolitan Municipality, Gauteng Province (**Figure 1**).

The PV facility is proposed to be constructed on property owned by Ergo Mining located 1 km south-west of the Ergo Mining Brakpan Plant. The site is currently comprised of open veld but was previously a tailings facility that was remined by Ergo Mining and closed in **2002**. The overhead lines are to run from the Ergo Mining Brakpan Plant located in **Witpoort Estates AH**, through the Withok Estates AH to the Brakpan/Withok Tailings Dam facility near Geluksdal.

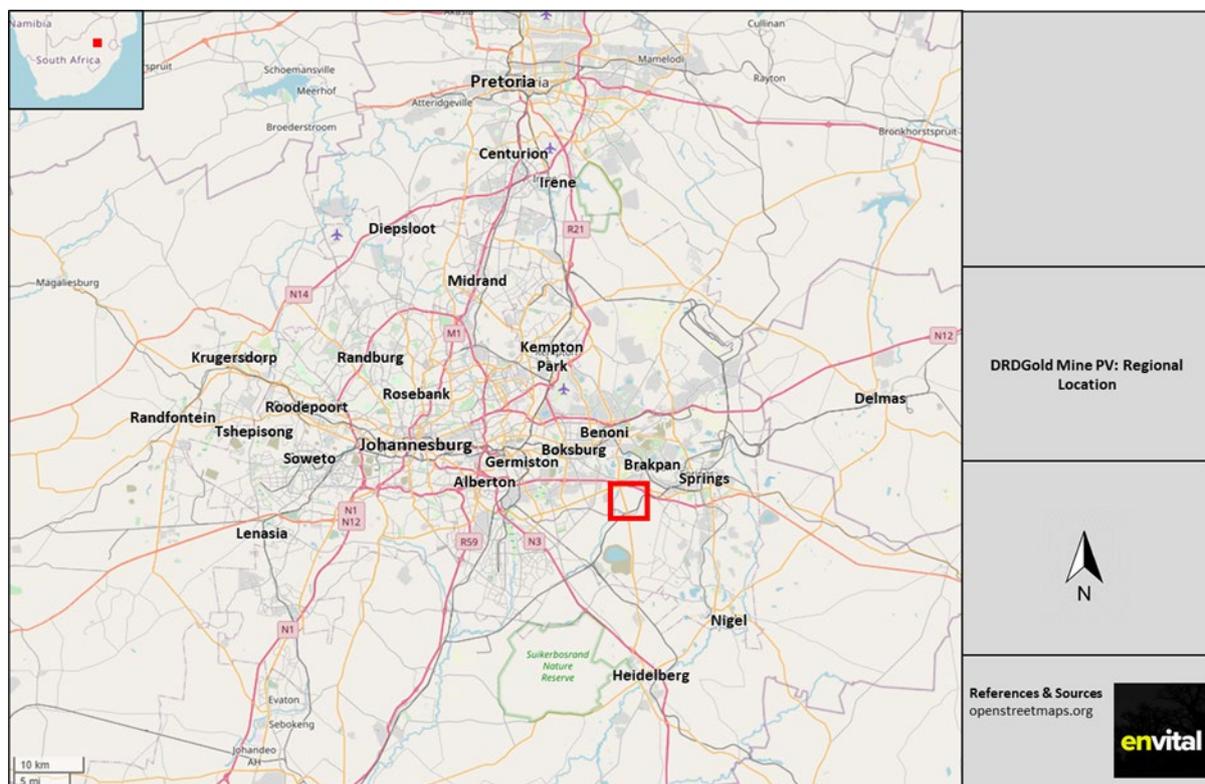


Figure 1 Location of proposed project site

1.2 PROJECT OVERVIEW

1.2.1 PURPOSE OF PROPOSED PROJECT

The purpose of the proposed project will be to secure energy supply for the Ergo Mining Plant and the Brakpan/Withok Tailings Dam facility. The energy for these facilities is currently supplied by Eskom via existing grid infrastructure, including overhead lines and substations in the immediate vicinity of these two facilities.

The proposed project will tie into the existing infrastructure, but supply energy to a purpose-built energy supply storage or battery system. This energy can then be used by the facilities in the event of grid curtailment or outages.

This is the first phase of a two-phase process to develop a 60 MW PV plant that will supply energy to the mining facilities, not only during interruption of supply, but with the long-term goal of reducing the carbon footprint and curtailing the use of energy supplied from the national grid. The second phase is subject to a separate environmental authorisation process and does not form part of this study.

1.2.2 ALTERNATIVE 1 (PREFERRED)

The proposed project is anticipated to comprise the construction, operation, and solar PV facility and associated infrastructure for the purpose of providing energy to the Ergo Mining Brakpan Plant and Brakpan/Withok Tailings Dam facility. A description of the key components is provided in **Table 1**.

Table 1 Overview of key activities

Activity	Description
PV panels	<ul style="list-style-type: none">- Design capacity: 19.98 MW AC (split over two sites)- Panel dimensions: 2.1m x 1.1m,- Panel height: 1.57m above ground- Area: 42 hectares (split between site adjacent sites of 17 ha and 25 ha)
Substations and electrical systems	<ul style="list-style-type: none">- Development of a new substation on the PV site,- Upgrade of existing Ergo Central 88/6.6kV substation at the mine, and the Ergo Transfer Pumps 88/11kV substation at the tailings dam.
Battery storage	<ul style="list-style-type: none">- 100 MWh containerized battery storage- Location: PV site adjacent to the site substation.
22 kV overhead power line	<ul style="list-style-type: none">- Pole height: 8 to 9 metres above ground.- Total length: 11 km- Route: From the PV facility battery storage system to two existing substations (Ergo Central and Ergo Transfer Pumps).
Access and security services	<ul style="list-style-type: none">- Upgrade of existing access road along slurry pipeline to the PV site with crusher run or similar materials (not paved), parallel to Tenth Street.- Appropriate lighting, fencing and access control around the PV site
Auxiliary services	<ul style="list-style-type: none">- Operational power supply and use -from existing Ergo Mining operations and onsite diesel generators.- Water supply and use – from existing Ergo Mining operations transported via tankers to site.- Waste management (private, existing)

The vacant land earmarked for the PV facility itself, which was previously mined and subsequently rehabilitated to its current naturally vegetated condition, is owned by the Ergo Mining Brakpan Plant and falls within the existing approved Mining Right Area. The preliminary basic site layout, including key operational areas, is provided in **Figure 2**.

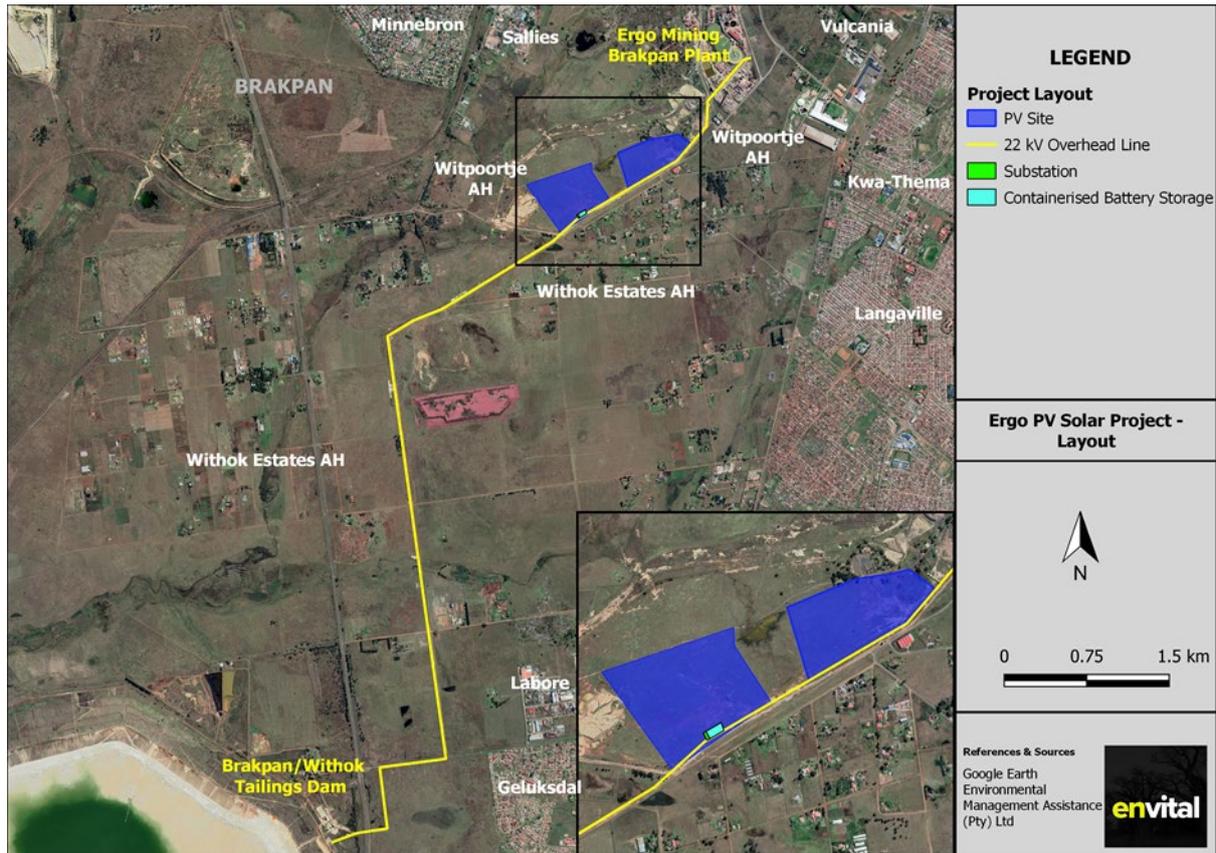


Figure 2 Preferred Site Layout

TIMEFRAMES

The site establishment and construction phase is anticipated to take approximately four months. The total life of the facility is anticipated to be over 20 years.

FINANCIALS

An overview of key financial aspects for the socio-economic environment are provided in **Table 2**.

Table 2 Overview of key financial aspects – approximate values

	Capital Value
Construction phase	R 237 432 038
Operational phase	R 2 783 850 / annum escalating at 6% per annum = R 36 693 356 over initial 10 years

LABOUR AND EMPLOYMENT

The estimated employment generated through the proposed project is provided in **Table 3**. The labour will be sourced regionally and from the local community (where appropriate skills exist or unskilled labour is required) in collaboration with the Ergo Mine Training Centre and Main Contractor (EPC) (Ergo, 2021).

The construction phase will see up to 120 people employed, with the majority (71%) being unskilled. The total capital value of employment is estimated at R 2 520 687 during construction, and R 2 378 908

per annum during operation. During the operational phase ten new employment opportunities will be generated for maintenance and oversight of the facility.

Table 3 Estimated employment positions generated

	Construction phase	Operational phase	Decommissioning
Management	4	1	2
Professional	3	1	
Skilled	22	2	4
Semi-skilled	11	4	-
Unskilled	85	6	40
TOTAL	125	14	46

1.2.3 ALTERNATIVE 2

The second alternative for the proposed project entailed the development of a 10 MW PV facility within a smaller footprint, as shown in **Figure 3**. All activities and services would be the same as those described in **Table 1**, with the exception of the PV panel footprint (5.6 ha).

The proponent determined that the 10 MW facility would not provide sufficient energy to meet current demands. The proposed development of a PV plant of up to 19.98 MW was determined to be a more feasible option from an investment and strategic perspective.

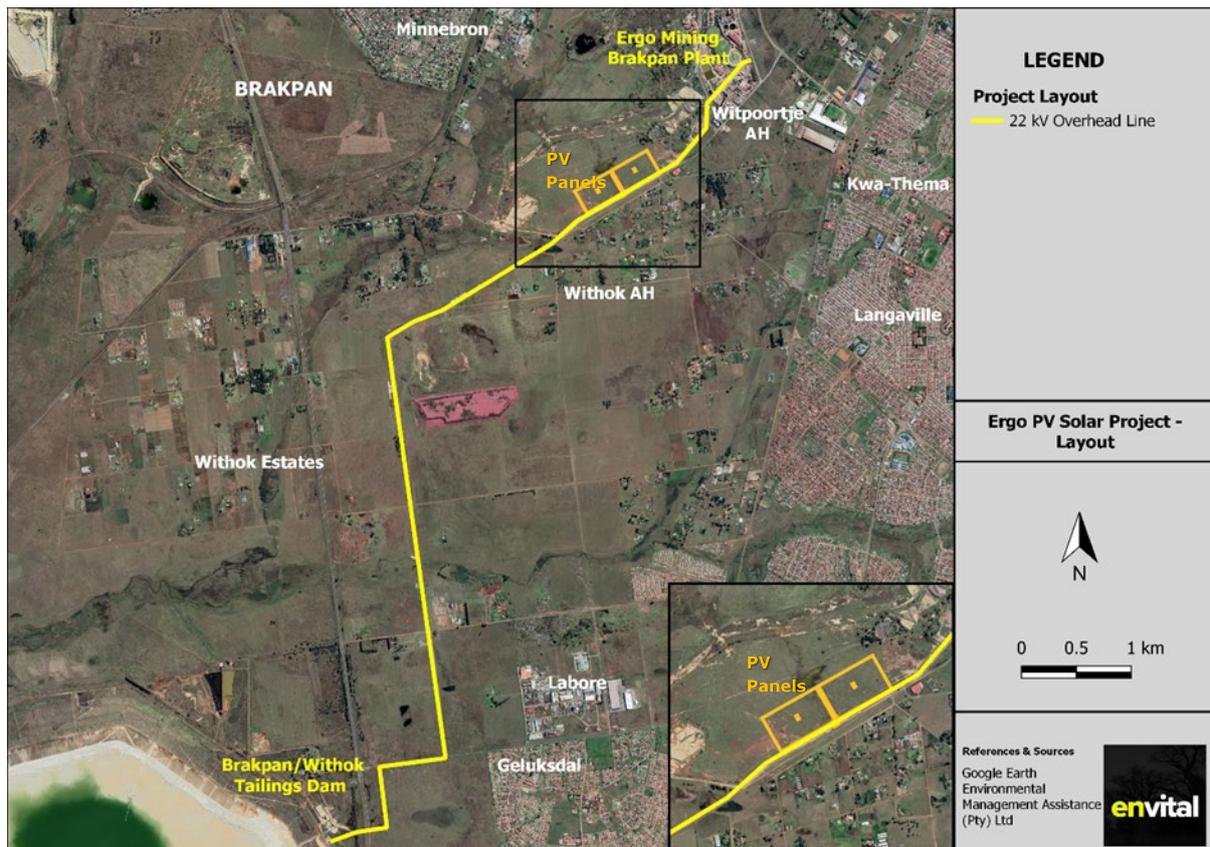


Figure 3 Alternative layout

1.2.4 THE 'NO-GO' ALTERNATIVE

The 'no-go' alternative, according to the current EIA Regulations, must be considered in situations where the proposed project will have a significant negative impact that cannot be effectively or satisfactorily mitigated against.

The no-go alternative refers to the option of not proceeding with the activity and ultimately the continuation of the current status quo. In other words, the Applicant does not undertake the development and operation of a photovoltaic power generation facility or any related activities on the site.

1.3 TERMS OF REFERENCE

The scope of the SIA was to determine the potential positive and negative impacts of the proposed project and alternatives, including the No-Go Alternative, on the local and regional socio-economic landscape. The study considered the direct, indirect, and cumulative impacts of the proposed project in relation to current and proposed activities within the local area.

The objectives of the SIA were to:

- ▶ Conduct a desktop review to develop a baseline of the socio-economic receiving environment associated with the proposed project;
- ▶ Conduct relevant field work to inform the socio-economic assessment process;
- ▶ Develop a social profile for the proposed project area through the description of the social receiving environment that may be affected by the proposed activity;
- ▶ Identify, describe, and assess the potential socio-economic impacts associated with the proposed project; and
- ▶ Provide mitigation measures and recommendations to enhance the socio-economic sustainability of all phases of the proposed project.

This report has been compiled in support of the Basic Assessment process undertaken by Environmental Management Assistance (Pty) Ltd.

1.4 SPECIALIST DETAILS

Danielle Sanderson is an independent, qualified specialist with thirteen years' experience in social and environmental impact assessment. Refer to **Appendix A** for declaration of independence and curriculum vitae of the specialist.

2 METHODOLOGY

2.1 APPROACH

The purpose of the SIA was to provide the socio-economic context for the proposed project and assess the potential impacts on the receiving socio-economic environment. The approach to this SIA study was informed by the scale of the proposed project within the local context.

The site is located on portion of land that was previously a gold mine tailings facility. This has been re-mined, and now comprises mostly disturbed grassland. The site is not secured (i.e. accessible to the public), and therefore is used by local residents as a crossing point (informal pathways) and for informal livestock grazing. The surrounding land use is a mix of industrial and agricultural smallholding (including small businesses).

The SIA process included a desktop assessment of background information for the site and project context, and limited field research, including interviews with key local stakeholders.

There is currently no specific legal framework that governs SIA processes in South Africa; however, a SIA study must meet the requirements for specialist reports in Appendix 6 of the National Environmental Management Act (107 of 1998). In addition, the International Association of Impact Assessment provides guidelines for assessing and managing the social impacts of projects (IAIA 2015). Both of the aforementioned frameworks have been used to inform this study.

