K2022578590 (SOUTH AFRICA) PTY LTD

PHULA PV
VISUAL ASSESSMENT
IMPACT REPORT

Report No.: JW140/23/K135-02 - Rev 1

September 2023

Jones & Wagener
Engineering & Environmental Consultants

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DOCUMENT APPROVAL RECORD

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10-03-2023	0	Draft Baseline Report	J&W	Electronic	1
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NEMA Appendix 6 requirements

Regulation: GNR 982, December 2014, as amended	Specialist Report Description	Section in the Report
Appendix 6 (a)	A specialist report prepared in terms of these Regulations must contain— details of— the specialist who prepared the report; and the expertise of that specialist to compile a specialist report including a curriculum vitae;	Section 1.4 & App A
Appendix 6 (b)	A declaration that the specialist is independent in a form as may be specified by the competent authority;	App B
Appendix 6 (c)	An indication of the scope of, and the purpose for which, the report was prepared;	Section 1.6
Appendix 6 (cA)	An indication of the quality and age of base data used for the specialist report;	Section 2.1 and 2.2
Appendix 6 (cB)	A description of existing impacts on the site, cumulative impacts of the proposed development and levels of acceptable change;	Section 6.1
Appendix 6 (d)	The duration, date and season of the site investigation and the relevance of the season to the outcome of the assessment;	Section 3
Appendix 6 (e)	A description of the methodology adopted in preparing the report or carrying out the specialised process inclusive of equipment and modelling used;	Section 3
Appendix 6 (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 4 and 6.2
Appendix 6 (g)	An identification of any areas to be avoided, including buffers;	Section 4 and 6.2
Appendix 6 (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
Appendix 6 (i)	A description of any assumptions made and any uncertainties or gaps in knowledge;	Section 1.5
Appendix 6 (j)	A description of the findings and potential implications of such findings on the impact of the proposed activity or activities;	Section 6
Appendix 6 (k)	Any mitigation measures for inclusion in the EMPr;	Section 6.4
Appendix 6 (l)	Any conditions for inclusion in the environmental authorisation;	Section 7
Appendix 6 (m)	Any monitoring requirements for inclusion in the EMPr or environmental authorisation;	Section 6.4
Appendix 6 (n)	A reasoned opinion— i. whether the proposed activity, activities or portions thereof should be authorised; (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 7
Appendix 6 (o)	A description of any consultation process that was undertaken during the course of preparing the specialist report;	Refer main EIA
Appendix 6 (p)	A summary and copies of any comments received during any consultation process and where applicable all responses thereto; and	Refer main EIA
Appendix 6 (q)	Any other information requested by the competent authority.	Refer main EIA

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1. INTRODUCTION

1.1 Background

K2022578590 (South Africa) Proprietary Limited proposes to develop a solar photovoltaic (PV) facility (referred as "Phula PV project[1]") near Steelpoort on the Remainder and Portion 2 of the Farm De Grooteboom 373 KT in the Limpopo Province (refer **Figure 1-1**). The proposed project site is situated in close proximity to the local chrome and platinum mines near Steelpoort, 13 kilometres (km) south-east of the Ga-Mampuru settlement, and 33km north-west of the town of Lydenburg. The planned installed capacity output of the solar PV will be 130MW (DC power). The development area for the facility is ~200 hectares (ha). The proposed Phula PV Facility will consist of the following infrastructure:

- PV modules mounted on either a single axis tracking or fixed structure
- Inverters and transformers;
- Low voltage cabling between the PV modules to the inverters;
- Fence around the project development area with security and access control;
- Camera surveillance;
- Internet connection;
- 33kV cabling between the project components and the facility substation.
- 33/132kV onsite facility substation;
- Battery Energy Storage System (BESS) with a footprint of 3-5ha;
- Site offices and maintenance buildings, including workshop areas for maintenance and storage as well as parking for staff and visitors;
- Laydown/staging area on-site in front of mounting structures during installation. Temporary store area close to site entrance (Less than 2ha);
- Access roads (up to 6m wide) and internal distribution roads (up to 5m wide);
- Temporary concrete batching facility; and
- Stormwater management infrastructure.

[1] Please note that the project name was changed from Platinum PV as mentioned in the baseline report, to Phula PV as there is another solar PV project with than name already.

The Phula PV project is being developed with the aim of generating renewable energy to supply to the national grid under the Renewable Energy Independent Power Producer Procurement Programme (REIPPP). The developer will submit a bid in terms of a regulated power purchase procurement process (e.g., REIPPPP) to evacuate the generated power into the national grid.

In terms of the Environmental Impact Assessment (EIA) Regulations promulgated under National Environmental Management Act (Act 107 of 1998) (NEMA), an environmental authorisation (EA) is required for the proposed 130MW solar PV facility. Two (2) alternatives for grid connection infrastructure for the proposed facility has been considered however, this will be subject to a separate EA process.

Jones & Wagener (Pty) Ltd Engineering & Environmental Consultants (J&W) has been appointed as an independent Environmental Assessment Practitioner (EAP) to undertake a Scoping and EIA process (S&EIA) for the required EA application. As part of the process, specialist studies need to be undertaken. This report details the methods, analysis, and findings of the visual impact assessment undertaken for the proposed Phula PV project.

1.2 Specialist Details

The following personnel were involved in the compilation of this report. Refer to **Appendix A** for copies of the curricula vitae (CV's) and **Appendix B** for the declaration of independence.

Table 1-1: Specialist Team Members.

Name	Organisation	Role	Highest Qualifications	Experience	Professional Registrations
Konrad Kruger	J&W	Environmental Scientist	BSc Honours Geography	15 Years	Pr. SciNat 125641
Adriaan Oosthuizen	J&W	Project Director	B. Eng Civil Honours	23 Years	Pr. Eng (20040016)

1.3 Assumptions and Limitations

The following assumptions/limitations were relevant during the assessment:

- The survey was limited to the 20m contours from the surveyor general's office for the relevant quarter degree grid. No site specific or detailed survey was available for the visual modelling.
- Available 1:10 000 historical orthophotos were utilised for historical comparisons.
- For the viewshed the assumed height of an observer was set at 1.8m.
- The effect of the earth's curvature was included in the assessment.

1.4 Scope

The scope for this project was to provide a specialist visual impact assessment as per the requirements of the National Environmental Management Act, Act 107 of 1998 (NEMA) and the associated specialist protocol.

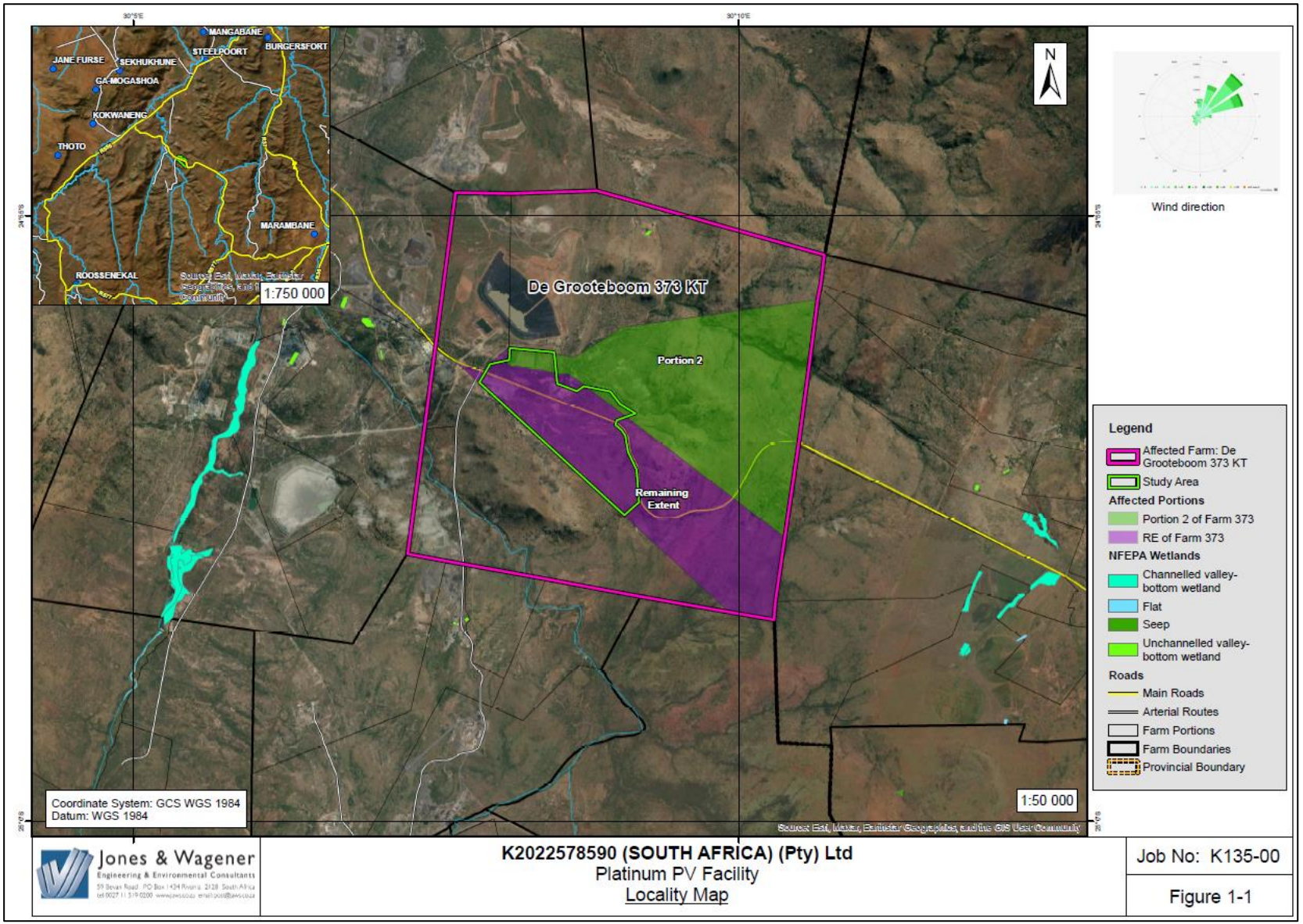
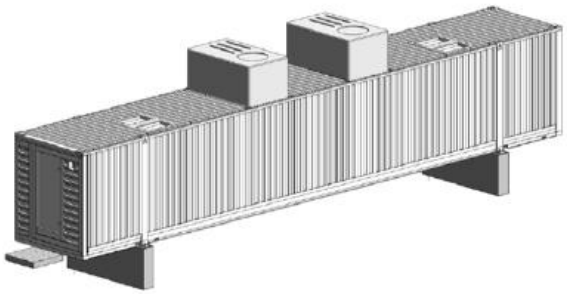


Figure 1-1: Locality of the project area

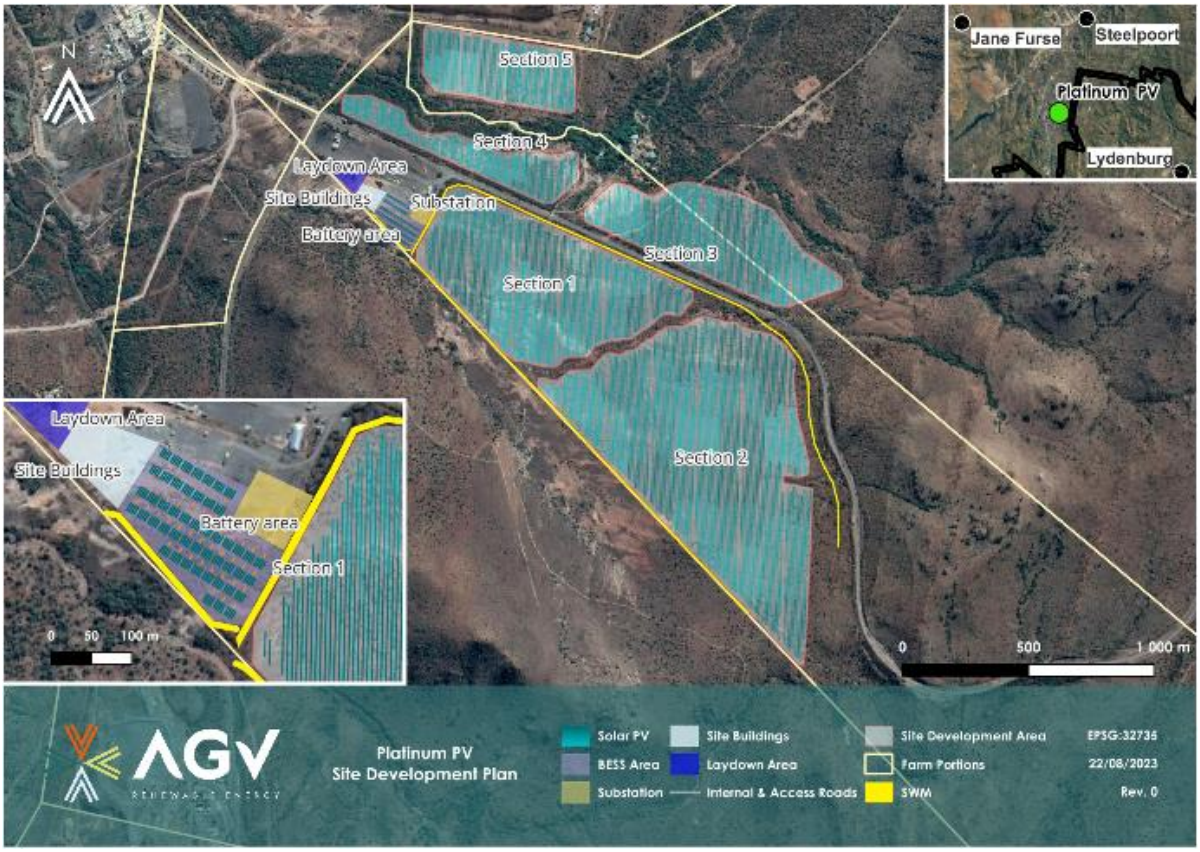
1.5 Project Components

The various project components are described in more detail in the table below.