2.2 DATA COLLECTION

The data collection phase of the study comprised of two components:

- 1) **Primary data** collection – field research; and
- 2) **Secondary data** collection – desktop research.

PRIMARY DATA

At the outset of the study, several sources of information were reviewed to identify the potentially affected communities and directly and indirectly affected stakeholders. These sources include:

- ▶ Stakeholder database and public participation process information; and
- ▶ Current maps and databases (e.g. Google Earth Pro, topographical maps, census data).

The focus of the study was on the communities adjacent to the proposed PV site (refer to **Section 2.4** for rationale). Primary data was collected during the site investigation from these and surrounding areas on **26 February 2021**. The following primary data was captured:

- ▶ **Observational data** was obtained about the site and surrounding land uses, characteristics and activities of the site and surrounding areas was undertaken by the specialist during the field work.
- ▶ **Interviews**
 - **Two property owners** adjacent to the proposed PV site on Tenth Street. There are approximately 10 properties (agricultural and industrial) on Tenth Street that are likely to be directly affected by the proposed PV site. Two property owners represents 20% of the directly affected properties.
 - **Interview with Ergo Plant Environmental Manager.**
 - Email and telephonic communication with a representative of the **Ekurhuleni Department of Social Development**

A meeting was scheduled with the Ward Councillor for Ward 82 (which includes the majority of the potentially affected properties and residents; however the meeting was delayed and could not be rescheduled within the timeframes of SIA study. The SIA specialist attempted to contact the Ward councillor for comments via telephone; however, as the project had not been formally

introduced to the Ward Committee through the public participation process, the councillor was not able to comment.

In addition a **review of the comments received through the public participation** was completed. The public participation process (legal requirements under NEMA) notified all properties immediate adjacent to the PV site and the overhead lines, as well as identified stakeholders in the broader local area (e.g. ward councillors and community organisations).

2.2.1 SECONDARY DATA

Several sources of secondary information were employed for the SIA. Firstly, the other specialist studies undertaken for the EIA process were reviewed, to identify potential socio-economic impacts resulting from the biophysical environmental impacts, including:

- ▶ Visual Impact Assessment (Du Plessis, 2021);
- ▶ Heritage Impact Assessment (Van der Walt, 2021); and
- ▶ Terrestrial biodiversity (vegetation) Assessment (Dimela ECO Consulting, 2021).

Other sources of information included current maps and databases (e.g. Google Earth Pro, topographical maps, census data), previous studies related to similar projects, municipal policy and planning reports, national strategic documents, and international journal articles and reports on similar projects.

2.2.2 DATA ANALYSIS

The information gathered through both the desktop assessment and field work was systematically collated and analysed using standard social science methods, including reduction, trend, and qualitative analysis. The key social issues were identified through a combination of understanding the current social and proposed environment, review of impacts of similar projects, and understanding gained through various specialists' studies. The potential positive and negative impacts associated with the proposed project were identified; following which a qualitative assessment of the priority socio-economic issues was conducted.

2.3 IMPACT ASSESSMENT

It is challenging to categorise social impacts, as they are often cross-cutting and multifaceted. In addition, not all impacts are perceived in the same way by all stakeholders or communities, and this perception may also change over time. Burdge and Vanclay (1996) state that:

“Certain impacts, such as changes to the nature or character of a community may be perceived as negative by some members of the community, and as positive by other members. Thus, impacts are not simply positive or negative in themselves... but are subject to the value judgements of individuals.”

Vanclay (2002) refers to the social change processes that can take place as a result of projects, including:

- ▶ Demographic processes: changes and impacts related to the composition of local communities;
- ▶ Economic processes: changes and impacts on the way in which the local people make a living and the economic activities in the society;
- ▶ Geographical processes: changes and impacts on land use patterns;
- ▶ Institutional and Legal processes: changes and impacts that affect the efficiency and effectiveness of local authorities; and
- ▶ Socio-cultural processes: changes and impacts that affect the culture of the local society, i.e. the way that people live together.

Not all social change process may, however, result in an impact. The social change processes are discussed broadly in **Section 4** and subsequently the impacts are assessed according to the applicability to the project and potentially affected stakeholders and communities in **Section 5**.

The SIA made use of a methodology that meets the combined requirements of international best practice and the National Environmental Management Act (107 of 1998) (NEMA) EIA Regulations of 2014, as amended. The SIA made use of a methodological framework based on a qualitative assessment of significance, using a structured definition of:

- ▶ Intensity of impacts
- ▶ Duration of impacts
- ▶ Extent of impacts
- ▶ Probability of exposure to impacts

The impact assessment strives to identify activities which require certain environmental management actions to mitigate the impacts arising from them.

Table 4 provides a description of the impact assessment process, including the definitions of criteria used to determine the significance rating.

Table 4 Definitions and Criteria for Impact Assessment

PART A: DEFINITIONS AND CRITERIA*			
Definition of CONSEQUENCE		Consequence is a function of intensity , spatial extent , and duration	
Definition of SIGNIFICANCE		Significance = consequence x probability	
		Social - negative	Social - positive
Criteria for ranking of the INTENSITY of environmental impacts Combination of Magnitude, Irreplaceability* of affected resource, and Reversibility** of impact	VH	Severe change, disturbance, or degradation. Associated with severe consequences. May result in severe illness, injury, or death. Targets, limits and thresholds of concern continually exceeded. Substantial intervention will be required. Vigorous/widespread community mobilization against project can be expected. May result in legal action if impact occurs. High Irreplaceability Low Reversibility	Substantial, large-scale change or improvement. Considerable and widespread benefit. Will be much better than the current conditions. Favourable publicity and/or widespread support expected. Low Irreplaceability High Reversibility
	H	Prominent change, disturbance or degradation. Associated with real and substantial consequences. May result in illness or injury. Targets, limits and thresholds of concern regularly exceeded. Will definitely require intervention. Threats of community action. Regular complaints can be expected when the impact takes place. Medium Irreplaceability Low Reversibility	Prominent change or improvement. Real and substantial benefits. Will be better than current conditions. Many people will experience benefits. General community support. Low Irreplaceability High Reversibility

	M	Magnitude - Moderate change, disturbance or discomfort. Associated with real but not substantial consequences. Targets, limits and thresholds of concern may occasionally be exceeded. Likely to require some intervention. Occasional complaints can be expected. Medium Irreplaceability Medium Reversibility	Moderate change or improvement. Real but not substantial benefits. Will be within or marginally better than the current conditions. Small number of people will experience benefits. Medium Irreplaceability Medium Reversibility
	L	Minor (Slight) change, disturbance or nuisance. Associated with minor consequences or deterioration. Targets, limits and thresholds of concern rarely exceeded. Require only minor interventions or clean-up actions. Sporadic complaints could be expected. Low Irreplaceability High Reversibility	Minor change or improvement. Minor benefits. Change not measurable/will remain in the current range. Few people will experience benefits. Low Irreplaceability High Reversibility
	VL	Magnitude - Negligible change, disturbance or nuisance. Associated with very minor consequences or deterioration. Targets, limits and thresholds of concern never exceeded. No interventions or clean-up actions required. No complaints anticipated. Low Irreplaceability High Reversibility	Negligible change or improvement. Almost no benefits. Change not measurable/will remain in the current range. Low Irreplaceability High Reversibility
Criteria for ranking the DURATION of impacts	VL	Very short, always less than a year. Quickly reversible	
	L	Short-term, occurs for more than 1 but less than 5 years. Reversible over time.	
	M	Medium-term, 5 to 10 years.	
	H	Long term, between 10 and 20 years. (Likely to cease at the end of the operational life of the activity)	
	VH	Very long, permanent, +20 years (Irreversible. Beyond closure)	
Criteria for ranking the EXTENT of impacts	VL	A part of the site/property.	National /International
	L	Whole site.	Provincial
	M	Beyond the site boundary, affecting immediate neighbours	Regional – local /district municipality
	H	Local area, extending far beyond site boundary.	Local / communities within the area of indirect impact
	VH	Regional/National	Affecting immediate neighbours / project area of direct impact
*Irreplaceability of resource caused by impacts	Low	No irreplaceable resources will be impacted (the affected resource is easy to replace/rehabilitate).	
	Medium	Resources that will be impacted can be replaced, with effort.	
	High	Project will destroy unique resources that cannot be replaced.	
**Reversibility of impacts	Low	Low reversibility to non-reversible.	
	Medium	Moderate reversibility of impacts.	
	High	High reversibility of impacts.	

PART B: DETERMINING CONSEQUENCE

EXTENT			A part of the site/property	Whole site	Beyond the site, affecting neighbours	Local area, extending far beyond site.	Regional/ National
			VL	L	M	H	VH
INTENSITY = VL							
DURATION	Very long	VH	Low	Low	Medium	Medium	High
	Long term	H	Low	Low	Low	Medium	Medium
	Medium term	M	Very Low	Low	Low	Low	Medium
	Short term	L	Very low	Very Low	Low	Low	Low
	Very short	VL	Very low	Very Low	Very Low	Low	Low
INTENSITY = L							
DURATION	Very long	VH	Medium	Medium	Medium	High	High
	Long term	H	Low	Medium	Medium	Medium	High
	Medium term	M	Low	Low	Medium	Medium	Medium
	Short term	L	Low	Low	Low	Medium	Medium
	Very short	VL	Very low	Low	Low	Low	Medium
INTENSITY = M							
DURATION	Very long	VH	Medium	High	High	High	Very High
	Long term	H	Medium	Medium	Medium	High	High
	Medium term	M	Medium	Medium	Medium	High	High
	Short term	L	Low	Medium	Medium	Medium	High
	Very short	VL	Low	Low	Low	Medium	Medium
INTENSITY = H							
DURATION	Very long	VH	High	High	High	Very High	Very High
	Long term	H	Medium	High	High	High	Very High
	Medium term	M	Medium	Medium	High	High	High
	Short term	L	Medium	Medium	Medium	High	High
	Very short	VL	Low	Medium	Medium	Medium	High
INTENSITY = VH							
DURATION	Very long	VH	High	High	Very High	Very High	Very High
	Long term	H	High	High	High	Very High	Very High
	Medium term	M	Medium	High	High	High	Very High
	Short term	L	Medium	Medium	High	High	High
	Very short	VL	Low	Medium	Medium	High	High
EXTENT			VL	L	M	H	VH

PART C: DETERMINING SIGNIFICANCE							
PROBABILITY (of exposure to impacts)	Definite/ Continuous	VH	Very Low	Low	Medium	High	Very High
	Probable	H	Very Low	Low	Medium	High	Very High
	Possible/ frequent	M	Very Low	Very Low	Low	Medium	High
	Conceivable	L	Insignificant	Very Low	Low	Medium	High
	Unlikely/ improbable	VL	Insignificant	Insignificant	Very Low	Low	Medium
			VL	L	M	H	VH
CONSEQUENCE							

*VH = very high, H = high, M = medium, L = low and VL = very low and + denotes a positive impact.

PART D: INTERPRETATION OF SIGNIFICANCE		
Significance	Decision guideline	
	Negative	Positive
Very High	Potential fatal flaw unless mitigated to lower significance.	Significant benefit and must for part of the basis for the decision.
High	It must have an influence on the decision. Substantial mitigation will be required.	It must have an influence on the decision.
Medium	It should have an influence on the decision. Mitigation will be required.	It should have an influence on the decision.
Low	Unlikely that it will have a real influence on the decision. Limited mitigation is likely to be required.	Unlikely that it will have a real influence on the decision.
Very Low	It will not have an influence on the decision. Does not require any mitigation	It will not have an influence on the decision.
Insignificant	Inconsequential, not requiring any consideration.	Inconsequential, not requiring any consideration.

2.4 STUDY AREA

The SIA focused on two levels in terms of study area, namely local and regional. Social and socio-economic impacts vary from the local to the regional, as specific properties, individuals and communities may be impacted locally, whereas regional impacts may affect broader communities, businesses and other economic and social aspects.

The study area focusses on the socio-economic landscape within 1 km of the proposed project footprint, as shown in **Figure 4**. Due to the nature and size of the proposed project, this study area encompasses most aspects that may be directly affected by the activities. The broader extent of the immediate area (>1 km) and regional context was also considered in terms of indirect socio-economic impacts, as described below.

2.4.1 LOCAL

The area that is considered to be “local” for the purposes of this study local area encompasses two study areas, namely the “Area of Direct Impact” and the “Area of Indirect Impact”, as described below.

AREA OF DIRECT IMPACT

Area of Direct Impact was defined as 500 m from the proposed PV facility site and 250 m from the overhead lines, as shown in **Figure 5**, and includes the social and economic activities closest to the site. This area was defined by the area likely to be directly impacted by the proposed project during construction through changes in the local environment (e.g. noise and dust emissions) and during operation through changes in the visual landscape and sense of place.

While the visual impact is likely to extend up to 1 km from the proposed PV site (Du Plessis, 2021), direct visual intrusion, which is likely to change the sense of place, is expected to affect the immediately neighbouring properties most severely. The reason is that these properties face the PV site (north-west), while houses further away generally face in other directions due to the orientation of the streets. In addition, noise, traffic, and reduced safety and security is likely to affect these houses more directly than houses or properties set further away within Withok Estates AH. 500 m is therefore considered an appropriate area to encompass the directly impacted properties.

The area of direct impact from the overhead lines is unlikely to extend beyond the area of visual impact, which is anticipated to with the 250 m from the overhead lines (Du Plessis, 2021). While the visual intrusion is likely to be the main aspect of concern for the overhead lines, 250 m is anticipated to

encompass potentially directly affected properties relating to other aspects such as noise and disruption during construction and safety and security concerns during operation.

AREA OF INDIRECT IMPACT

The Area of Indirect Impact was defined as the broader study area, which encompasses the socio-economic environment between the Area of Direct Impact and 1 km and approximately 10 km from the proposed project site (**Figure 6**). This area encompasses the broader Brakpan area, which may be impacted by aspects such as employment opportunities, and local economic development.

2.4.2 REGIONAL

The regional level is defined as the area which may be indirectly affected by the proposed project. The term “regional” in this study therefore refers to the City of Ekurhuleni Municipality and the Gauteng Province.