Table 1-2: Solar Project Components

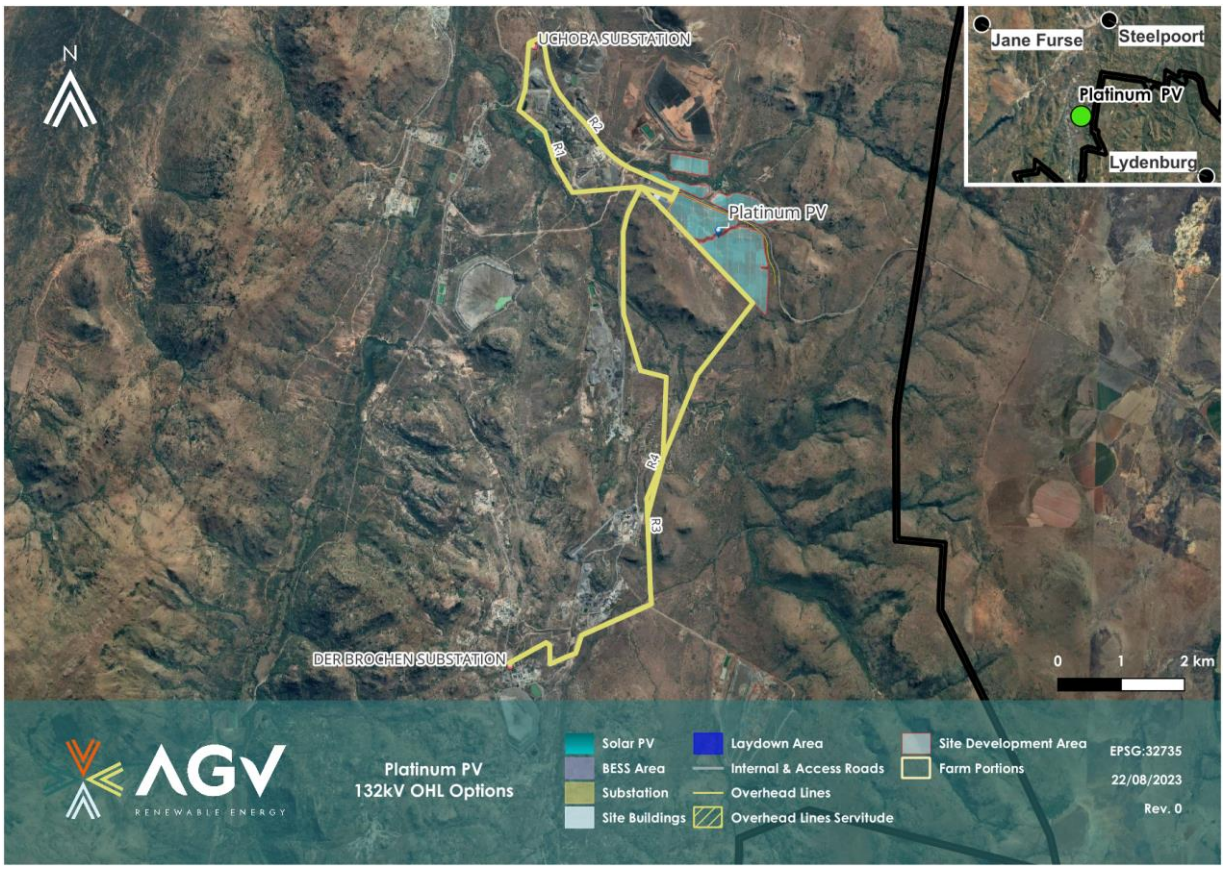
INFRASTRUCTURE	DESCRIPTION / DIMENSIONS
Contracted capacity of PV facility	Up to 130 MW
Technologies	• Solar Photovoltaic (PV) system • PV modules mounted on either a single axis tracking or fixed structure. • Monofacial or Bifacial Panels • Lithium-Ion, Vanadium Redox Flow or similar Batteries
BESS capacity	100MW / 500MWh
Onsite substation	33kV cabling between the project components and the facility substation. 33kV/132kV onsite facility substation.
Height of PV modules	3m at highest point above ground level when PV modules are pointing due east or west.
Battery array height	Up to 3.5 metres – see figure 1  **Figure 1-2: battery array**
On-site substation and BESS complex area	The proposed facility layout has been revised: A 50m buffer on either side of the Springkaanspruit, an ecological corridor dividing the main development area into two portions and the conceptual stormwater management infrastructure have informed the layout of the proposed Phula PV facility. Therefore, the revised facility layout makes provision for one on-site substation at the Section 1 (southwestern portion) of the proposed development – gold polygon in Figure below. The footprint area is approximately 0.6 ha. A BESS area is proposed west of the on-site substation with a proposed footprint area of approximately 2.5 ha – purple polygon in the figure below. The combined footprint is therefore (approximately) 3.1 ha. A construction laydown / storage area is proposed west of the BESS with a proposed footprint of 0.93 ha.

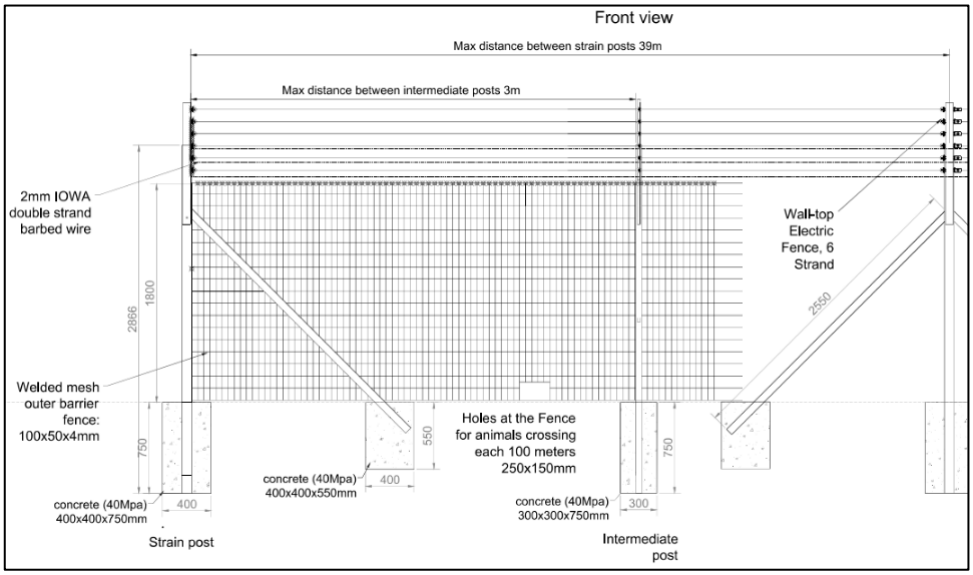
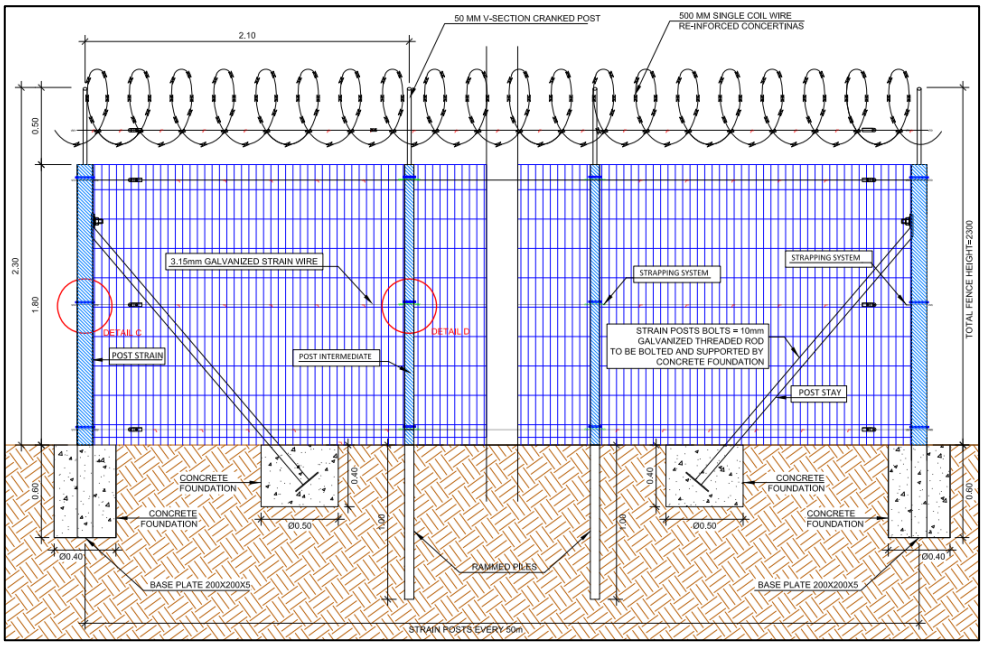
INFRASTRUCTURE	DESCRIPTION / DIMENSIONS



Proposed layout

Development footprints	Section 1	43.95 ha
	Section 2	79.45 ha
	Section 3	27.92 ha
	Section 4	12.6 ha
	Section 5	15.79 ha
	Laydown area	0.93 ha
	Site buildings	0.75 ha
	Substation	0.56 ha
	Battery Area	2.41 ha
Laydown and temporary storage area	Laydown/staging area on-site in front of mounting structures during installation. The proposed temporary store area is located west of the proposed BESS area with a footprint of approximately 0.93 ha (dark blue polygon in Figure 2)	
O&M building area	O&M building will be located at the area named 'Site Buildings' (light blue polygon in Figure 2) near the substation and battery areas or at the western-most side of Section 1. The estimated size of the building is 600m², excluding parking.	
Width of internal access roads	Access roads (up to 6m wide) and internal distribution roads (up to 5m wide).	

INFRASTRUCTURE	DESCRIPTION / DIMENSIONS
Length of internal access roads	To be determined based on final layout. Estimated at approx. 27 km.
Site access	Proposed access roads have been recommended by a transport engineer. These access points consider the various guidelines and policies in terms of the sites location and the provincial roads. Five access points are proposed (please refer to saved access roads kmz file): • Access 1 and 2 – access to the main (southern) facility area • Access 3 – opposite access 2 and this provides access to the northern most area (north of the Springkaanspruit). Access 3 will follow an existing gravel road which traverses the river. It is likely that this will require some works within the river to ensure safe crossing of the river. This may include culverts. If this is required, works within the river will be during the dry period. • Access 4 – this will provide access to the northeastern portion of the facility area – a new access is proposed as the existing access road is too close to Access 2 and 3. • Access 5 – opposite access 1 providing access to the most western portion area of the facility.
Grid connection and proximity (Subject to separate authorisation process)	Grid connection will be one of the following options, as shown by the diagram (KMZ files transmitted separately): 1. Route 1 between the solar PV site and the Uchoba 132kV Substation running South past Dwarsrivier Mine. 2. Route 2 between the solar PV site and the Uchoba 132kV Substation running North past Dwarsrivier Mine 3. Route 3 between the solar PV site and Anglo Mototolo Shaft supply substation, named Eskom Der Brochen Substation. Western line. 4. Route 3 between the solar PV site and Anglo Mototolo Shaft supply substation, named Eskom Der Brochen Substation. Eastern line.
	
Height of substation fencing	Fence height to be between 2.5m and 3m, as per the following: Example 1 (including electric fencing):

INFRASTRUCTURE	DESCRIPTION / DIMENSIONS
	 Example 2 (alternative to electric fence): 
Type of fencing	Welded steel chain link mesh, or welded steel mesh, hot-dip galvanised, or Clear-vu (or similar) fence.

2. DFFE SCREENING

2.1 Screening Tool Results

The project boundary was uploaded into the Department of Forestry, Fisheries and Environment (DFFE) Screening Tool and assessed for Visual/Landscape Theme Sensitivity. The DFFE Screening Tool results indicated that the larger study area classifies as Medium to Very High sensitivity in relation to the landscape theme due to slopes of between 1:4 and 1:10. The result from the screening is shown in **Figure 2-1** below.

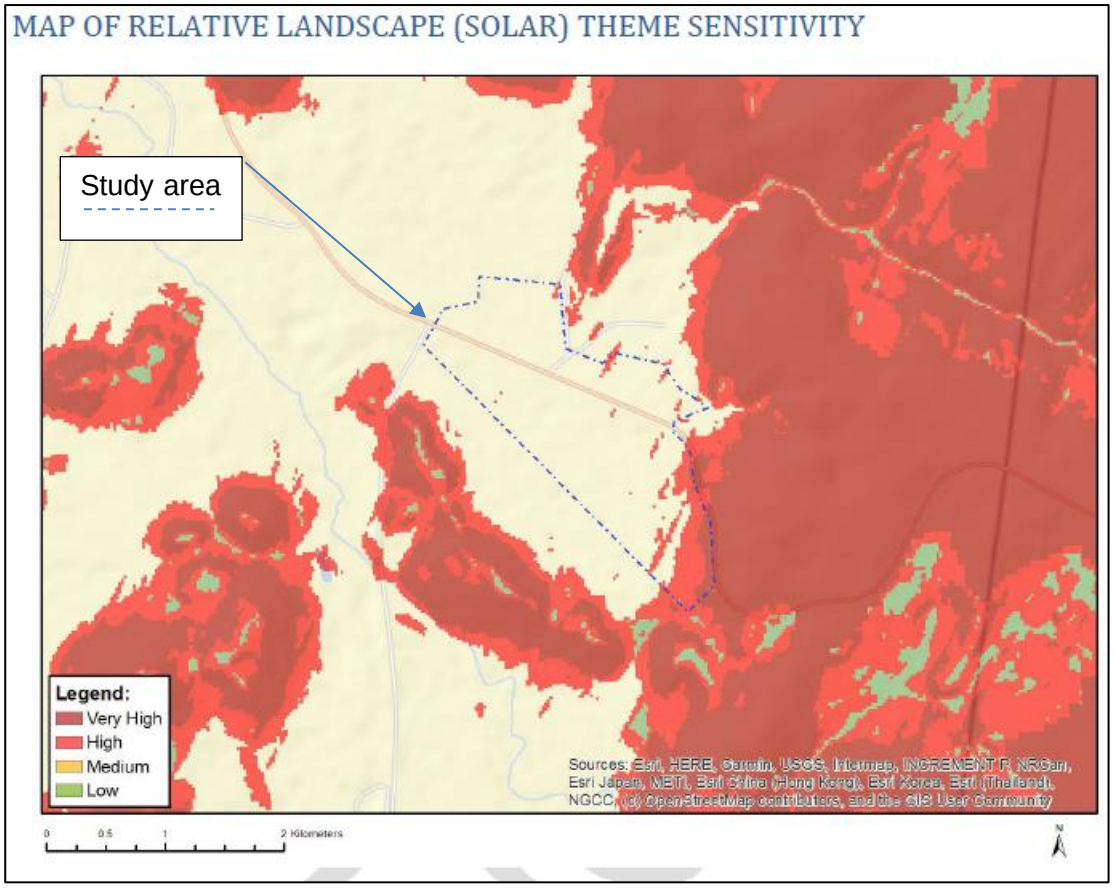


Figure 2-1: DFFE Screening Tool Results for Visual Sensitivity

2.2 Specialist Protocol Requirements

On 20 March 2020 GN 320 was gazetted (DFFE, GN 320 Specialist Protocols 2020) which included a protocol for specialist assessments. In terms of this regulation, there are no specific protocols for a visual assessment and therefore the required level of assessment must be based on the findings of the site sensitivity verification and must comply with Appendix 6 of the EIA Regulations. Refer to the table at the beginning of this report for the requirements of Appendix 6, and the relevant sections in this report containing the specified information.

3. APPROACH AND METHODOLOGY

3.1 Review of Existing Data/Reports

The first step of the baseline determination was to undertake a desktop review of all the available survey, topography and land use data available for the project area. The focus was on assessing the potential viewshed that the project area falls in.