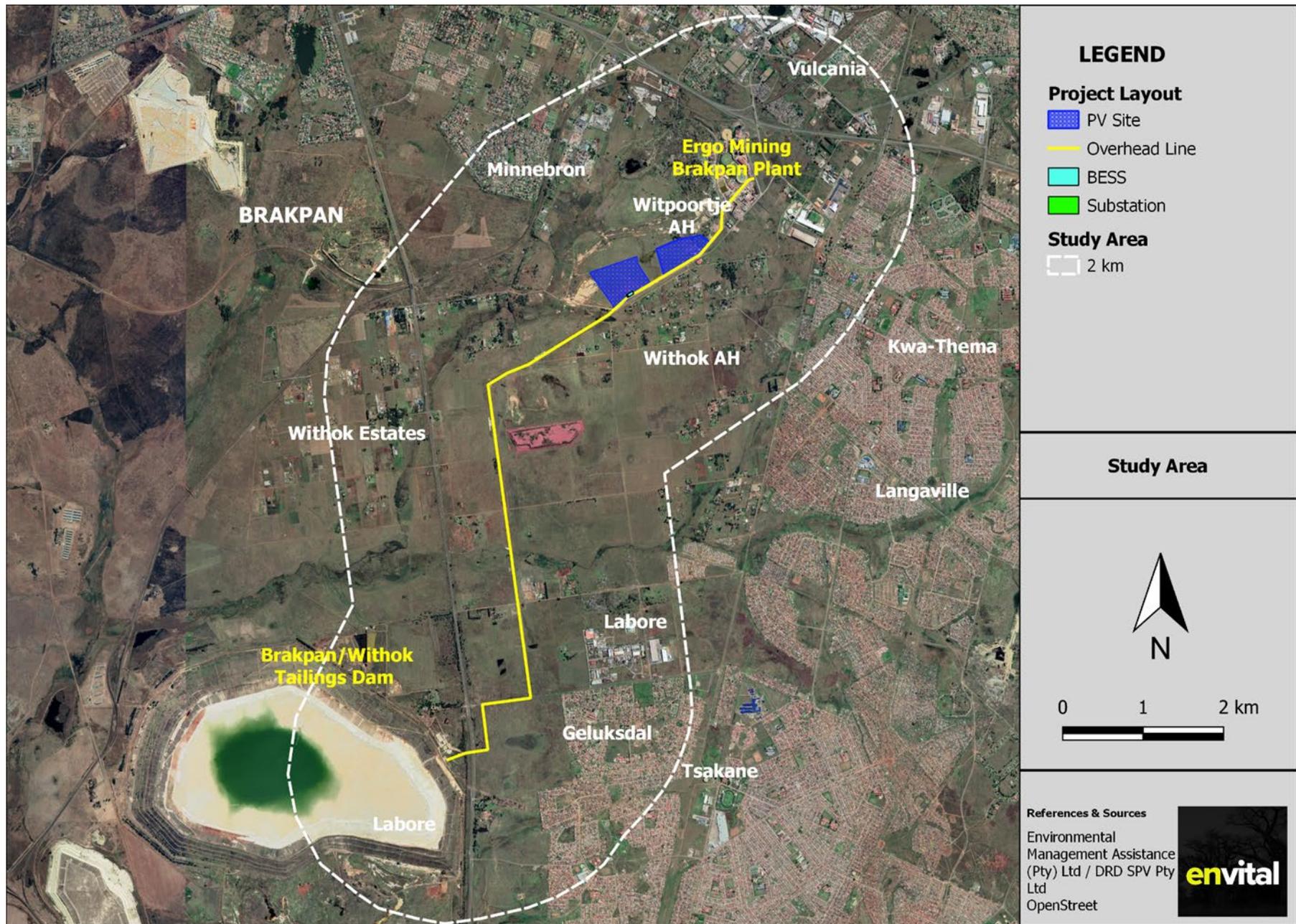


Figure 4 Study area – 2 km radius

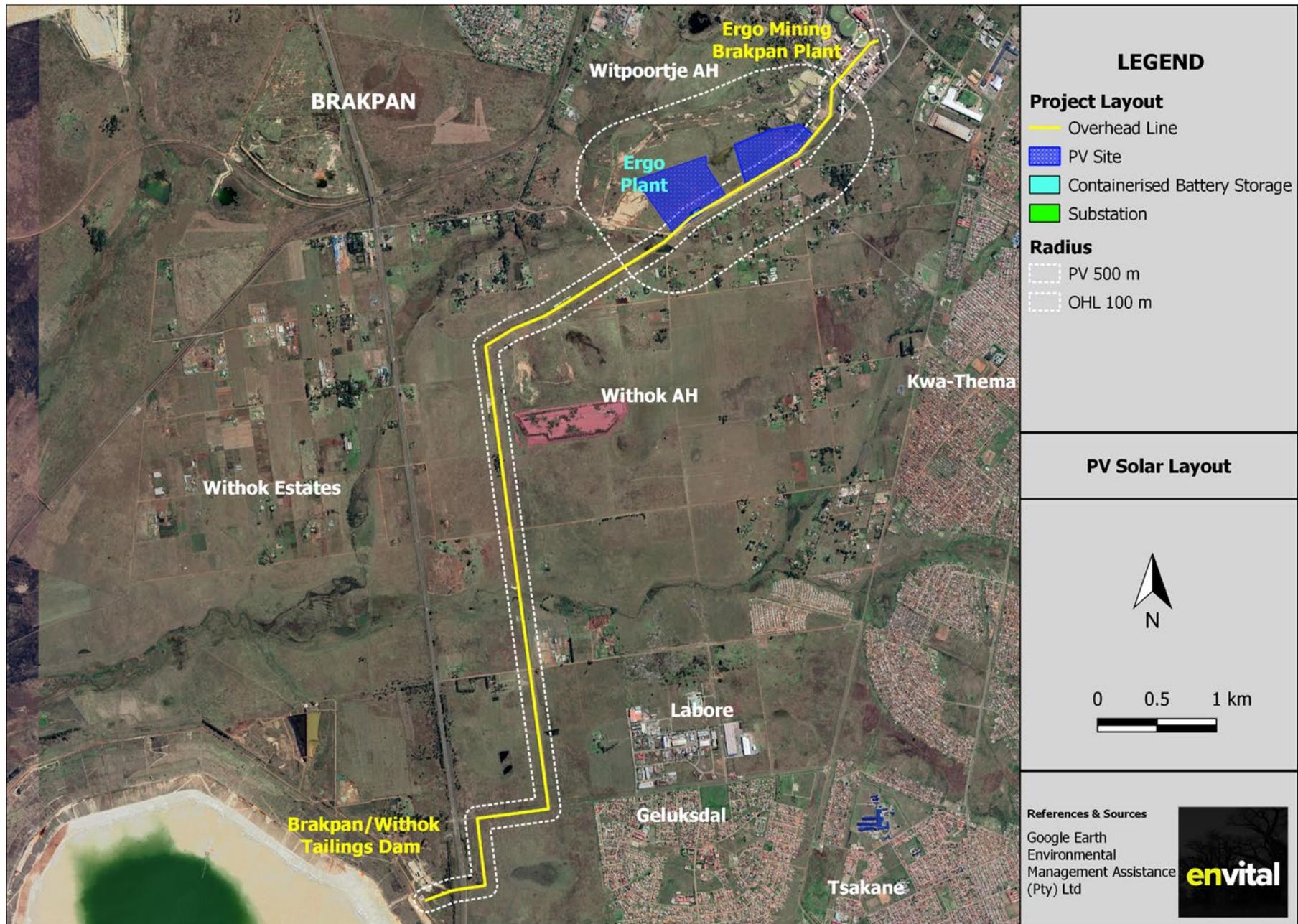


Figure 5 Area of Direct Impact

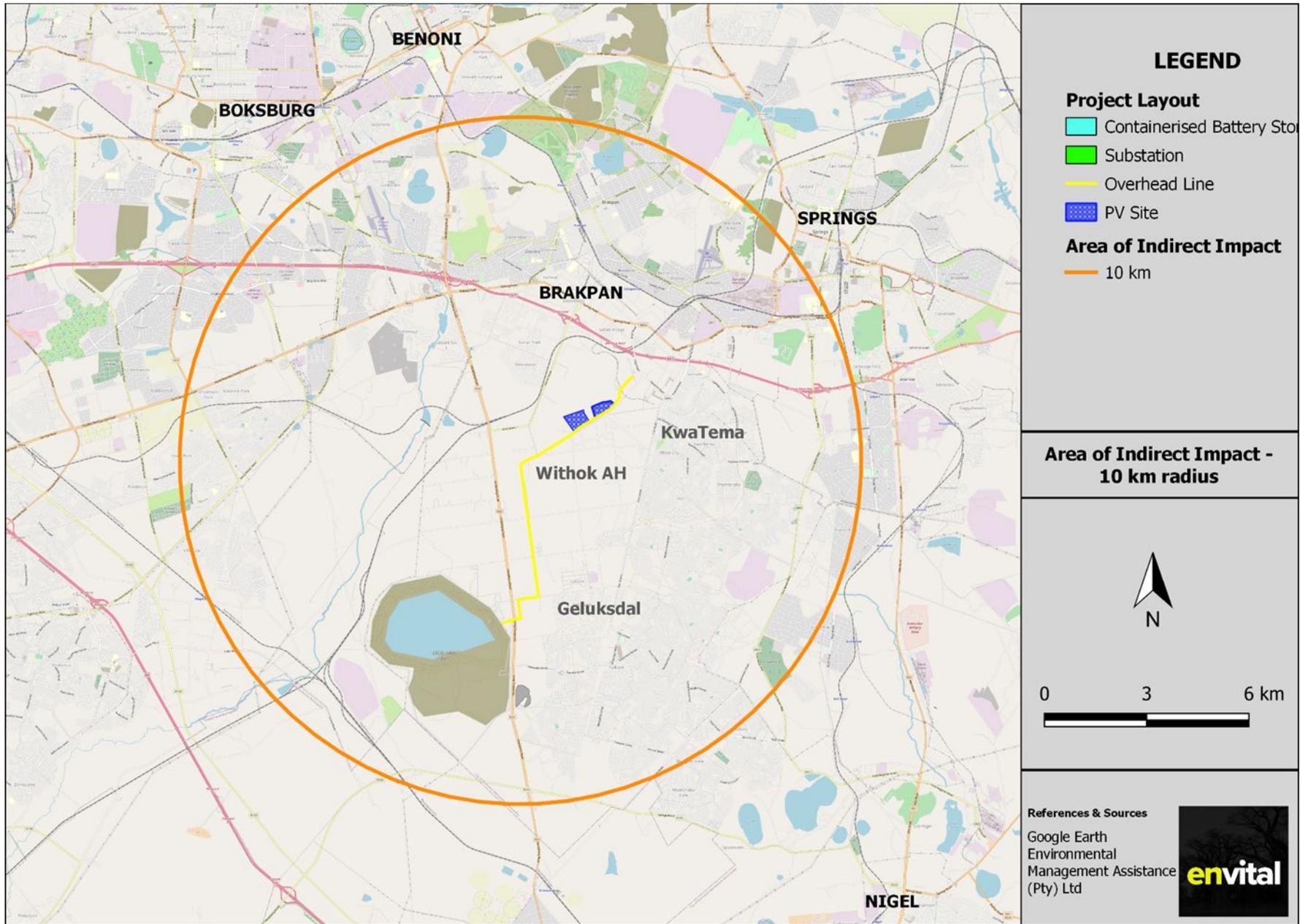


Figure 6 Area of Indirect Impact – 10 km Radius

2.5 GAPS, LIMITATIONS AND ASSUMPTIONS

GAPS IN DATA

- ▶ The site investigation was limited to a single day and telephonic interviews. Ideally the site investigation should have occurred over two days with sufficient time to set up appropriate meetings; however due to Covid-19-related restrictions, weather conditions at the time of the site visit (unable to access areas due to unpassable roads), and a delay in receipt of technical and public participation information (required prior to contact with stakeholders), the site investigation was restricted. Gaps were filled by contacting stakeholders by telephone where possible and review of public participation feedback.

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 12% of the open land used for informal grazing activities by local subsistence and emerging farmers will be removed by the proposed projects. Only one local farmer was interviewed, as he was willing to engage. 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.

3 RECEIVING ENVIRONMENT

3.1 REGIONAL OVERVIEW

The City of Ekurhuleni is one of three metropolitan areas in Gauteng, including the City of Tshwane and the City of Johannesburg. These three areas make up the administrative and economic capitals of South Africa. Unlike the other two cities, Ekurhuleni does not have a historical city centre. It was created through the amalgamation of two municipal areas and encompasses nine towns and seventeen townships that comprise the East Rand.

The lack of a single central business district and spatially fragmented economic and residential areas make the municipality a challenge to manage holistically (City of Ekurhuleni, 2016). These challenges include basic service delivery and planning, community health, and environmental monitoring.

In addition to this, there are four major concentrations of previously disadvantaged communities within the municipality due to the historical spatial separation of low-income, black-township areas from key economic areas within Gauteng. Collectively, these areas represent 61% of the municipality's population, and contribute to the high levels of poverty within Ekurhuleni (City of Ekurhuleni, 2016).

The population of Ekurhuleni is approximately 3.3 million people, which represents 6% of South Africa's population (Statistics SA, 2017). The growth rate of the population within Ekurhuleni is 2.47% (whereas nationally it is 1.2%) (City of Ekurhuleni, 2018). This growth is likely to be driven by the in-migration of people to the area. As with the City of Johannesburg and City of Tshwane, Ekurhuleni attracts a high number of jobseekers from areas outside of the city (e.g. rural areas, other provinces and neighbouring countries). The population of the municipality is largely concentrated in the young adult group (20-34 years of age). The in-migration of people may skew the demographics, as it is likely to be young adults who move to the area for work.

The majority (80%) of the population falls into the Black-African population group, followed by White (14%), Coloured (3%) and Indian (2%) (City of Ekurhuleni, 2018). The languages spoken reflect the diversity of people that migrate to the area. The mostly widely spoken first language is isiZulu (34%), followed by Sepedi (12%) Sesotho (11%) and English (10%) (City of Ekurhuleni, 2018).

Ekurhuleni is comprised of approximately 1.3 million households; 18% of which are considered informal (City of Ekurhuleni, 2018). The distribution of income per household is similar to Gauteng and the City of Johannesburg's, with 18% having no income, 21% low income, 32% low-middle, 2% middle-high and 4% high income (Statistics SA, 2012).

3.2 REGIONAL ECONOMY

The economy of Ekurhuleni is based predominantly on manufacturing, financial and business services, and community services and general government, which comprise 23%, 21% and 21% of the sector contributions respectively (City of Ekurhuleni, 2018). Other key economic activities include trade and hospitality (15%), and transport, storage and communication (11%) (City of Ekurhuleni, 2018).

There has been a notable shift in the economy of the municipality over the past 15 years, with a marked decline in manufacturing and increase in finance and businesses services (City of Ekurhuleni, 2018). This has created a significant issue for the City of Ekurhuleni, and revitalisation of the sector has become a key strategic focus (City of Ekurhuleni, 2018). This decline is likely to have affected the local economy for two reasons – firstly, employment (especially unskilled and skilled) is directly reliant on the manufacturing sector, and secondly, a loss of investment and income for the municipality.

A high portion of the population (48.5%) are economically active, however only 72.5% of this group are employed (City of Ekurhuleni, 2018). The unemployment rate of 27.4% is relatively high compared to the national rate of 24.5% in 2015, but similar to that of Gauteng at 27.6% (Statistics SA, 2016). This rate is likely to have increased significantly in 2020 with economic decline related Covid-19. Most employment within Ekurhuleni in 2015 was in three key sectors, namely trade (22%), finance (22%) and community services (19%), followed by manufacturing (13%) and construction (7%) (City of Ekurhuleni, 2018).

3.3 LOCAL OVERVIEW

The proposed project site is located in Brakpan on the East Rand, within Wards 74, 82 and 99 of the City of Ekurhuleni metropolitan area. The local area, however, encompasses a broader region of Brakpan.

3.3.1 LAND-USE

The site is located within an active gold mining area of the East Rand. There are several mining activities (mostly tailings facility and slimes dams) within a 5 km radius of the site. The closest urban centre to the site is Brakpan, which is located approximately 5 km north of the site, and Springs, which is located approximately 8 km north-east of the site.

Both Brakpan and Springs developed as a result of the coal and gold resources found in the area and associated mining and industry since the late 19th century. Today this area is characterised by a mosaic of mining and industrial land uses, interspersed with urban centres, residential areas, small-scale agriculture and open veld.

3.3.2 MINING AND RELATED OPERATIONS

The Gauteng region is known as the key mining area in South Africa, with gold and coal mining dating back to the late 19th century. The main mining corridor runs from east to west across the province, with Brakpan, Springs and Nigel forming the eastern and south-eastern extends (Ekurhuleni Metropolitan Municipality, 2015). Due to historic and ongoing mining, the landscape is littered with tailings and other waste dumps and dams. Numerous mining-related operations are found in the area, including associated engineering and related services.

Mining has therefore shaped the East Rand. Due to declines in recent years in this sector, however, business and government have looked to new means of economic sustainability within urban areas. One such means reclaiming of old tailing facilities for reprocessing, of which the Ergo Mining is one such operation. The Ekurhuleni SDF indicates that old mining areas are becoming focal points for the development of a variety of mixed uses, including active open space system for recreation and tourism to overcome social inequalities and provide more socio-economically sustainable and beneficial environments (Ekurhuleni Metropolitan Municipality, 2015).

3.3.3 INDUSTRY AND COMMERCIAL

The industrial and commercial aspects of the East Rand reflect the development around mining and subsequent socio-economic dynamics. Brakpan and Springs make up one of the seven industrial areas of the municipality and contribute significantly to the local economy.

There are several industrial areas within 10 km of the proposed project site, including Vulcania (1.7 km north), Vulcania South (<1km east), New Era (4 km north-east), and Boksburg East Industrial (9 km north-west). While much of the manufacturing in this area started as mining related, a wide variety of products are now produced here, from construction supplies and electronics to health care and food.

Transport and logistics is also a key component of the local services, as the location and space available in the area (outside of the densely developed City of Johannesburg) provides a good logistics hub.

Retail and other tertiary sector activities (consulting, financial) have developed in the area over the past few decades, as population and industrial activities have increased. There are several malls and offices parks in the area that support these activities.

3.3.4 DEMOGRAPHICS

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 7**) (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 8) (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 8).

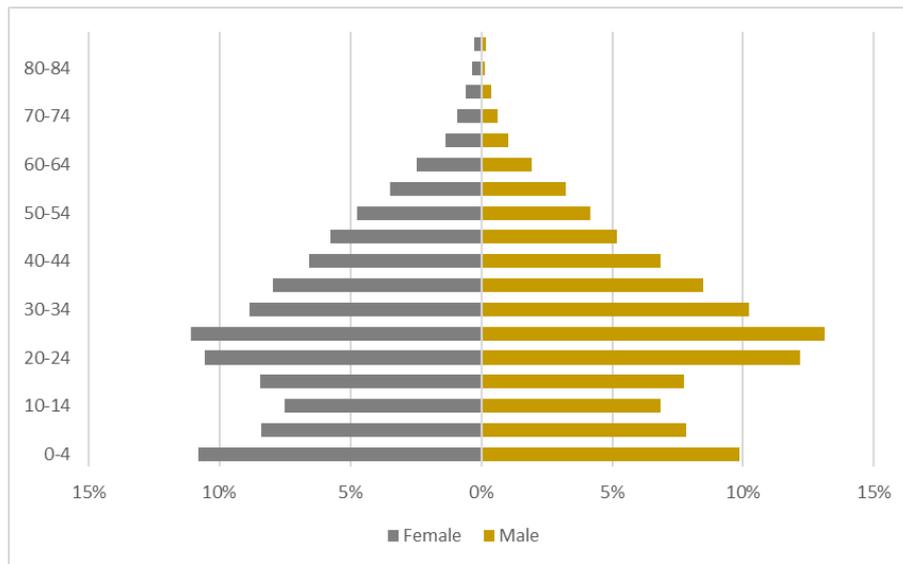


Figure 7 Population pyramid for Wards 74, 82 and 99

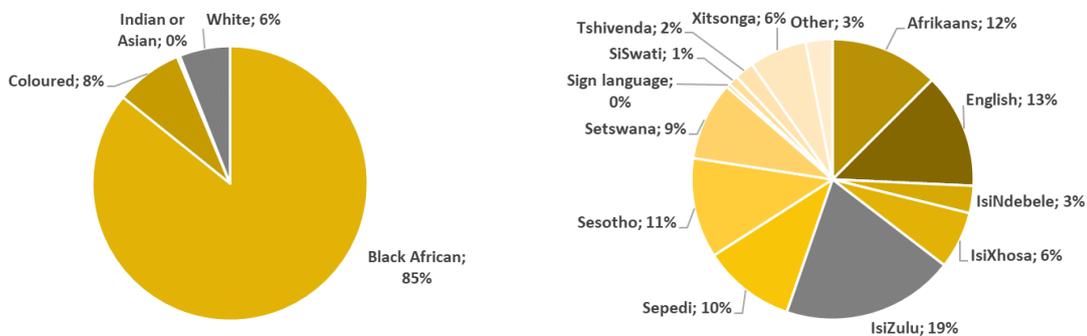


Figure 8 Population Groups and Languages for Wards 74, 82, 99

The local area is classified as urban and comprises 77% formal residential, 15% informal residential, 1% smallholdings and 1% industrial properties (Statistics SA, 2012)¹. The level of access to basic services is moderate and slightly lower than the Gauteng and Ekurhuleni Municipality averages. The key indicators for municipal service for the three wards are provided in Table 5 below.