3.2 Visual Baseline

The visual assessment covers each of the project areas as provided by the client and includes a 20km radius around the sites. The normal range of a human eye is in the order of 15km. To adequately assess the visual baseline, the following methodology was applied:

- All the required data was collected, which includes data on topography, existing visual character and quality, plans of the proposed development and the initial screening assessment;
- Fieldwork (a site visit) was conducted. The objectives of the fieldwork were to:
  - familiarise the author with the site and its surroundings;
  - to identify key viewpoints/ corridors and visual receptors;
  - ground truth the sensitivity of the landscape; and
  - determine the distance from which visual impacts are likely to become discernible.
- Landscape characterisation was done by mapping the site location and context and describing the landscape character and sense of place. This included considerations of geological and topographical features, vegetation and land-use.

Visual sampling was undertaken using photography from several viewpoints within approximately 20km of the site (see Figure3-1). The locations of the viewpoints were recorded with a GPS and photographs were taken at a depth of field between 45-55mm. A selection of these was used in the assessment phase of the Visual Impact Assessment (VIA) to illustrate the likely zone of influence and visibility.

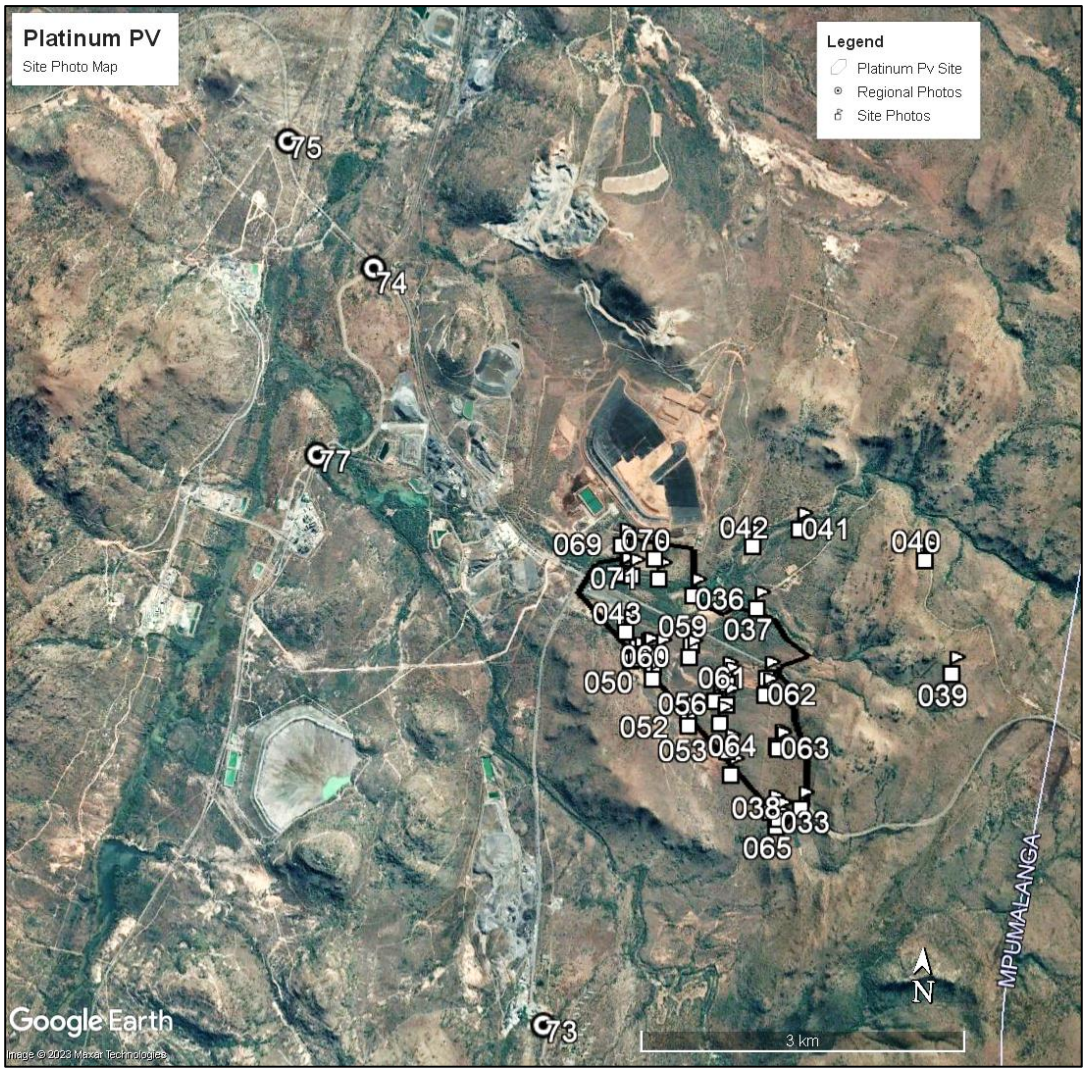


Figure 3-1: Map of photo locations

4. VISUAL BASELINE DESCRIPTION AND RESULTS

4.1 Desktop Data Sources

The following data sources were utilised in this project on the desktop level:

- 20m contours from the surveyor general's office for the relevant quarter degree grid. No site specific or detailed survey was available for the visual modelling.
- National Land Cover Database (DFFE, National Land Cover Database South Africa 2018)
- Olifants and Letaba Environmental Management Framework (Environomics 2009)
- Available 1:10 000 historical orthophotos were utilised for historical comparisons.

4.2 Desktop Descriptions

4.2.1 Environmental Management Framework

According to the regional Environmental Management Framework (EMF) (Environomics 2009) the region is described as the Rural Sekhukhune/platinum mining focus area (Zone E) and the major constraints in this zone are quoted below:

> *Over-allocation of the water resources in this area is a definite constraint. The area is also drought prone. Not much arable land is available within this zone. The land most suitable for agriculture can be found southwest of Jane Furse. High erosion in this zone leads to a siltation problem within the rivers. This zone is largely rural in nature and has been classified as a presidential poverty node. Services and infrastructure are severely inadequate. Education within this zone is fairly low. Employment and income are also low in this area, mostly due to lack of the required skills available within the workforce. There is a high risk of desertification in this area because of the extensive removal of natural vegetation. The excessive harvesting of firewood further increases this risk. A large constraint is the potential future impact on mining and industrial activities on the natural vegetation and scenic environment. Pollution of water and air in this zone is a noticeable risk.*
>
> *Although some formal agriculture occurs in the zone, especially on the banks of the Olifants River and in a few valleys, the area is dominated by expansive areas of subsistence farming. The degradation of soil and erosion in the area has become critical. Desertification is a reality, and it is not possible to rehabilitate the expansive degraded area to its former state. The erosion and subsequent sediment transport in the river system has very significant negative effects of downstream areas and further reduces the water capacity of the system. The meagre subsistence crops that are produced remain important for the survival of the large rural population. The rural area is not capable of supporting its current population anymore and further agricultural development in the area would in all probability not be feasible.*

4.3 Site Visit

The site was visited from the 30th January to the 2nd of February 2023 in the summer during the rainy season. During the site visit the potential visual sensitivities were identified and general site views and vegetative screening assessed. For views from and towards the site, please refer to **Figure 4-1** below.

The photos show the vegetation cover that ranges from open grassland to woodland with patches of open grassland. The study area includes an industrial area (truck stop) and an adjacent lodge (Ecsal Lodge), both of which belong to the same landowner. The visual screening and the resultant viewshed are described in the sections below.