¹ 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.

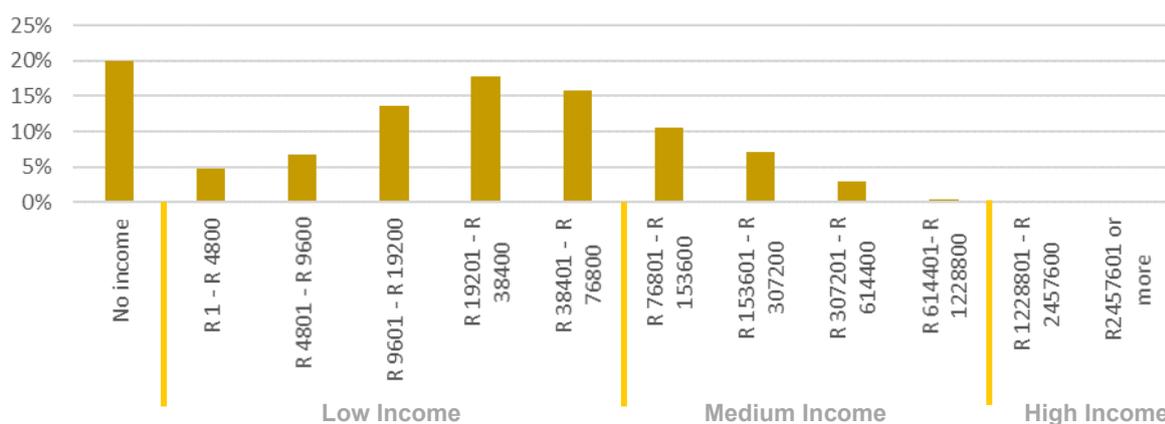
Table 5 Level of Access to Basic Services for Wards 74, 82 and 99

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%
	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 (See **Figure 9**).

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.



Source: Census 2011, Statistics SA 2012

Figure 9 Total Household Income Per Year - Wards 74, 82 and 99

3.4 SITE

3.4.1 LAND USE

The identified site on which the PV solar facility is to be located was previously a mine tailings facility, which has been re-mined (for processing) by Ergo Mining Brakpan Plant and naturally vegetated over the past twenty years (**Figure 10**). The site comprises open veld and is owned by Ergo Mining but is not secured and often accessed by members of the public who are moving between areas (informal pathways) and using the area for informal grazing of livestock.

The overhead powerline route is located partially on private land owned by Ergo Mining, along the existing slurry pipeline running from the Brakpan/Withok Tailings Dam facility in the south to the Ergo Mining Brakpan Plant in the north of the site. A large portion of the line crosses private and government-owned land (a total of 11 properties), which will require permission from the landowners to use.

The local area immediately surrounding the proposed project site comprises mostly formal smallholdings and vacant land or open veld. There are a number of residential and industrial areas in the vicinity, as outlined below.

INDUSTRY AND COMMERCIAL

Industrial and trade areas within the immediate vicinity of the proposed project site are included in **Table 6** and mapped in **Figure 10**.

Table 6 Summary of industrial areas within 2 km of the Proposed site

Residential Area	Distance & Direction from site	Broad characteristics
Sallies	450 m north-west	<ul style="list-style-type: none"> ▶ Transport and logistics ▶ Manufacturing - construction
Witpoort Estates AH	1.2 km north	▶ Manufacturing - construction
Denneoord	2 km north	▶ Automotive
Vulcania	2.2 km north north-east	▶ Transport and logistics, engineering
Vulcania South	1.5 km east	▶ Manufacturing - construction and personal products

RESIDENTIAL

There are various residential areas in the local area, ranging from low- to upper-income and formal in nature. Agricultural smallholdings overlap with industrial areas around the site.

There is one informal settlement, located north-east of the proposed project site. This is called the Ergo squatters and is likely to have developed as a result of mining and industrial-related employment opportunities in the immediate area.

An overview of each residential area is provided in **Table 7** and mapped in **Figure 10**.

Table 7 Summary of residential areas within 2 km of the Proposed site

Residential Area	Distance & Direction from site	Broad characteristics
Sallies	450 m north-west	<ul style="list-style-type: none"> ▶ Formal, smallholdings, some industrial/trade land use ▶ Low- to middle-income ▶ Basic Services
Minnebron	650 m north-west	<ul style="list-style-type: none"> ▶ Formal, small standalone properties with individual houses ▶ Low- to middle-income ▶ Basic Services
Sunair Park	1 km north north-west	<ul style="list-style-type: none"> ▶ Formal, mix of smallholdings and housing estates ▶ Middle-income ▶ Basic Services
Rand Colliers SH / Denneoord	2 km north	<ul style="list-style-type: none"> ▶ Formal, mix of smallholdings and housing estates ▶ Middle- to upper- income ▶ Basic Services
Sallies Village	1.5 km north north-east	<ul style="list-style-type: none"> ▶ Formal, small standalone properties with individual houses ▶ Low- to middle-income ▶ Basic Services
Ergo Squatters	1.7 km north-east	<ul style="list-style-type: none"> ▶ Informal, shanty town ▶ Low-income

Residential Area	Distance & Direction from site	Broad characteristics
		▶ Limited basic services (e.g. water)
Witpoort Estates AH	1.9 km north-east	▶ Formal, mixed smallholdings and industrial/trade ▶ Low- to middle-income ▶ Basic Services
Kwa Themba	1.7 km east	▶ Mixed formal and informal (back yard structures) ▶ Low-income ▶ Limited basic services (e.g. water)
Withok Estate	100 m south-east	▶ Formal, mixed smallholdings and industrial/trade ▶ Low- to middle-income ▶ Basic Services

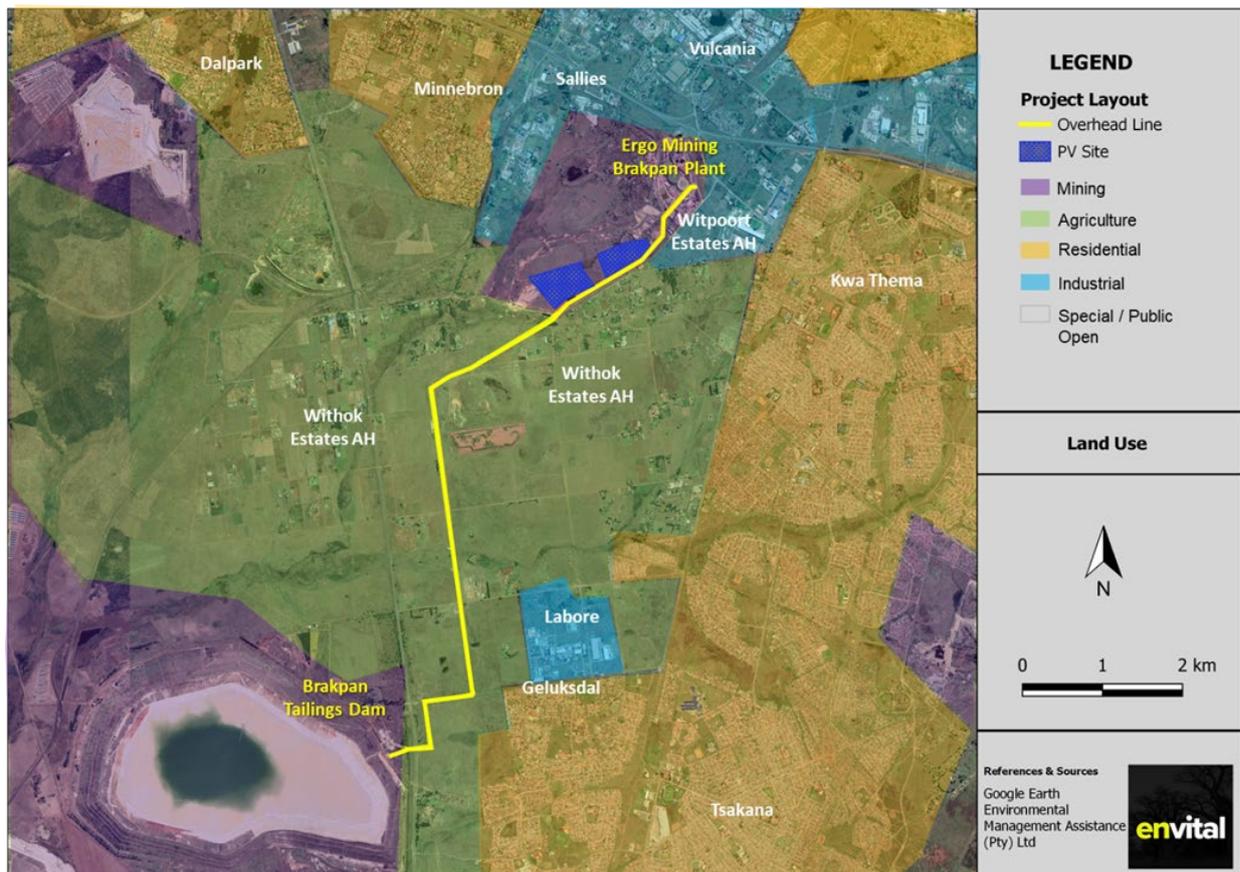


Figure 10 Broad land use near the proposed project site

3.4.2 SOCIAL AND POLITICAL STRUCTURES

The formal authority in this region is the regulated municipal structure, which means that a Ward Councillor and Ward Committee is responsible for representing and engaging with the local communities.

3.5 SOCIO-ECONOMIC POLICY AND PLANNING CONTEXT

3.5.1 NATIONAL POLICY

The national context of the SIA is based in the three key national pieces of legislation, which promote the social, economic, and environmental rights of South Africans, as described below.

CONSTITUTION OF SOUTH AFRICA (108 OF 1996)

The Constitution of South Africa, and specifically the Bill of Rights, gives South Africans the right to:

“an environment that is not harmful to their health or well-being; and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures”

This right is inherent in the EIA and SIA process, and underpins the needs to link the people to the environment in which they live, in terms of sustainable development and the right to healthy living environment.

The Constitution outlines the objectives and development duties of municipalities. As well as the legal rights of all South Africans.

There are two provisions within the Constitution that are of specific relevance for the SIA context, namely Sections 25 and 26. as provided below:

Section 25:-

“(1) No one may be deprived of property except in terms of law of general application, and no law may permit arbitrary deprivation of property.

(2) Property may be expropriated only in terms of general application – (a) for a public purpose or in the public interest; and (b) subject to compensation, the amount of which and the time and manner of payment of which have either been agreed by those affected or decided or approved by a court

(6) a person or community whose tenure of land is legally insecure as a result of past racially discriminatory laws or practices is entitled, to the extent provided by an act of Parliament, either to tenure which is legally secure or to comparable redress”

Section 26:-

(1) Everyone has the right to have access to adequate housing.

(3) No one may be evicted from their home, or have their home demolished, without an order of court made after considering all the circumstances. No legislation may permit arbitrary evictions.”

NATIONAL ENVIRONMENTAL MANAGEMENT ACT (107 OF 1998)

The National Environmental Management Act (107 of 1998) (NEMA) is the overarching national legislation in terms of environmental protection and management for sustainable development. The principles that are enshrined within the NEMA speak to the need to integrate people into environmental management and ensure equitable consideration of people within sustainable development. The following NEMA principles highlight the need to include social impacts within integrated environmental management:

- ▶ Equitable access to environmental resources, benefits, and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination.
- ▶ Community wellbeing and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means.
- ▶ The social, economic, and environmental impacts of activities, including disadvantages and benefits, must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
- ▶ The costs of remedying pollution, environmental degradation, and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.
- ▶ The vital role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted.

The social aspects of the NEMA principles include equality, meeting basic human needs, and identifying social and economic impacts of development. The aims and objectives of the SIA study are to ensure these aspects are considered as part of the EIA and decision-making process.

ENERGY-SPECIFIC POLICY AND LEGISLATION

On a national level, legislation and policy around the development and use of renewable energy in South Africa is crucial to understanding the context and potential impacts and implications of the proposed project.

The following national-level policies were reviewed to provide context for the proposed project in terms of the production of renewable energy:

- ▶ Integrated Resource Plan (2010/2019)
- ▶ National Development Plan of 2030
- ▶ National Infrastructure Plan of South Africa;
- ▶ New Growth Path Framework;

The findings of the review process were that renewable energy is a key element in the sustainable growth of the South African economy. In addition to the economic benefits, including energy supply stability, it also will provide an opportunity to reduce the carbon emissions and promote the green economy within the country.

While the proposed project is anticipated to generate electricity for private use (i.e. for Ergo Mining Brakpan Plant and Brakpan/Withok Tailings Dam facility) and not to feed into the grid and support broader socio-economic development, the use of renewable energy for the operations is likely to allow for energy produced through coal to be diverted to other sectors or uses, and therefore contribute toward local renewable energy production and provide broader support as a result.

In response to an increasing need for energy for industry and economic development across South Africa, the national Department of Energy initiated the renewable energy policy to subsidise the existing coal-fired energy production, which currently dominates South Africa's energy production. As a result, the Renewables Energy Feed-in Tariffs (REFIT) policy was developed and the National Integrated Resource Plan (IRP) and Integrated Resource Plan (IRP2010), incorporating the Renewable Energy Independent Power Producer (REIPP) Procurement Process. This process was initiated in 2009 to contribute towards the target of 10,000 gigawatt hours (GWh) of renewable energy supply by 2030.

An integral part of the renewable energy policy is the socio-economic benefits associated with the development of renewable power generation plants, which include:

- ▶ Improved human and ecosystems health as a result of reduced pollution and climate conscious and sustainable development
- ▶ Secure energy supply for social services centres, schools, clinics, telecommunications, small businesses and other such facilities vital for poverty alleviation and socio-economic development
- ▶ Allowing for an equitable platform for Independent Power Producers (IPPs) to qualify for the generation of renewable energy
- ▶ Employment opportunities for local communities
- ▶ Opportunities for local economic development, with 45% local content (as per qualifying criteria for the third phase of IPP procurement process)

In addition the following relevant legislation was considered:

- ▶ **The National Energy Act no 34 of 2008** which promotes the diversification of the supply of renewable energy and its sources, including the development of solar, in the support of economic growth and poverty alleviation.
- ▶ **White Paper on the Energy Policy of the Republic of South Africa of 1998**; which indicates that the government has committed to "the promotion of access to affordable and sustainable energy services for small businesses, disadvantaged households, small farms, schools, clinics, in our rural areas and a wide range of other community establishments".

- ▶ **White Paper on Renewable Energy of 2003**; supports the White paper on Energy Policy and sets out the government’s vision, policy principles, strategic goals and objectives for promoting and implementing renewable energy in South Africa.

3.5.2 LOCAL

SPATIAL DEVELOPMENT FRAMEWORK

The Ekurhuleni Metropolitan Spatial Development Framework (SDF) (Ekurhuleni Metropolitan Municipality, 2015) identifies the springs and Brakpan areas as existing nodes that require infrastructure and services upgrades, infill, and improved transport linkages to develop their potential and meet the future requirements of the municipality’s development planning. This comes from a number of broader spatial planning policies, including the National Development Plan and Global City Region Concept.

The National Development Plan identifies the need to overcome spatial and economic exclusion by developing logistics hubs, road, rail, fuel and other infrastructure through+* the development of key areas, which includes the Tambo Springs Logistics Gateway. The Tambo Springs Logistics Gateway consists of a central logistics hub in Gauteng, that is supported by several decentralised nodes and corridor. In Springs, there are four hubs planned for development (including manufacturing, logistics, and warehousing).

The Global City Region Concept was developed to build Gauteng into an integrated and globally competitive region where the economic activities of different parts of the province complement each other in consolidating Gauteng as an economic hub of Africa and an internationally recognised global city region. The key principles include “Reducing present rates of non-renewable energy usage”.

Ekurhuleni is a key industrial area for Gauteng and South Africa, and so needs to ensure efficient and continuous industrial growth (Ekurhuleni Metropolitan Municipality, 2015). The regeneration of the far East Rand (including the Springs/Brakpan areas) is identified as one of the key aspects. This in turn supports strategic objectives of the Tambo Springs Logistics Gateway and other needs, such as road, rail and industrial, commercial and residential infill and development.