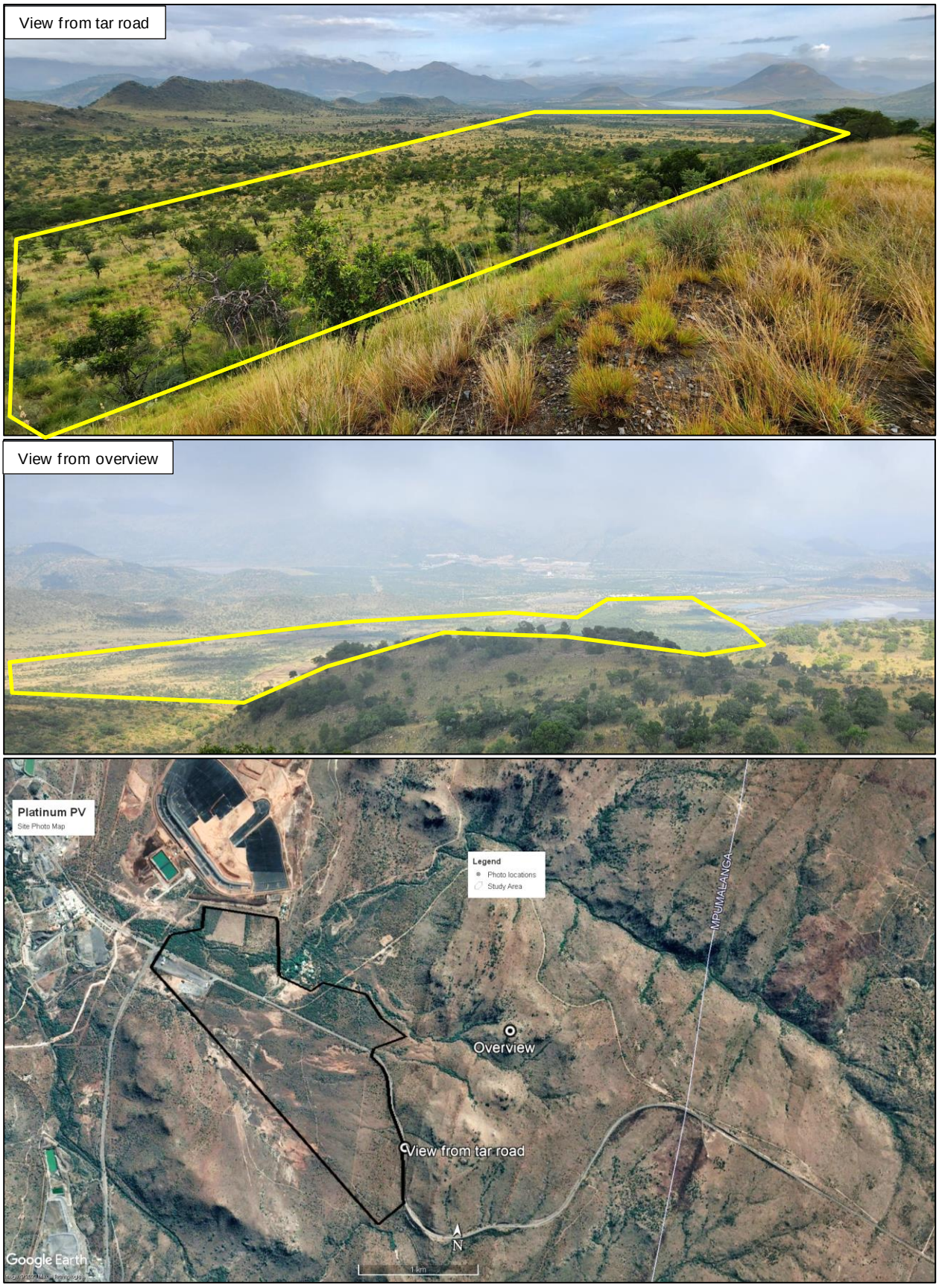


Figure 4-1: Views of the site (yellow area) and the area these photos were taken from

4.4 Vegetative Screening

A key part of the visual assessment is to understand the current level of visual screening available on site, to determine if the site has an inherent Visual Absorption Capacity (VAC) that should be taken into account in the impact assessment. Key examples of the vegetation screening available on site are shown in **Figure 4-2** on the following photo page.

Key observations include:

- Ridges and drainage lines are well vegetated.
- Trees provide very good screening, especially along tar road from Lydenburg and along Springkaanspruit valley bottom.
- General slopes include large sections dominated by grassland, with minimal screening.
- Erosion sheets have very little vegetative cover and provide no visual screening.

With the above in mind, the vegetative cover has the ability to absorb the visual impacts from parts of the development that will be located in the areas of taller trees, if those trees are not removed, however the shade from the trees will reduce the output capacity of the solar panels.

4.5 Landform Description

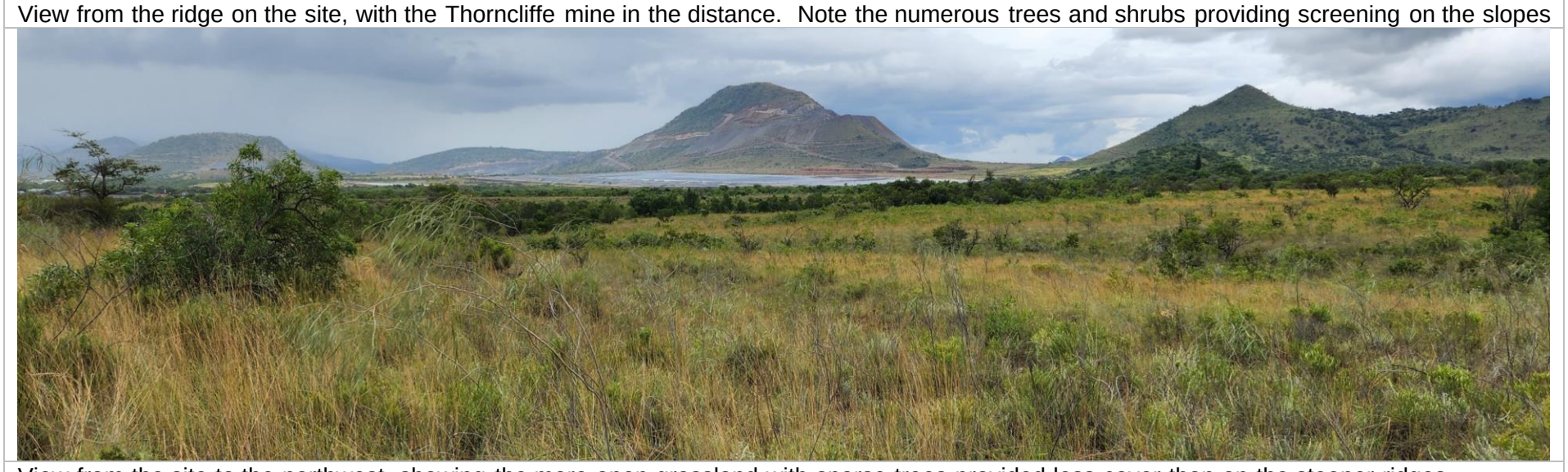
The proposed study area is located in the mountainous terrain south of the town of Steelpoort, within the Groot-Dwarsrivier valley. The terrain in the study area generally drains from east to west from the mountain ridge up to 2320 metres above mean sea level (mamsl) to the lowest point on the Groot-Dwarsrivier at 760 mamsl. The site ranges from 1300 mamsl on the eastern ridge, to the low point on the western boundary at 940 mamsl (see **Figure 4-3**).

The site is located on the midslope terrain unit with several ephemeral drainage lines running through the site as well as one non-perennial stream, the Springkaanspruit, in the north-western corner of the site.

The slope on site averages between 1 and 5 degrees, with the easternmost section going as steep as 25 degrees in the ridge (based on 20m contours).

View from the ridge on the site, with the Thorncliffe mine in the distance.

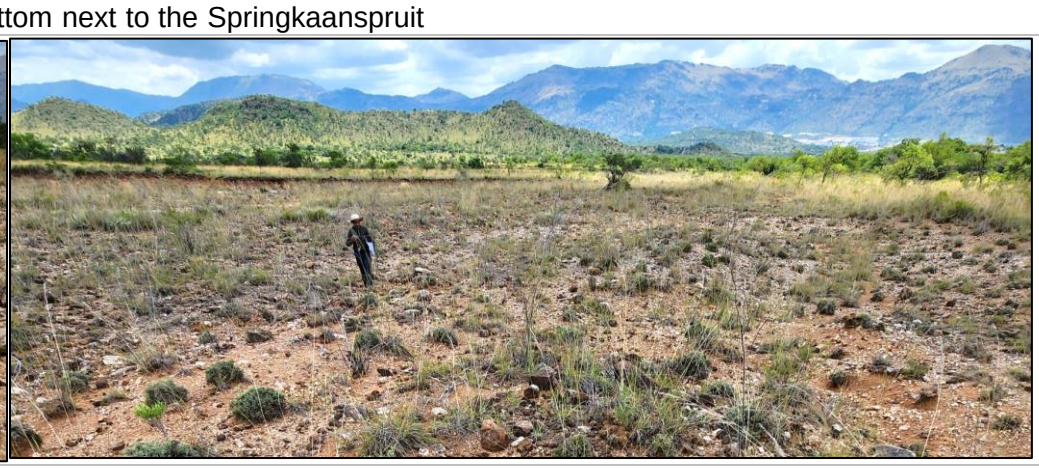
Note the numerous trees and shrubs providing screening on the slopes



View from the site to the northwest, showing the more open grassland with sparse trees provided less cover than on the steeper ridges

View from the northern part of the site towards the main road – note the effective visual screening of truck by trees

Excellent screening by numerous trees located along valley bottom next to the Springkaanspruit



Erosion sheets with very little vegetative cover and no screening

Figure 4-2: Photos of key visual screening aspects

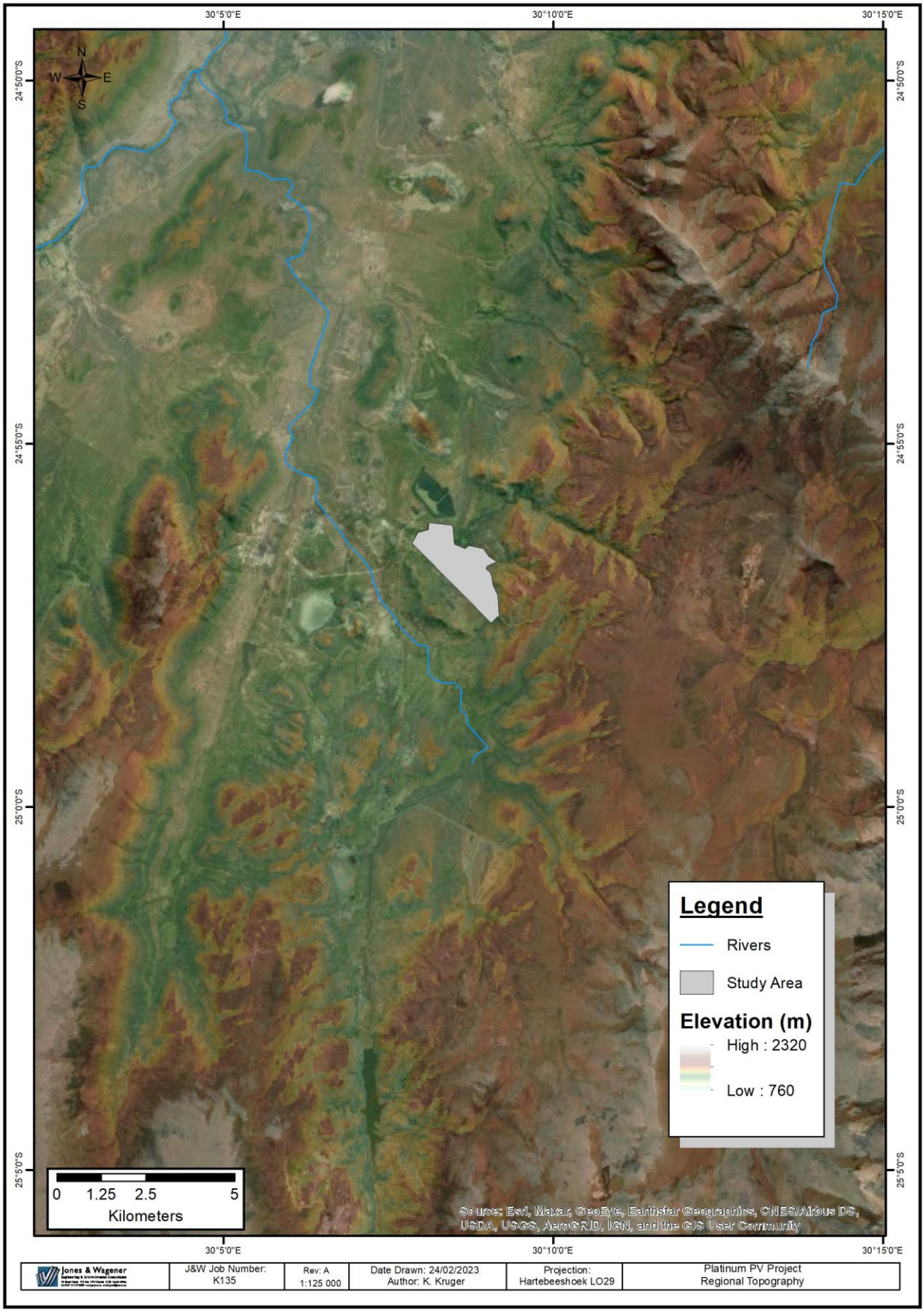


Figure 4-3: Regional Topography

4.6 Viewshed Description

Using the topography model, J&W assessed the potential viewshed of the study site. The first step involved the identification of the visual observers, which in the case of the study area, were focussed on mines and guesthouses. The identified observers are shown in **Figure 4-4** and **4-5** as points on the maps.

The bulk of the adjacent properties are owned by mining companies that mine platinum and chrome. The main surrounding mining complexes include:

- Thorncliffe
- Dwarsrivier
- Two Rivers Platinum
- Lebowa Mine
- Magareng Mine
- Borwa Mine
- Mototolo
- Samancor Tweefontein, and
- BCR Mine

Servicing the mines are several lodges and guesthouses, the closest being the Ecsal Lodge, just to the north of the study site.

The second step of the assessment requires the analysis of the project area in terms of the potential visibility to the receiving area. In the baseline report, that assessment was limited to the potential viewshed from the site i.e., assuming no visual screening, and no structures have been established, from where can the site be observed.

It is important to note that during the impact assessment the modelling will be taken further, adding the height of the proposed structures and including the effect of distance on visual impact. However, the current viewshed using just the site topography is shown in **Figure 4-5**. From the map it can be seen that the proposed site viewshed is limited to areas around the site and on the opposite side of the valley. The bulk of the lodges and guest houses are unaffected.

4.7 Landcover Description

The land cover of the study area is presented in **Figure 4-6** and is based on the 2020 National Landcover Database as published by the DFFE. The figure shows that the land cover on site is dominated by eroded areas, grassland and woodland. The truck stop has been classified as mining/industrial and no residential structures are found on the proposed site.

It should be noted that the Ecsal Lodge is located immediately adjacent to the study area, in the northern part of the farm.

In terms of visual screening, the vegetative cover in the grassland section is relatively short (refer to photos in **Figure 4-1**), and any structure taller than 2m will be visible from the surrounding landscape. The woodland section, however, has significantly better screening and could potentially reduce the visual impact of the proposed development.