In addition to industrial development, one of the key objectives and indicators for spatial development within the Ekurhuleni Municipality is to “identify the spatial impact of climate change” by enabling the energy sector to better support the local economy (Ekurhuleni Metropolitan Municipality, 2015). This can be achieved by:

- ▶ Increasing renewable and clean energy contribution to the total energy supply mix;
- ▶ Energy planning to include full economic cost of energy; and
- ▶ Providing incentives for increased energy efficiency and use of renewable energy.

The development of industrial operations within the local area relates to the ongoing development and support of existing operations, including mining, within the local area. The SDF indicates that Tambo Springs development could potentially increase energy demand in the region. The support of the development in the region, as well as the promotion of the development and use of renewable energy is key for the proposed project, and therefore is considered aligned with the SDF.

The proposed project must also consider the potential for future development and infilling of housing and industrial activities in the area south of Springs, which could potentially affect the future surrounding land uses.

EKURHULENI INTEGRATED DEVELOPMENT PLAN

The City of Ekurhuleni Integrated Development Plan (IDP) (Ekurhuleni, 2018) aligns national and provincial development strategies with municipal and localised requirements. The IDP provides several strategic objectives for the Ekurhuleni Growth and Development Strategy (GDS 2055) and to develop and implement the IDP. These objectives are:

- ▶ To promote integrated human settlements through massive infrastructure and services rollout;

- ▶ To build a clean, capable and modernised local state;
- ▶ To promote safer, healthy and socially empowered communities;
- ▶ To protect the natural environment and promote resource sustainability; and
- ▶ To create an enabling environment for inclusive growth and job creation.

To align the IDP with strategic processes, key focus areas are identified. One of the aspects is to “protect the natural environment and promote resource sustainability”, with the focus of implementing the alternative and renewable energy strategy to limit dependence on the national grid” (Ekurhuleni, 2018).

The City of Ekurhuleni has experienced challenges with regards to energy provision, and the alternative and renewable energy strategy focusses on providing small-scale and individual renewable energy solutions for municipal and state-sponsored operations, initiatives, and low-cost housing.

The proposed project is not directly highlighted in the IDP as it is for private industrial use, however the IDP supports the production of solar energy in support of broader provincial and national strategies to reduce carbon emissions and move towards cleaner energy sources.

4 FINDINGS

4.1 SOCIO-ECONOMIC NEED AND DESIRABILITY

There are two aspects of the proposed project that are likely to have dual socio-economic outcomes, namely:

- 1) Securing energy supply for the Ergo plant and Brakpan/Withok Tailings Dam facility; and
- 2) Indirect socio-economic benefits through the development of renewable energy.

4.1.1 SECURING ENERGY

The short to medium-term goal of the project is to obtain a secure energy supply for the Ergo Mining to ensure operational capacity during grid supply curtailment and interruptions. Currently operations are affected by the ongoing load shedding and interruptions from Eskom. This is assumed to affect 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 unscheduled shutdowns) potentially large-scale issues that could lead to the closure of the facility.

The Ergo Plant has been operation since 1977 (although closed between 2005 and 2007) and has a 25.2 Mt annual capacity. The Ergo Plant currently employs a 437 people and associated facilities. The ongoing increase in disruption to energy supply from Eskom and rapidly increase prices is predicted to result in the downscaling and closure of many mines in South Africa (Minerals Council South Africa, 2021). This could result in loss of jobs and impact service providers and result in other losses in the supply chain. In addition, the broader economic revenue generated by the business could be affected, resulting in regional economic impacts. Therefore, without securing the energy requirements for the plant, there is the potential for local and regional socio-economic impacts.

4.1.2 USE OF RENEWABLE ENERGY

The proposed use of alternative power for securing energy for the plant will first reduce the load on Eskom 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.

During the second phase of the solar PV project, an additional 50 MW of PV capacity is intended to be added to the PV facility proposed in this study. 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.

4.2 FACTORS AFFECTING LOCAL PARTICIPATION IN THE PROJECT

The local communities within the study area are generally considered apathetic around civil issues in terms of the Ergo Plant and associated activities. There are, however, a number of self-appointed role players within these communities that raise issues with Ergo Mining on occasion. The lack of formal structure within communities means that the communities could not be engaged with directly.

The SIA process ensured that some of these role players were engaged, but the level of their representation in terms of the community issues and aspirations is not necessarily equitable and comprehensive.

4.3 SOCIAL RISKS

Social risk are aspects of the socio-economic receiving environment (including local and regional communities or stakeholders). There is some level of a social risk to any project of scale associated

with mining activities. Even though the proposed project is not mining in itself, the association with historical and current mining operations could pose a risk to the operational or financial viability of the project, or the owner or operator. The following risks have been identified for the proposed project.

4.3.1 SOCIAL LICENSE TO OPERATE

The Social License to Operate is an informal social contract for the ongoing acceptance of a project or activity by stakeholders, and the general public. In order to build social license, the proponent must ensure that they are managing and meeting the expectations of the host community (the community that is directly affected by the operational activities) and other stakeholders and prevent discontent and unrest. Loss of social license is usually a result of poor or late engagement, and a lack of transparency and understanding of the local context by the proponent.

Local communities may raise grievances such as disruption to the local environment, including noise, dust, health and safety, and a lack of local economic development and/or community investment projects. Whether these aspects are perceived or actual, the acknowledging, addressing and managing impacts on local communities can assist with maintaining “social license” or informal approval for the project.

4.4 PERSPECTIVES ON THE PROPOSED PROJECT

A summary of the key issues raised by stakeholders captured through interviews by the specialist and through the public participation process are outlined in **Table 8**. Further details on these aspects are provided in the sections following. It should be noted that the public participation process was not completed prior to this SIA study.

Table 8 Key stakeholders and socio-economic issues identified

Stakeholder	Key issues raised
Local residents – Tenth Street, Withok Estate AH	<ul style="list-style-type: none"> ▶ Noise: <ul style="list-style-type: none"> – From construction activities – From vehicles and transformers ▶ Visual impact: <ul style="list-style-type: none"> – What will the area look like? – It might affect rentals on my property ▶ Safety and Security: <ul style="list-style-type: none"> – People coming into the area during construction – People coming to steal high-value components or cables – Will divert people who use the open veld to walk through closer to the houses ▶ Health and safety: – will the plant produce anything that will affect us ▶ Lighting at night: – might affect birds and other species ▶ Roads: – the Ergo security and maintenance vehicle use the public road and not the service road along the pipeline – when this project happens, they will use the public road even more and cause dust and break up the road ▶ Change the nature of the area: - live here because it is peaceful and quiet, and this project will change that ▶ Community benefits: <ul style="list-style-type: none"> – What will the benefits to the community be? – Jobs should be given to local people, as there are many in need of jobs who have skills ▶ Grazing and subsistence agriculture: <ul style="list-style-type: none"> – Do not think it will impact people grazing in the area – not the formal plots
Other Withok Estate Residents – Captured through public	<ul style="list-style-type: none"> ▶ Positive impacts <ul style="list-style-type: none"> – What positive impacts will there be on Withok Estate residents ▶ San Michele Home

Stakeholder	Key issues raised
participation process	<ul style="list-style-type: none"> - What impact will there be on the 203 mentally challenged residents and 96 staff ▶ Vulcania - What impact will there be on farm/property

4.4.1 SENSE OF PLACE

The sense of place of an individual or community is the “affective bond between people and a place or setting” (Tuan, 1974) and includes the subjective perceptions of the environment and reaction to the environment (e.g. enjoyment of the tranquil, rural nature of an area) (Hummon, 1992).

The area immediately surrounding the proposed project site is characterised by agricultural smallholdings, mine tailings facilities, commercial operations and open veld (**Figure 11**). The landscape therefore has a semi-industrial, peri-urban sense of place. The industrial and mining activities that are scattered around the area are not dominant, but intrude moderately on the landscape, mainly through visual and noise disturbance, as well as creating an overall less-desirable area for residential land uses (i.e. lower property values).



Figure 11 Houses along Tenth Street

The residents and businesses in this area are likely to have located here for a number of reasons, including cost of land, size of plots available, and access to social and commercial resources. The backdrop of industrial and mining activities has therefore become an accepted part of living in the area.

The overhead lines are likely to assimilate into the landscape, as there are already a number of overhead powerlines, telephone lines and pipelines scattered throughout the immediate area, and are, in themselves, not overly intrusive.

PV facilities of the proposed scale are not significantly intrusive when compared to other forms of energy production (e.g. wind and gas turbines). : **planning.org and EMA**

Figure 12 illustrates the ground-level view of PV panels and associated infrastructure.

The PV panels will be approximately two metres in height, buildings are unlikely to be over one storey in height (approximately 4.5 m), and the containerised battery system is likely to be less than 3 m in

height². Other infrastructure, such as powerlines are likely to be between 6 m and 8 m in height, but not visually intrusive in the receiving landscape. The PV facility is predicted, however, be clearly visible for up to 1 km from the site and visually intrusive for the residents along Tenth Street (within 100 m of the PV site) (Du Plessis, 2021) (refer to **Appendix B** for details). While this is not necessarily intrusive for all receptors, the PV facility is likely to alter the viewshed and nature of the area along Tenth Street in Withok Estates AH.

The view from Tenth Street is currently across the Ergo Mining slurry pipeline and onto the proposed PV facility site, which is currently open veld (rehabilitated tailings facility) (**Figure 13**). This Withok Estates AH area comprises a mix of residential, small-scale agriculture and non-agricultural businesses and activities (e.g. waste handling, logistics, storage yards, places of worship and non-profit organisations). **Figure 13** and **Figure 14** provide a view north-east and south-west along tenth street. The open spaces and distance between plots and activities provides a sense of being in a rural landscape, but within easy access of urban resources. The construction and operation of the proposed PV facility is likely to change this landscape through visual and other disturbances (discussed below).

This change is likely to affect residential plots more than businesses, as they rely on the viewshed and sense of place more than businesses (there were no tourism or other sensitive business noted in the area). The highest impact of changes in the visual landscape and other impacts are likely to affect an area of approximately 500 m³ from the PV facility, thereby altering the nature of this area.



Source: *planning.org* and *EMA*

Figure 12 Example of utility-scale PV installation and associated infrastructure

² Assumed to be a standard shipping container (2.6 m in height) with based of <400 mm

³ Refer to **Section 2.4.1** for rationale of 500 m



Figure 13 Current view of proposed PV site from Tenth Street – facing west south-west



Figure 14 View along Tenth Street

4.4.2 NOISE

Currently the area immediately around the project site is assumed to have a low level⁴ of background or environmental noise due to the nature of the area (peri-urban or semi-rural). It must be noted, however, that the proposed project site is on land zoned of mining, and there are a number of industrial activities within 1km of the site. There is a distinct audible but non-intrusive noise level assumed to be generated through industrial activities and traffic from the R23 and N17 highways⁵.

The construction phase of PV facility and overhead lines is likely to generate sporadic noise associated with normal construction activities. The operational phase is not anticipated to generate any significant noise from the substation or transmission lines (de Jager, 2021). There was also no noise impact assessment required for the Basic Assessment process.

It should be noted, however, that a slight elevation in noise (e.g. constant tonal sound from a transformer) could potentially disrupt social activities (e.g. sleep, work, quiet sense of place). Due to the proximity to the residential area of Withok Estates AH, consideration must be given to the location of the transformer, unless there is evidence that the transformer will be audibly intrusive.

4.4.3 HEALTH, SAFETY AND SECURITY

The study area is characterised by formal and informal activities and is peri-urban in nature. This combined with industrial and mining activities, as well low-income areas nearby, means that there is an existing concern for personnel and public safety (as evident in security infrastructure around plots and

⁴ Based on social specialist's site investigation and not empirical data

⁵ Based on site visit and interview with residents

noted by residents in interviews). Cable theft is common in the immediate area, with broken cables immediately adjacent to the proposed PV site visible during the site visit.

The construction and operational phases are likely to impact public safety near the PV site and along the overhead line route for two reasons:

- 1) The presence of construction and maintenance labour and jobseekers in the area can attract people with criminal intent to the area, and “disguise” these individuals and thereby allowing them to access the area unnoticed; and
- 2) The presence of high-value goods and materials (e.g. cable, PV components) could attract the attention of criminals, and which could spread into the adjacent properties.

4.4.4 LIGHTING INTRUSION

The Withok Estates AH area is relatively dark at night, given the nature of the area (i.e. peri-urban with no major roads or industrial activities nearby). Lighting will be installed for the PV facility for night-time security. The intrusion of light on to the properties of neighbouring residents (Tenth Street) could disturb night-time activities (specifically sleep). While this would provide some security for neighbouring residents, and deter criminals from the area, the nature of the area would be changed, and residents would need to adjust to a new environment. Direct and intrusive lighting could significantly alter night-time activities and change the sense of place for the area.

4.4.5 ROADS

The roads in Withok Estates AH consist mostly of unpaved, gravel roads. These roads are currently degraded due to erosion from rain and use, with many being impassable with normal vehicles during the summer rainy season. According to local residents and the complaints laid with Ergo, the roads generate dust during winter months which becomes a nuisance for local residents.

There is unlikely to be much use of public roads along the overhead powerline route, as much of this is on private land. However, Tenth Street immediately adjacent to the PV site is of concern. This is a municipal road but is reportedly used currently by Ergo Mining employees or contractors for maintenance and security vehicles. A local resident interviewed indicated this has resulted in further degradation of this portion of road. The construction and operation of the PV facility could potentially see an increase in use and degradation of the road if the access roads to the site are maintained effectively.

4.4.6 GRAZING AND SUBSISTENCE AGRICULTURE

The open veld along the overhead line route and the PV site are used by local subsistence farmers to graze cattle and goats on an ad hoc and informally basis. Although the proposed PV facility will be located on private land, this land is currently not secured and is regularly accessed by the public, which is a common practice in South African cities.

The area along the overhead lines comprise of mostly municipal land, with some private land and road reserves. The land earmarked for the proposed PV site is owned by Ergo Mining, and therefore private, although unsecured and accessible by the public.

The farmers and herders will still be able to access the land underneath the overhead lines as they are raised well above the ground. The land at the PV site will however become unusable by these subsistence farmers as it will be secured and fenced off from the general public. The PV site forms part of a much larger open area that is evidently accessed regularly by local livestock owners/farmers. The PV facility site (approximately 42 ha) is approximately 12% of the open land (estimated at 360 ha) informally used for such grazing activities. It is, therefore, unlikely that the subsistence farmers will lose substantial grazing land as a result of the proposed project. Further investigations may be required to assess the potential impact on livelihoods of this loss.

4.4.7 COMMUNITY BENEFITS

The intention of the proposed project is for energy to be produced solely for Ergo Mining Brakpan Plant and Brakpan/Withok Tailings Dam facility. The social or local community benefits are anticipated to be

limited to direct employment opportunities (as per **Section 1.2.2**) and indirect economic development and employment opportunities through contractor and service providers. It is understood, however, that Ergo assists subsistence farmers in the local area (through a third party and the Ekurhuleni Municipality) as part of their mining rights and social and labour plan community projects. This includes funding for subsistence and emerging livestock and vegetable farming through a Broad-Based Livelihoods programme (Ergo Mining, 2018). This includes supporting local farmers through skills development (business and agriculture) and provision of infrastructure for 120 urban farmers (Ergo Mining, 2018). This initiative will continue to be supported in the Ekurhuleni area through the proposed project, which will assist with stabilising energy supply, and therefore production and the business as a whole. It must be noted, however, that grazing on the proposed project site and immediately surrounding land (owned by Ergo) by local subsistence farmers is undertaken informally, and not considered to form part of this assistance.

4.5 REVIEW OF SPECIALIST STUDIES

A review of the other specialist studies related to the EIA process was conducted to identify potential indirect social or socio-economic aspects and impacts that may result from the proposed project.

A summary of the key findings of each of the reviewed studies is provided in **Appendix B**, and a summary of their “socio-economic relevance“ of these findings is provided in **Table 9**. Only the studies that had the potential to have a social or socio-economic impact were reviewed. The full reports can be found in the appendices of the BAR report.

Table 9 Summary of relevance of other specialist studies

Study	Relevance for the SIA
Visual Impact Assessment (du Plessis, 2021)	The findings indicate that the highest visual impact is anticipated to be within 1km of the PV facility site, specifically the residents of the Withok Estates AH (smallholdings) (south-east and south-west of the site). Other areas outside of 1 km are likely have a lower visual impact The visual impact of the proposed project, specifically the PV facility is likely to change the nature of the area for the residents of Withok Estates AH, especially on Tenth Street.
Heritage Impact Assessment (Van der Walt, 2021)	The findings of the study indicated that only 1 heritage resources was found on the PV facility site, which is likely to be impacted by the proposed project (Feature 6- Refer to Heritage study). The area had been previously disturbed by mining activities. The overhead powerline route has five heritage features within close proximity; and is unlikely to be impacted by the development. There is no socio-economic aspect that is likely to be affected based on the findings of the heritage impact assessment.
Terrestrial Biodiversity (Vegetation) Assessment (Dimela ECO Consulting, 2021)	The report describes cattle were observed grazing in open areas along the overhead line route and near to the PV facility, and that the open veld on and around the proposed project site shows signs of prolonged grazing by livestock (although informal and seasonal). The presence of herders and livestock within the construction and operational footprint could be a possible health and safety risk if the sites are not secured (e.g. cattle falling into excavations, theft of materials, electrocution). A livestock owner was interviewed during the SIA, and no concern was expressed for health and safety of herders or livestock. However, cognisance must be given to this group of stakeholders who use the area (although informally) on a regular basis in terms of health and safety management and consultation processes.
Noise assessment option (de Jager, 2021)	In the opinion of the specialist, substations and battery energy storage system do not require a noise study. Such facilities do not generate significant noise levels and this theme is of least concern (as per the screening report, GNR 320). The specialist therefore does not recommend that a noise assessment be undertaken. It should be noted the residential area of Withok Estates AH is very close to the proposed substation and energy supply system (approximately 100 m). Any that a slight elevation in noise could potentially disrupt social activities but based on the above statement is not an aspect of concern from a socio-economic perspective.

5 IMPACT ASSESSMENT

The impact assessment includes the socio-economic impacts of the proposed layout, site, and technology as the only and preferred alternative for the proposed project (as provided in **Section 1.2.2**), as well as the “No-Go” alternative. The impact assessment considers the construction, operational, decommissioning (closure), and cumulative impacts of the proposed project.

5.1 ALTERNATIVE 1 (PREFERRED ALTERNATIVE)

5.1.1 CONSTRUCTION PHASE

I. INCREASED EMPLOYMENT OPPORTUNITIES

Activity Development of PV solar facility, 22 kV overhead lines, energy storage system and associated infrastructure.

Description The construction phase is anticipated to take sixteen months, and employment up to 125 people. This includes four management, three Professional, 22 skilled, 11 semi-skilled, and 85 unskilled positions. The estimated capital value of employment is R 4.7 million.

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 31 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 31 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 in individual income generation.

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 Refer to the **Section 7.1.1** (Management and mitigation) for details, including:

- ▶ 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	Intensity	Extent	Duration	Consequence	Probability	Significance	Nature
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

II. INCREASED LOCAL ECONOMIC DEVELOPMENT OPPORTUNITIES

Activity Development of PV solar facility, 22 kV overhead lines, energy storage system and associated infrastructure.

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). 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 Refer to the **Section 7.1.1** (Management and mitigation) for details, including:

- ▶ 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	Intensity	Extent	Duration	Consequence	Probability	Significance	Nature
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Without	Low	Low	Low	Low	Medium	Very Low	Positive
With	Medium	Low	Low	Medium	Medium	Low	Positive

Reversibility Highly reversible

Cumulative impacts None

Residual impacts None

Climate Change N/A

III. REDUCED PUBLIC SAFETY

Activity Development of PV solar facility, 22 kV overhead lines and associated infrastructure.

Description During the construction phase, there will be an influx of labour, machinery, traffic, and potentially jobseekers into the area, especially at the PV facility site, over the sixteen-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.

The PV site 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).

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 Refer to the **Section 7.1.1** (Management and mitigation) for details, including:

- ▶ 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	Nature
Without	Medium	High	Low	Medium	High	Medium	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

IV. INCREASED NUISANCE, DISRUPTION AND INDIRECT COSTS

Activity	Development of PV solar facility, 22 kV overhead lines system and associated infrastructure.
Description	<p>The construction phase is likely to alter the sense of place and impact the local residents, particularly near to the PV facility through changing the local environment. These changes are likely to include:</p> <ul style="list-style-type: none"> ▶ Increased noise (excavation, labour, machinery and traffic); ▶ 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. <p>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.</p> <p>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 winter⁶, 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.</p> <p>Disrupting the local sense of place could result in people altering their daily activities, losing income due to noise and disruption (e.g. los 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).</p>
Potential Impact	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 sixteen-month period of construction, but

⁶ Based on responses from a local resident regarding dust emissions from vehicles on site and reported complaints to Ergo Mining (Ergo Environmental Manager, 2021).

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.

Mitigation Refer to the **Section 7.1.1** (Management and mitigation) for details, including:

- ▶ Ensure dust, noise and visual impact are minimised.
- ▶ Maximise and monitor local recruitment and procurement
- ▶ Complaints Procedure

Overall Impact 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.

Mitigation	Intensity	Extent	Duration	Consequence	Probability	Significance	Nature
Without	High	Medium	Low	Medium	High	Medium	Negative
With	Medium	Medium	Low	Medium	Medium	Low	Negative

Reversibility Reversible

Cumulative impacts None

Residual impacts The impact on neighbouring residents would contribute to the change in sense of place, as discussed in **Section VI** below

Climate Change N/A

V. REDUCED ACCESS TO LIVELIHOOD RESOURCES

Activity Development of PV solar facility.

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 facility site (42 ha) is approximately 12% of the open land (estimated at 360 ha) used for such grazing activities.

It is unlikely that the removal of this amount of open veld from the available space to have an impact on the livelihoods of the people 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 grazing in the immediate area.

Potential Impact There is unlikely to be a significant impact on local subsistence farmers or commercial agriculture, 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 Refer to the **Section 7.1.1** (Management and mitigation) for details, including:

- ▶ 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	Nature
Without	Low	Medium	Low	Low	High	Low	Negative
With	Very Low	Medium	Low	Low	Low	Very Low	Negative

Reversibility Reversible

Cumulative impacts None

Residual impacts None

Climate Change N/A

5.1.2 OPERATIONAL PHASE

I. INCREASED EMPLOYMENT OPPORTUNITIES

Activity Operations of PV solar facility, 22 kV overhead lines, energy storage system and associated infrastructure.

Description The operational phase (20 years or more) is anticipated to create 14 new direct job opportunities. Including one management, one professional, two skilled, four semi-skilled and six unskilled. The total employment cost is anticipated to be approximately R 2.3 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 Refer to the **Section 7.1.1** (Management and mitigation) for details, including:

- ▶ 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	Nature
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						

II. INCREASED LOCAL ECONOMIC STIMULATION OPPORTUNITIES

Activity	Operations of PV solar facility, 22 kV overhead lines, energy storage system and associated infrastructure.
Description	<p>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 2.7 million (escalating at 6% increase per annum).</p> <p>The opportunity cost associated with the proposed project should, however, be considered. The current land use for the PV site (a remined tailings facility) 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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
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 Refer to the **Section 7.1.1** (Management and mitigation) for details, including:

- ▶ 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	Nature
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

III. INCREASED NUISANCE, DISRUPTION AND INDIRECT COSTS

Activity Operation of PV solar facility

Description The operational phase is likely to change the nature of the immediate area surrounding the PV facility. 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 facility - change in viewshed from smallholdings in Withok Estates AH (specifically Tenth Street);
- ▶ Minor potential increased ambient noise (e.g. from transformers and traffic);
- ▶ 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 site is currently part of a mining area 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). The closure of the tailing facility on the PV site in 2002 means that this area of Withok Estates AH has not had much operational mining activity for almost twenty years. 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).

The change in nature of the area is unlikely to be significant, as PV facilities are not highly intrusive, although likely to be visually intrusive for neighbouring properties. 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 The design of the PV facility needs to minimise impacts on local residents Refer to the **Section 7.1.1** (Management and mitigation) for details, including:

- ▶ 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 (Du Plessis, 2021)
- ▶ 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	Nature
Without	Medium	Medium	Medium	Medium	High	Medium	Negative
With	Low	Medium	Medium	Medium	Low	Low	Negative

Reversibility Highly reversible

Cumulative impacts None

Residual impacts None

Climate Change N/A

VI. REDUCED PUBLIC SAFETY AND SECURITY

Activity Operation of PV solar facility

Description The operational phase is likely to make the area more secure, as the PV site 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.

Overhead lines could also pose a risk if they are not maintained and monitored appropriately – e.g. cable theft or poorly managed site could leave exposed cables accessible to the public.

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 Refer to the **Section 7.1.1** (Management and mitigation) for details, including:

- ▶ Ensure overhead lines are maintained and managed in accordance with regulated industry standards.
- ▶ 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	Nature
Without	High	Medium	High	High	Medium	Medium	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

5.1.3 DECOMMISSIONING PHASE

I. LOSS OF PERMANENT JOBS

Activity Decommissioning of PV solar facility, 22 kV overhead lines, energy storage system and associated infrastructure.

Description The total number of permanent employment opportunities is anticipated to be limited to 10 (ten), and people employed are likely to be from the local area and further afield (regional). 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 Refer to the **Section 7.1.1** (Management and mitigation) for details, including:

- ▶ 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	Nature
Without	Very Low	High	Very high	Medium	Very High	Medium	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

II. LOSS OF LOCAL ECONOMIC OPPORTUNITIES

Activity Decommissioning of PV solar facility, 22 kV overhead lines, energy storage system and associated infrastructure.

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	Refer to the Section 7.1.1 (Management and mitigation) for details, including: <ul style="list-style-type: none"> ▶ 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.
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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	Nature
Without	Low	Very High	Very High	High	Medium	Medium	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

III. INCREASED TEMPORARY EMPLOYMENT

Activity Decommissioning of PV solar facility, 22 kV overhead lines, energy storage system and associated infrastructure.

Description The total number of employment opportunities generated by the decommissioning process is anticipated to be 46, with 2 management, 4 skilled and 40 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 (25%), 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 Refer to the **Section 7.1.1** (Management and mitigation) for details, including:

- ▶ 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	Nature
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

5.2 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.

I. 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-term 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 extent, 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	Nature
Without	Medium	High	High	Medium	Very High	Medium	Negative

Reversibility N/A

Cumulative impacts N/A

Residual impacts N/A

Climate Change N/A

II. 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 176 new employment opportunities (166 temporary during construction and decommissioning; and 10 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 42 temporary jobs and three 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	Nature
Without	Very Low	High	Medium	Low	Very High	Low	Negative

Reversibility Reversible

Cumulative impacts N/A

Residual impacts N/A

Climate Change N/A

5.3 SUMMARY OF IMPACT ASSESSMENT

The overall impact of the proposed project is likely to be a negative change in nature of the local area associated with the PV Facility, as it could potentially disrupt local communities.

However, with good management these impacts can be mitigated to a low or very low significance and ensure that positive socio-economic impacts for local communities (Low significance) and the broader local and regional economy (low significance) are created. A summary of the anticipated socio-economic impacts and their relative significance is provided in **Table 10**.

Table 10 Summary of potential socio-economic impacts

Impact	Activity*	Nature	Significance	
			Without mitigation	With mitigation
PREFERRED ALTERNATIVE				
Construction Phase				
Increased employment opportunities	PV & OHL	Positive	Very Low	Low
Increased local economic development opportunities	PV & OHL	Positive	Very Low	Low
Reduced public safety	PV & OHL	Negative	Medium	Low
Increased nuisance, disruption and indirect costs	PV & OHL	Negative	Medium	Low
Reduced access to livelihood resources	PV	Negative	Low	Very Low
Operational Phase				
Increased employment opportunities	PV & OHL	Positive	Very Low	Low
Increased local economic stimulation opportunities	PV & OHL	Positive	Very Low	Low
Increased nuisance disruption and indirect costs	PV	Negative	Medium	Low
Reduced public safety	PV & OHL	Negative	Medium	Low
Decommissioning Phase				
Loss of permanent jobs	PV & OHL	Negative	Medium	Low
Loss of local economic opportunities	PV & OHL	Negative	Medium	Low
Increased temporary employment	PV & OHL	Positive	Insignificant	Very Low
NO-DEVELOPMENT ALTERNATIVE				
Loss of local economic development potential	PV & OHL	Negative	Medium	-
Loss of employment opportunities	PV & OHL	Negative	Low	-
* PV = PV facility and associated activities, access roads and infrastructure OHL = Overhead Lines and associated activities and infrastructure.				

6 SOCIO-ECONOMIC MAPPING

6.1 METHOD

The identification and mapping of socio-economic sensitivity is a multifaceted process. For the purposes of this study three key aspects were considered:

- 1) **Exposure** - Likelihood of being exposed to the direct and indirect biophysical and socio-economic impacts of the proposed project (including proximity to activities and probability of encountering impacts);
- 2) **Vulnerability** - Capacity (having the social and economic resources) to manage or cope with the social change processes and induced impacts (e.g. high impact + high capacity to cope = low sensitivity); and
- 3) **Tolerance** – The limit of acceptable change or tolerance of social or socio-economic change that can be absorbed by a community/household/individual (e.g. even with capacity to absorb a change, a community may be want the change to occur for indirect economic, cultural, or intrinsic reasons).

The current socio-economic status of communities in the study area were “overlain” (considered in context) with the level of potential exposure, vulnerability, and tolerance to provide insight into the key sensitive receptors and areas of high, medium and low socio-economic sensitivity.

6.2 RESULTS

Figure 15 and **Figure 16** illustrate the areas of potential socio-economic impact and level of significance. The key socio-economic sensitive receptors are anticipated to be the houses and businesses located immediately adjacent to the proposed project site, namely the Withok Estates AH community.

The rationale behind the allocation of high, medium, or low sensitivity are provided in **Table 11**.

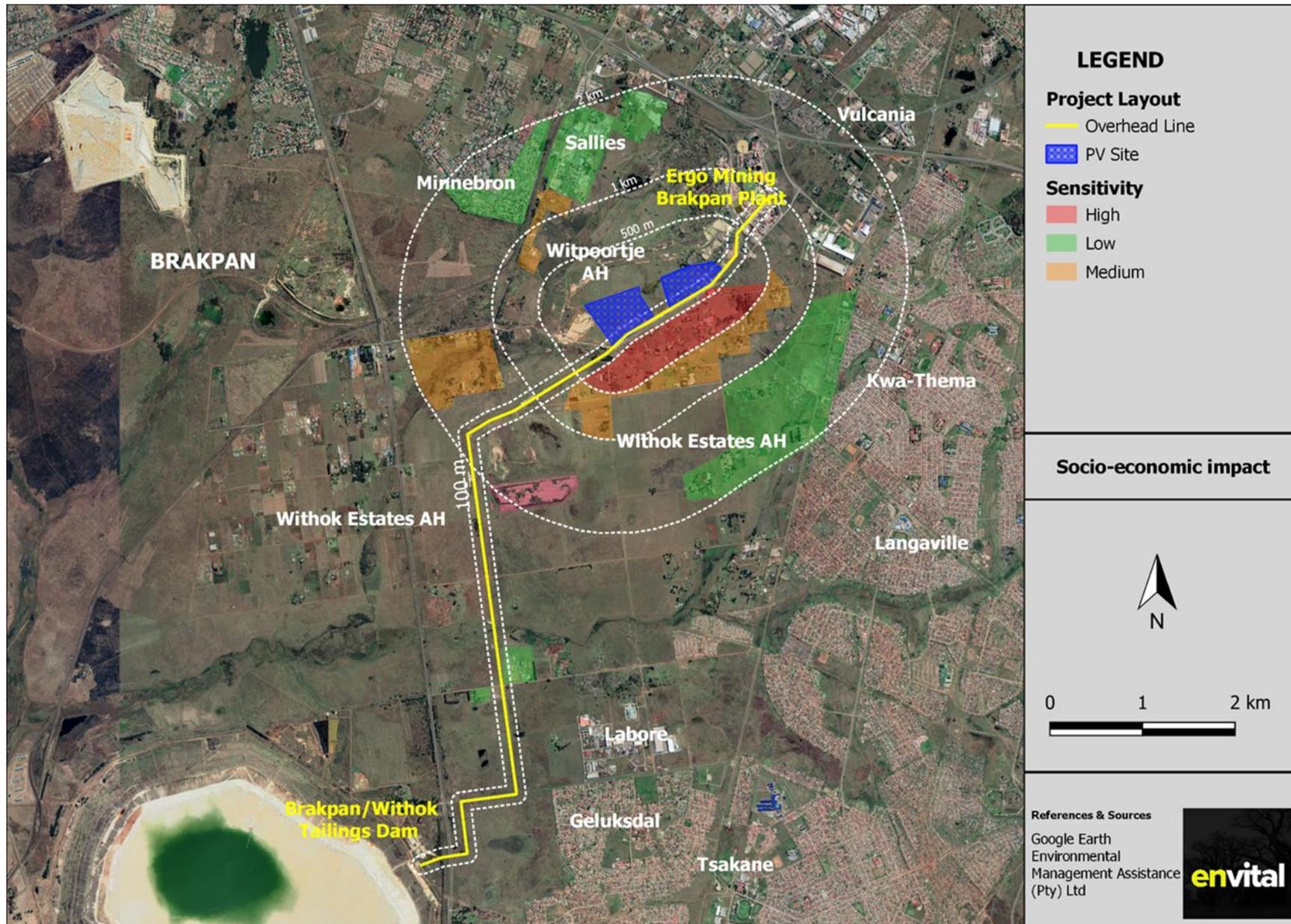


Figure 15 Socio-economic Impact – PV plant and Overhead Lines

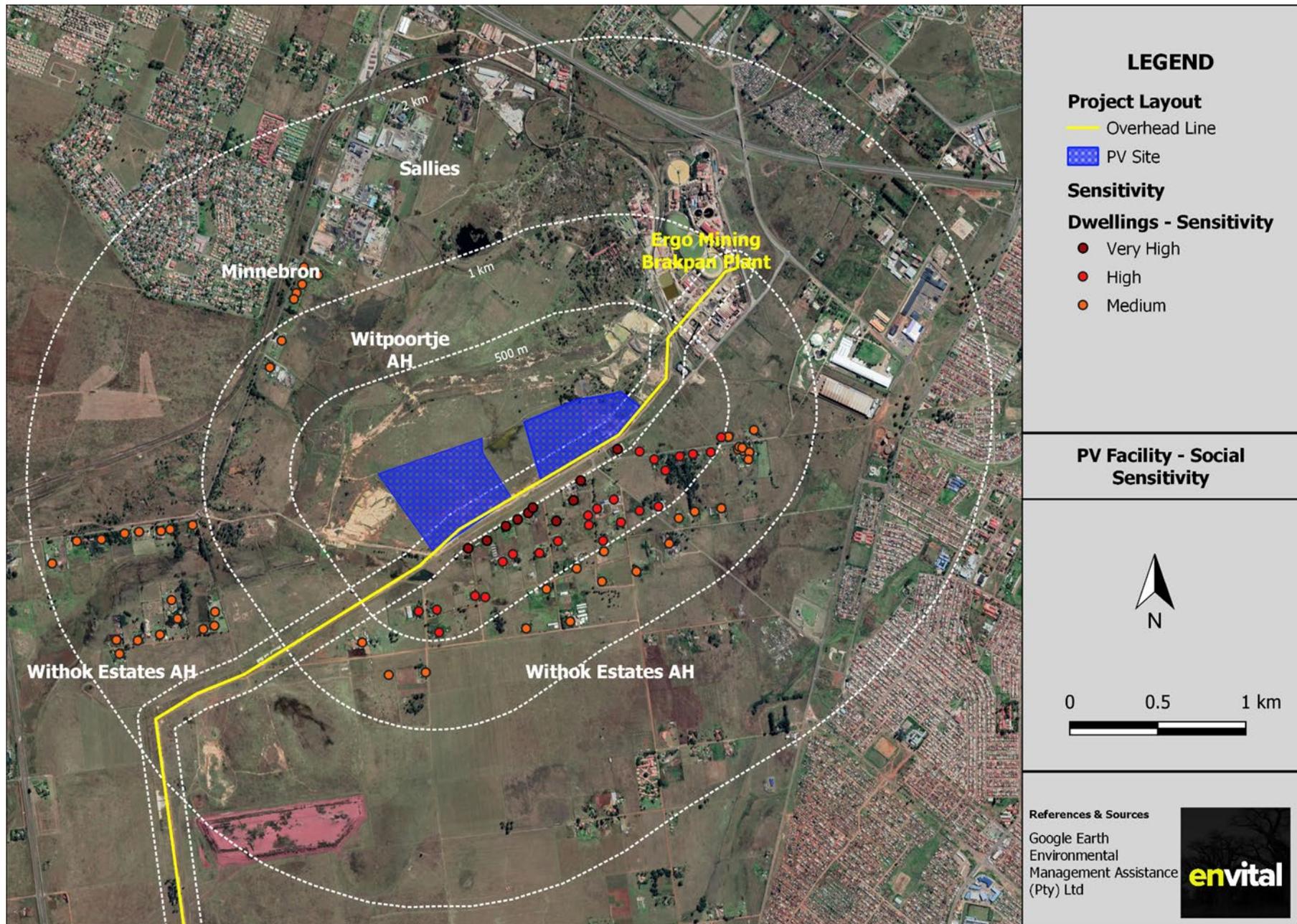


Figure 16 Socio-economic Impact – PV Site

Table 11 Socio-economic sensitivity rational

Sensitivity	Communities	Rationale		
		Exposure	Vulnerability	Tolerance
High	<p>1) Withok Estates AH – Tenth Street* and immediate neighbours (within 500 m⁷ of the PV site)</p> <p><i>*Further study would be needed to identify the sensitivity of specific properties, businesses or residents</i></p>	This group of houses and businesses are likely to be directly affected by the construction and operational phases, including noise, dust, visual and public health and safety impacts.	This is considered a lower- to middle-income community, which would have limited resources to adapt or have influence over decisions (i.e. low to moderate level of education and empowerment).	<p>There is a varying tolerance within the community, including:</p> <ul style="list-style-type: none"> – Lowest tolerance: Individuals who value the sense of place and would not leave unless the impacts are intolerable, which would cause personal socio-economic cost or hardship. – Highest tolerance: Individuals who would value development of opportunities in the area and the proposed project would not affect their business, property or way of life significantly. <p>The lowest tolerance is assumed to be applicable for the area, as this is the highest sensitivity.</p>
Medium	<p>1) Withok Estates AH (500 m - 1 km south-east of the PV site)</p> <p>2) Withok Estates AH (1 – 2 km west of PV site)</p> <p>3) Witpoort Estate AH (700 m – 1.2 km north-west of PV site)</p>	This community is likely to be exposed to indirect impacts, including visual impacts, change in nature of the area, and potentially public health and safety risks.	These communities are likely to vary in terms of vulnerability. It is assumed that many are low- to middle-income and so would have limited the resources to adapt or have influence over decisions (i.e. low to moderate level of education and empowerment). There are, however, likely to be exceptions, with individual residents being more or less vulnerable.	<p>The lowest tolerance is assumed to be applicable for the area, as this is the highest sensitivity.</p>
Low Sallies	1) Minnebron (1.2 km north-west of site)	The impact on this community is likely to be limited to visual impacts during construction and operation. The industrial nature of the local area is likely to visually “absorb” the PV facility in the long-term, and therefore have a short-to medium impact.	This is considered a middle-income community, which would have limited resources to adapt or have influence over decisions (i.e. low to moderate level of education and empowerment).	These communities is likely to tolerate low to moderate changes in the visual landscape, as this is an industrial and mining area.
	2) Withok Estates AH (1 – 2 km south-east and of PV site)	The impact on this community is likely to be restricted to limited visual impact (mainly along roads) during operation, and limited indirect impacts of	See above - “Medium” Withok Estates AH	

⁷ While the visual impact is likely to extend up to 1 km from the proposed PV site (Du Plessis, 2021), direct visual intrusion, which is likely to change the sense of place, is expected to affect the immediately neighbouring properties most severely. The reason is that these properties face and use roads adjacent to the PV site, while houses further way generally face away from the site and are less likely to see the site on a daily basis. In addition, noise, traffic, and reduced safety and security is likely to affect these houses more directly than houses or properties set further away within Withok Estates AH. 500 m is therefore considered an appropriate area to encompass the directly impacted properties.

Sensitivity	Communities	Rationale		
		Exposure	Vulnerability	Tolerance
		construction, such as dust, traffic and change in sense of place). The impact is likely to be short-term, as the PV site is likely to be unintrusive in this area.		
	3) Sallies	The impact on this community is likely to be limited to visual impacts during construction and operation. The industrial nature of the local area is likely to visually “absorb” the PV facility in the long-term, and therefore have a short-to medium impact.	This is an industrial area and is likely to be less vulnerable than residential areas to visual and other impacts of construction and operation of the PV facility.	
	4) Withok Estates AH (near overhead lines – Labore/Geluksdal)	There are two properties that may be affected by visual, and nuisance impacts during construction. The operational phase of the overhead lines is unlikely to have any significant impact on the social or economic environment.	See above - “Medium” Withok Estates AH	

7 KEY REQUIREMENTS FOR AUTHORISATION

7.1 SOCIAL MANAGEMENT AND MITIGATION

Should the Proposed project be authorised, it is recommended that the socio-economic management and mitigation measures described in **Table 12**, **Table 13**, **Table 14** be integrated into the Environmental Management Programme and authorisation.

7.1.1 PLANNING PHASE

Impact	Objectives	Mitigation/Management measures	Timing and frequency	Responsible person/s
I. Nuisance, Disturbance and Indirect costs to businesses and residents	Minimise nuisance, disturbance and prevent indirect costs to neighbouring residents and businesses.	<ul style="list-style-type: none"> ▶ Design of facility to minimise visual impact on immediate neighbouring properties (Tenth Street) – e.g.: <ul style="list-style-type: none"> ▪ Using colour/paint on infrastructure so that it blends in with the landscape (e.g. greens and browns on large flat buildings or structures) ▪ Lighting should be low impact (e.g. Outside lighting should not be white, but coloured with the beam directed vertically downwards and activated by motion detectors) ▶ Ensure mitigation measures recommended by the visual impact assessment are implemented including vegetation screens and maintained. ▶ Locate transformers and other noise producing infrastructure on the northern or western side of the facility, or as far from residential houses as possible. ▶ Minimise vegetation removed from site and plant vegetation barriers using appropriate, indigenous species on the south-eastern side of the site (in collaboration with environmental officer and vegetation specialist). 	Annual audit	Community Liaison Officer / Officer / another relevant person

7.1.2 CONSTRUCTION PHASE

Table 12 Social Management and Mitigation – Construction Phase

Impact	Objectives	Mitigation/Management measures	Timing and frequency	Responsible person/s
I. Increased Employment Opportunities	Maximise employment benefits for local population	<ul style="list-style-type: none"> ▶ 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 radius⁸ of the site or from within Ekurhuleni Local Municipality as a minimum – but as long as this does not conflict with labour law. ▶ 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. ▶ 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. ▶ Prevent nepotism / corruption in local recruitment structures through transparent and fair recruitment practices. 	Commence during planning phase, continue throughout construction.	HR Manager
			Monthly audit	Environmental Control Officer (ECO)
II. Increased local economic development opportunities	Generate economic benefit for local suppliers and businesses	<ul style="list-style-type: none"> ▶ 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: <ul style="list-style-type: none"> ▪ Developing a register of local Small, Medium and Micro Enterprises (SMMEs) that could provide goods and services ▪ Identify and develop links with skills development/ SMME development institutions 	Commence during planning phase, continue throughout construction.	Project Manager
			Monthly audit	ECO
III. Reduced public health and safety	Minimise risk to neighbouring residents	<ul style="list-style-type: none"> ▶ Fence and secure the construction area as soon as practically possible, and preferably at the commencement of construction. ▶ Stakeholder Engagement - Engage with neighbouring residents and businesses on an ongoing basis - at least every two months. 	Monthly audit	ECO

⁸ 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.

Impact	Objectives	Mitigation/Management measures	Timing and frequency	Responsible person/s
		<ul style="list-style-type: none"> ▶ Monitor and report on Complaints Procedure – Refer to Section 7.1.6 		
IV. Increased nuisance, disruption and indirect costs	Minimise disruption to local communities and indirect costs to businesses and residents	<ul style="list-style-type: none"> ▶ Ensure mitigation measures recommended by the visual impact assessment are implemented including vegetation screens and maintained. ▶ Ensure suitable dust suppression (e.g. daily water or chemical suppression during dry windy periods) on construction site and access roads (as per the Environmental Management Programme), and should ongoing complaints be received from local stakeholders, an investigation and mitigation put in place. ▶ 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: <ul style="list-style-type: none"> ▪ Developing a register of local Small, Medium and Micro Enterprises (SMMEs) that could provide goods and services ▪ Identify and develop links with local skills development/ SMME development institutions ▶ Monitor and report on Complaints Procedure – Refer to Section 7.1.6 	Monthly audit	ECO
V. Reduced access to livelihood resources	Minimise disturbance to existing livelihoods within 1 km of the site	<ul style="list-style-type: none"> ▶ Communications Plan – Refer to Section 7.1.5. ▶ Fence off and secure the construction areas to ensure that livestock and people are not unintentionally exposed to construction activities. ▶ Monitor and report on Complaints Procedure – Refer to Section 7.1.6. 	Monthly audit	ECO

7.1.3 OPERATIONAL PHASE

Table 13 Social Management and Mitigation – Operational Phase

Impact	Objectives	Mitigation/Management measures	Timing and frequency	Responsible person
II. Increased employment opportunities	Maximise employment benefits for local population	<ul style="list-style-type: none"> ▶ Maximise and monitor local recruitment by ensuring that, where possible, the proponent must appoint portions of new employment positions from the local area – i.e. preferably within 10 km radius of the site or from within Ekurhuleni Local Municipality as a minimum – but were these does to not conflict with labour law. ▶ Consultation with local municipality, Department of Labour, and local communities through the appropriate channels must be conducted to make use of local businesses where possible. ▶ Ensure local employment and local services providers are appointed where possible. ▶ Prevent nepotism / corruption in local recruitment structures through transparent and fair recruitment practices. 	<p>Annual audit</p> <p>Commence prior to operation and monitor throughout operation</p>	HR/Procurement Manager
III. Increased local economic stimulation opportunities	Generate opportunities and support local businesses.	<ul style="list-style-type: none"> ▶ Ensure that goods and services are procured from within Ekurhuleni Municipality, and preferably from within 10 km of the proposed project site as far as possible by: <ul style="list-style-type: none"> ▪ Developing a register of local Small, Medium and Micro Enterprises (SMMEs) that could provide goods and services. ▪ Consultation with local municipality and communities to make use of local businesses and skills where possible. ▶ Maximise (through empowerment) and monitor local content by ensuring that, where possible, the operator and contractors appoint local businesses. ▶ Manage community expectations through open discussion on opportunities and projects and encourage active support from local government to support local communities. 	<p>Annual audit</p> <p>Commence prior to operation and monitor throughout operation</p>	HR/Procurement Manager
IV. Increased nuisance disruption and indirect costs	Prevent and mitigate indirect costs to neighbouring	<ul style="list-style-type: none"> ▶ Ensure mitigation measures recommended by the visual impact assessment are implemented including vegetation screens and maintained. 	Annual audit	Community Liaison Officer / Officer / other relevant person

Impact	Objectives	Mitigation/Management measures	Timing and frequency	Responsible person
	residents and businesses.	<ul style="list-style-type: none"> ▶ Ensure access roads are maintained, and private security and maintenance vehicles do not use Tenth street or other public roads to access site. ▶ Dust generated from the site and access roads must be managed on an ongoing basis, especially in winter. ▶ Monitor and report on Complaints Procedure – Refer to Refer to Section 7.1.6. 		
V. Reduced public safety and security	Minimise risk to public from activities associated with the PV facility and overhead lines	<ul style="list-style-type: none"> ▶ Ensure overhead lines are maintained and managed in accordance with regulated industry standards. ▶ Secure and monitor the site for theft and public health and safety risks. ▶ Monitor and report on Complaints Procedure – Refer to Refer to Section 7.1.6. – specifically for health and safety risks and incidents. 	Annual audit	Health and safety officer / other relevant person

7.1.4 DECOMMISSIONING PHASE

Table 14 Social Management and Mitigation – Decommissioning Phase

Impact	Objectives	Mitigation/Management measures	Timing and frequency	Responsible person/s
I. Loss of permanent jobs	Suitable transition following closure	<ul style="list-style-type: none"> ▶ Manage expectations and communicate with relevant employees and stakeholders to manage decommissioning of the plant. ▶ Ensure transferable skills are developed ▶ Identify opportunities for employees to be redeployed to other operations. 	Monthly Audit Commence six months prior to decommissioning	Environmental / Community Liaison Officer HR Manager Operations Manager
II. Loss of local economic opportunities	Economic transition into alternative businesses and enterprises	<ul style="list-style-type: none"> ▶ Manage decommission process and timeously notify services providers of closure. 	Monthly Audit Commence six months prior to decommissioning	HR / Procurement Manager Operations Manager
III. Increased temporary	Maximised local job creation at closure	<ul style="list-style-type: none"> ▶ Maximise and monitor local recruitment by ensuring that, where possible, the proponent must appoint portions of new employment 	Monthly Audit	HR / Procurement Manager

Impact	Objectives	Mitigation/Management measures	Timing and frequency	Responsible person/s
employment		<p>positions from the local area – i.e. preferably within 10 km radius of the site or from within Ekurhuleni Local Municipality as a minimum – but were these does to not conflict with labour law.</p> <ul style="list-style-type: none"> ▶ 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. ▶ Prevent nepotism / corruption in local recruitment structures through transparent and fair recruitment practices. 	Commence six months prior to decommissioning	Operations Manager

7.1.5 COMMUNICATIONS PLAN – CONSTRUCTION

It is recommended that the Community Liaison Officer (or other appropriate appointed person) develop and implement a communications or engagement plan to ensure that neighbouring communities are made aware of construction activities, timeframes and procedures.

The aim of a Communications Plan is to develop a strategy for effectively communicating information about the construction process and its associated activities with stakeholders, including local communities and business.

Proper engagement (i.e. two-way communication and problem solving) can reduce the risk to the operations (local social license to operate) and enhance local socio-economic benefits.

This plan should include:

- ▶ An up-to-date database of all relevant stakeholders, including – immediate neighbours on Tenth Street and along the overhead line route, and other relevant local community representatives such as Ekurhuleni Municipality Ward Councillors and Social Development department (who could inform livestock owners who graze in the area).
- ▶ 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).
- ▶ An indication of who is responsible for communication at each stage and according to each situation, including sender and receiver of each item.

Note: The Communications Plan does not need to be complex but should allocate responsibility and promote dialog with local communities, especially near to the site footprint. This plan should also include the Complaints Procedure during construction (refer to **Section 7.1.6**).

7.1.6 COMPLAINTS PROCEDURE – ALL PHASES

The aim of a Complaints Procedure is to develop a formal process that can be used by individuals, communities and stakeholders that may be affected by the construction, operations and decommissioning.

The Complaints Procedure should provide an opportunity for an independent review of complaints concerning operations and enhance accountability problem-solving dialogue and compliance monitoring.

This plan must include:

- ▶ 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;
- ▶ A formal record of all grievances – including recording, investigation, assessment, management and close out of all grievances;

8 CONCLUSION

The proposed development of a Photovoltaic (PV) facility capable of generating up to 20 MW and associated infrastructure (proposed project) aims to secure energy supply for the Ergo Mining Brakpan Plant and Brakpan/Withok Tailings Dam facility to ensure operational capacity during grid supply curtailment and interruptions. 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 overhead lines will run from the PV facility to the Ergo Central 88/6.6 kV substation at the mine and to the Ergo Transfer Pumps 88/11 kV substation at the Brakpan/Withok Tailings Dam. It is unlikely to significantly alter the socio-economic landscape beyond construction phase. The overhead lines are likely to assimilate into the current environment, and not interfere with the socio-economic landscape beyond expected health and safety risks.

The PV facility is, however, anticipated to change the nature of the site on which it is proposed. The proposed PV site is owned by Ergo Mining and currently comprises open veld, which was previously a tailings facility that has been mined and subsequently revegetated over time. 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. This site also provides 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 PV facility 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. The impact on livestock farmers is unlikely to be significant, as there is a large area of open land (private and public) 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:

- ▶ 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.
- ▶ Locate the transformer to the north-west side of the facility to prevent noise impacts, or far from houses as possible.
- ▶ 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.

8.1 IMPACT STATEMENT

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.

Although the proposed project is considered a small-scale development, 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.

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PERSONAL COMMUNICATIONS:

- Ekurhuleni Department of Social Development / Umsizi Sustainable Social Solutions (Pty) Ltd (email - various)
- Local Residents (Tenth Street) (Confidential) (pers. comm. 26/02/2021)
- Ergo Mining, Environmental Manager (pers. comm. 26/02/2021)

Appendix A. Details of Specialist

CURRICULUM VITAE

DANIELLE SANDERSON

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Danielle is an independent social and environmental management consultant with over 13 years' experience in environmental and social assessment and management in southern Africa. Experience includes specialist work in social and socio-economic impact assessments, environmental project management and impact assessments, stakeholder engagement and environmental planning. Danielle has worked in a variety of sectors including oil and gas, renewable energy, mining, industrial, housing, waste management, and bulk infrastructure.

KEY EDUCATIONAL QUALIFICATIONS

- ▶ MSocSci Environmental Management, University of KwaZulu-Natal, Durban – 2005.
- ▶ BSocSci (Hons) Geography & Environmental Management, University of Natal, Durban – 2002.

CERTIFICATED TRAINING

- ▶ Sustainable Livelihoods Where Social and Natural Systems Meet.
- ▶ Integrating HIV and Gender Related Issues into the EA Process.
- ▶ Sharpening the Tool: New Techniques and Methods in Environmental Impact Assessment.
- ▶ International course in Emotion, Outrage and Public Participation.

EMPLOYMENT HISTORY

Envital Consulting

Durban, South Africa | 2017 - Present

Independent Consultant

- ▶ Completed several Social and Socio-economic Impact Assessment studies for international, national, and local proponents and developers.
- ▶ Conducted IFC-aligned social and environmental operational audit and developed social and environmental operating policy (and associated training) in terms of IFC requirements.
- ▶ Developed an environmental assets and impacts register for an Illovo mill in Malawi.
- ▶ Completed several projects including environmental auditing for local clients, and socio-economic baseline assessments for international studies.

WSP Environmental (Pty) Ltd

Durban, South Africa | 2008 – 2017

Senior Environmental Consultant and Social Specialist

- ▶ Successfully managed a variety of EIA projects, from small to large.
- ▶ Managed international clients and multi-disciplinary teams.
- ▶ Conducted EIA and Social Impact Assessments (specialist studies) in line with IFC / World Bank requirements and South African legislation.

Real Consulting

Durban, South Africa | 2006 – 2007

Assistant Social and Environmental Consultant

- ▶ Assisted with several local economic development studies.
- ▶ Undertook field work with municipalities to integrate sustainability into local policy.

- ▶ Assisted with stakeholder engagement and community participation processes.

PUBLICATIONS AND CONFERENCES:

- ▶ *Visual Language: Enhanced Engagement in EIA*, International Association of Impact Assessors (IAIA), International Conference, Durban, May 2018.
- ▶ *Balancing Stakeholder Engagement within Coastal Management: a case study of developing coastal setback lines in the Western Cape*, IAIAAsa, Pretoria, August 2009
- ▶ Michel, D. P. and Scott, D. (2005). *The La Lucia – Umhlanga Ridge as an Emerging ‘Edge City’*. South African Geographical Journal, vol. 87, no. 2, pp. 104-114.

PROFESSIONAL ASSOCIATIONS

Held various roles within the International Association of Impact Assessment South Africa (IAIAAsa), including the National Executive Committee, and the KwaZulu-Natal Branch Chair, Conference Chairperson, and International Association of Impact Assessment Conference Local Organising Committee and Ambassador.

SELECTED PROFESSIONAL EXPERIENCE

Social Impact Assessments – South Africa

- ▶ Development of a greenfield, opencast platinum mine, Mpumalanga
- ▶ Realignment of the N3 highway at Key Ridge, eThekweni, KwaZulu-Natal
- ▶ Development of a medical waste incineration facility, Midrand, Gauteng
- ▶ Expansion of a general waste landfill site, Midrand, Gauteng
- ▶ Development of a wet maize mill, Vereeniging, Gauteng
- ▶ Baseline assessment for inter-country gas pipeline, Afghanistan and Pakistan
- ▶ Development of a glass bottle manufacturing facility, Vereeniging, Gauteng
- ▶ Development of 90 000 m³ fuel storage depot in Bayhead, Durban, KwaZulu-Natal
- ▶ Development of a fuel filling station, Howick, KwaZulu-Natal
- ▶ IFC-aligned SIA for three proposed (125 MW) wind power generation facilities, Western Cape
- ▶ IFC-aligned SIA for two proposed photovoltaic (125 MW) and concentrated solar power (250 MW) generation facilities, Northern Cape
- ▶ Smelter Minimum Emissions Standards Amendment, Thabazimbi, Limpopo
- ▶ Smelter Emissions Amendment, Polokwane, Limpopo
- ▶ Expansion of existing chrome mine, North West
- ▶ Reprocessing of tailing storage facility and associated infrastructure, Rustenburg, North-West
- ▶ Construction and operation of greenfield pulp and paper plant, Free State
- ▶ Expansion of an existing pulp and paper mill, Mpumalanga
- ▶ Expansion of a coal colliery, Mpumalanga
- ▶ Greenfield underground coal mine, Mpumalanga
- ▶ Biomass boiler renewable energy project, Mpumalanga

Environmental Authorisation Processes - Project Manager (South Africa)

- ▶ IFC-aligned EIA 250 MW Concentrated solar power, Northern Cape
- ▶ 40 000 m³ expansion of the fuel storage depot, Durban Port KwaZulu-Natal
- ▶ Bulk ore storage, Richards Bay Port, KwaZulu-Natal
- ▶ Expansion of polyester manufacturing plant, KwaZulu-Natal
- ▶ Construction and operation of a 10 MW gas turbine, KwaZulu-Natal
- ▶ Decommissioning for redundant steel mill, KwaZulu-Natal
- ▶ Upgrade of 40 000 m³ liquid petroleum gas storage facility, KwaZulu-Natal
- ▶ Development of provincial bulk water pipelines, KwaZulu-Natal
- ▶ Waste management license for recycling of used black oil, KwaZulu-Natal
- ▶ Waste management license and environmental authorisation for community healthcare centre, KwaZulu-Natal
- ▶ Industrial operational waste review and licensing, KwaZulu-Natal

Specialised – Southern Africa

- ▶ IFC-aligned social and environmental policy development and operational audits for three hydropower facilities, Free State, South Africa
- ▶ Aspects and impacts assessment at a sugar mill, Southern Region, Malawi

DECLARATION OF INDEPENDENCE

PROJECT TITLE

Ergo Mining Solar (PV) Energy: Phase 1

1. SPECIALIST INFORMATION

Specialist company / name:	Danielle Sanderson		
Specialist Qualifications:	Master of Social Science (Geography & Environmental Management), University of KwaZulu-Natal, 2006		
Professional affiliation/registration:	International Association of Impact Assessment South Africa		
Postal address:	PO Box 2159, Westville		
Postal code:	3629	Cell:	+27 72 259 8319
E-mail:	danielle@envital.co.za		

2. DECLARATION BY THE SPECIALIST

I, Danielle Sanderson declare that –

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of regulation 48 and is punishable in terms of section 24F of the Act.



Signature of the Specialist

Danielle Sanderson (Envital - Socila and Environmental Consulting)

Name of Company:

9 June 2021

Date

Appendix B. Specialist study Review

A. VISUAL IMPACT ASSESSMENT

The Visual Assessment study was conducted by Lourens du Plessis (Du Plessis, 2021). The report provided an assessment of the significance of the potential visual impacts, as well as management actions and monitoring programs for the highest impact-operating scenario (worst-case scenario), including potential cumulative visual impacts.

The assessment process made use of a detailed digital terrain model to determine the potential visual exposure, viewer incidence and perception (sensitive visual receptors), and the visual absorption capacity of the landscape. Thereafter the visual impact index could be calculated, and significance could be determined.

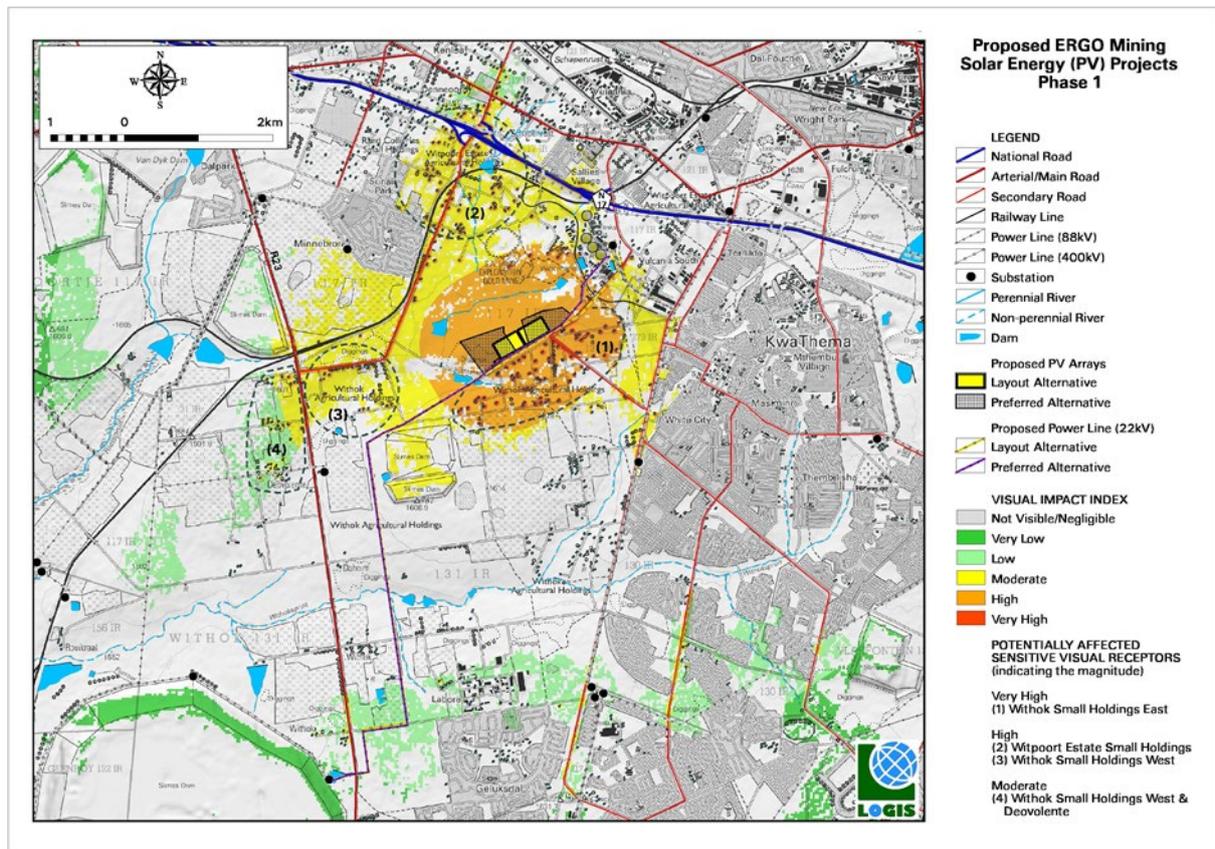
FINDINGS

Key findings of the Visual Impact Assessment relevant to the socio-economic assessment are summarised in **Table 15**.

Table 15 Key findings of the Visual Impact Assessment

Aspect	Key findings / Description
Potential visual exposure	<ul style="list-style-type: none"> ▶ Easily visible within a 1 km radius of the site. ▶ Visibility within a 1 – 3 km radius is scattered and interrupted due to the undulating nature of the topography. ▶ May constitute a high visual prominence within the 1km radius, potentially resulting in a visual impact. ▶ Receptors with may include residents residing at the Withok Estates AH (east and west) and at the Witpoort Estates AH, as well as observers travelling along the roads in close proximity to the facility.
Potential cumulative visual exposure	<ul style="list-style-type: none"> ▶ No cumulative visual exposure (or visual impacts) are expected.
Visual distance / observer proximity Viewer incidence / viewer perception	<ul style="list-style-type: none"> ▶ Sensitive visual receptors are located at the dwellings located at the smallholdings (Withok Estates and Witpoort Estates AH) to the south, west and north of the Ergo Mining Brakpan Plant. ▶ It is expected that the viewer's perception, unless the observer is associated with (or supportive of) the solar energy facility, would generally be negative.
Visual absorption capacity (VAC)	<ul style="list-style-type: none"> ▶ VAC is deemed low by virtue of the nature of the vegetation and the low occurrence of urban development. ▶ 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.
Visual impact index (combined visual exposure, viewer incidence/perception and visual distance)	<ul style="list-style-type: none"> ▶ Very high <ul style="list-style-type: none"> ▪ Residents of Withok Estates AH south of the proposed development site ▪ Secondary roads south and east of the proposed facility

Aspect	Key findings / Description
	<ul style="list-style-type: none"> ▶ High <ul style="list-style-type: none"> ▪ Residents of Witpoort Estates AH ▪ Withok Estates AH (west of the proposed facility) ▶ Medium <ul style="list-style-type: none"> ▪ Withok Estates AH (west of the R23) ▪ The Deovolente homestead south of these smallholdings



Visual impact index and potentially affected sensitive visual receptors

B. HERITAGE IMPACT ASSESSMENT

The Heritage Impact Assessment study was conducted by HCAC Heritage consultants (Van der Walt, 2021). The aim of the study is to investigate the proposed development footprint to identify cultural heritage sites, document, and assess their importance within local, provincial and national context

FINDINGS

Table 16 Key findings of the Heritage Impact Assessment

Aspect	Key findings / Description
Archaeological	<ul style="list-style-type: none"> ▶ The PV plant and power line will not impact directly on any recorded heritage resources. ▶ Some structures possibly older than 60 years were recorded in the vicinity of the power line, including stone structures and remnants of old farmstead structures (between 8 and 103 m from the powerline route).
Palaeontological	<ul style="list-style-type: none"> ▶ Separate study commissioned, as a moderate to high sensitivity

Aspect	Key findings / Description
Conclusion	<ul style="list-style-type: none"> ▶ No direct impact is expected on the identified features ▶ The project is acceptable from a heritage point of view based on adherence to the recommendations in this report and the approval of SAHRA
Recommendations	<ul style="list-style-type: none"> ▶ Indication of identified features on development maps and avoidance of these features. ▶ Implementation of a chance find procedure for the project (as outlined below).

C. TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT

The Terrestrial Biodiversity Assessment study was conducted by Dimela ECO Consulting (2021). The aim of the study is to investigate the proposed development footprint to undertake a terrestrial plant assessment in line with the terrestrial biodiversity protocols.

The study included the sourcing of background information relating to conservation plans and threatened ecosystems; conducting a field survey to determine the state of the vegetation and whether threatened or protected species are present or could be impacted on; to report, map and assess the vegetation communities, their conservation importance and function, and the impacts that the proposed development and related activities could have on the vegetation on site (including management and mitigation).

FINDINGS

Table 17 Key findings of the Vegetation impact Assessment

Aspect	Key findings / Description
Full site – current state	<ul style="list-style-type: none"> ▶ Vegetation was historically cultivated, mined, or indirectly impacted on by agricultural and mining activities. ▶ A number of cattle were noted to graze in a various areas
PV facility – current state	<ul style="list-style-type: none"> ▶ Much of the vegetation on the PV facility site is modified and of a low sensitivity. ▶ The moist grassland section on the PV facility site is classified as low due to its secondary nature.
Overhead Power line	<ul style="list-style-type: none"> ▶ Most of the vegetation is modified and in a secondary state. ▶ Natural to semi-natural vegetation remain in pockets, where it is situated around the streams and in between mining and agricultural impacts. ▶ Sensitive moist grassland areas along the route are relatively narrow and should be spanned by the powerlines. ▶ The sensitive rocky grassland will not be traversed by the proposed powerline route; however, the rocky grassland is within 50 m of the route and these areas should be avoided and not used for construction camps, laydown areas or parking.