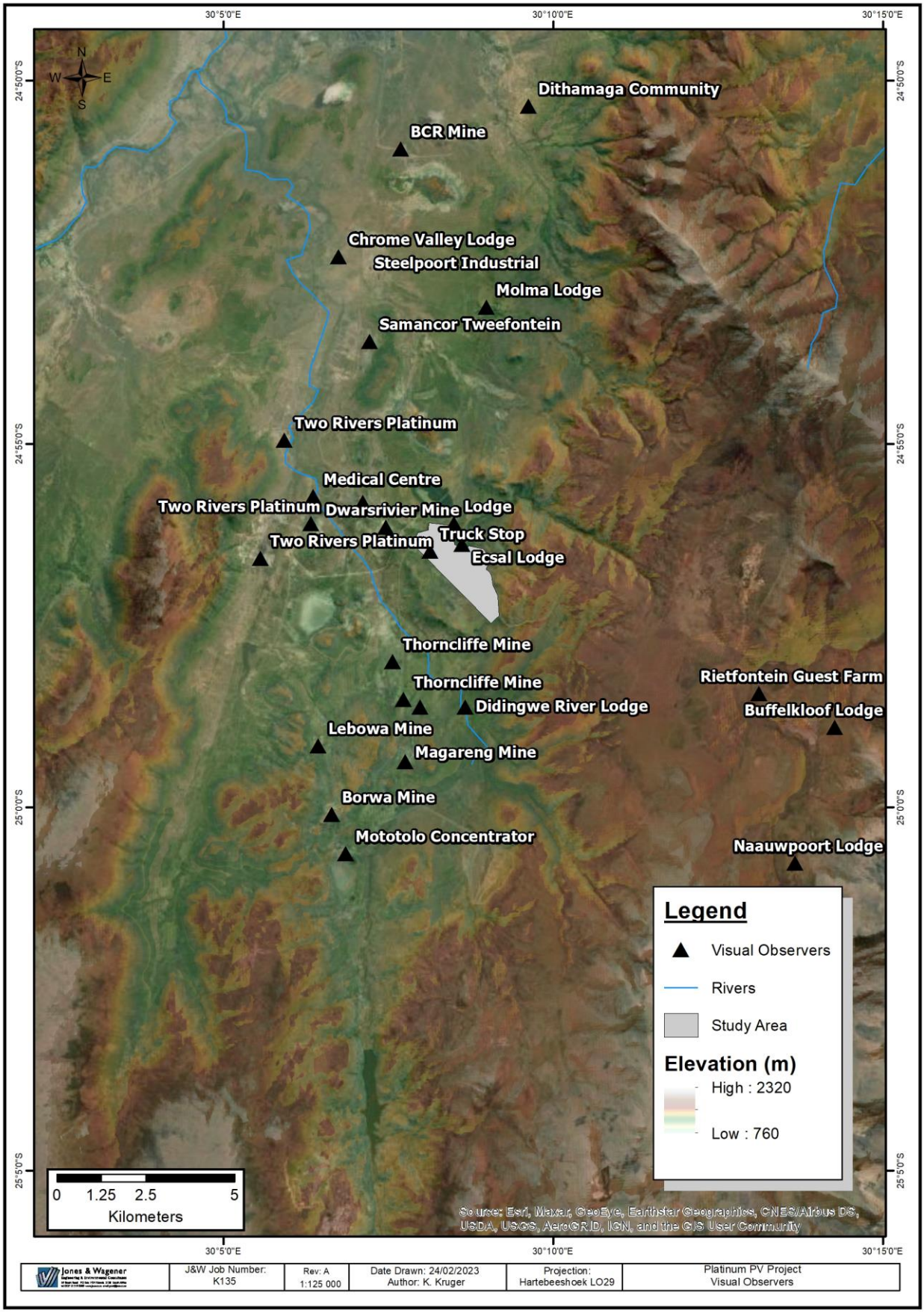


Figure 4-4: Visual Observers Identified on Site

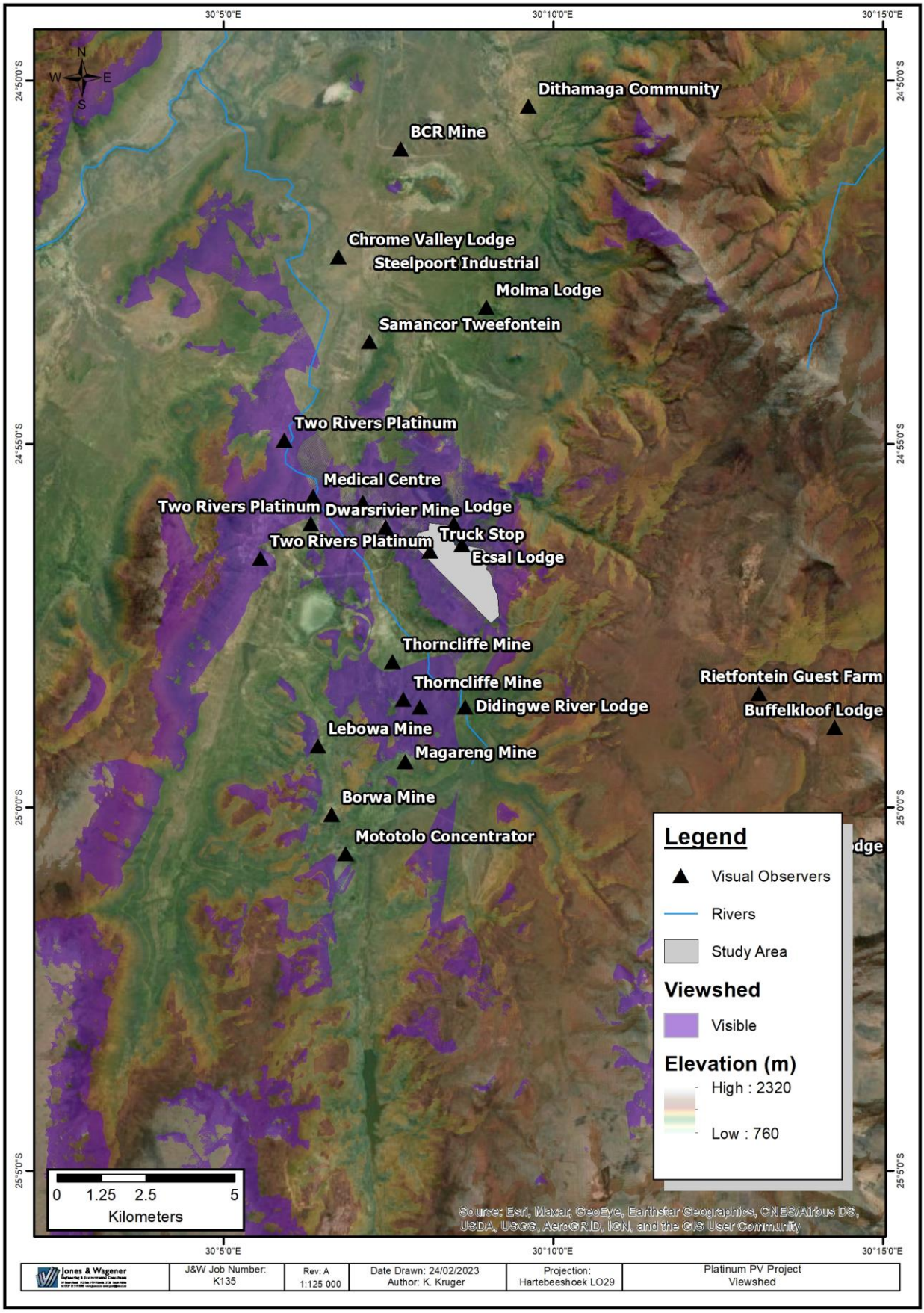


Figure 4-5: Viewshed Baseline Map

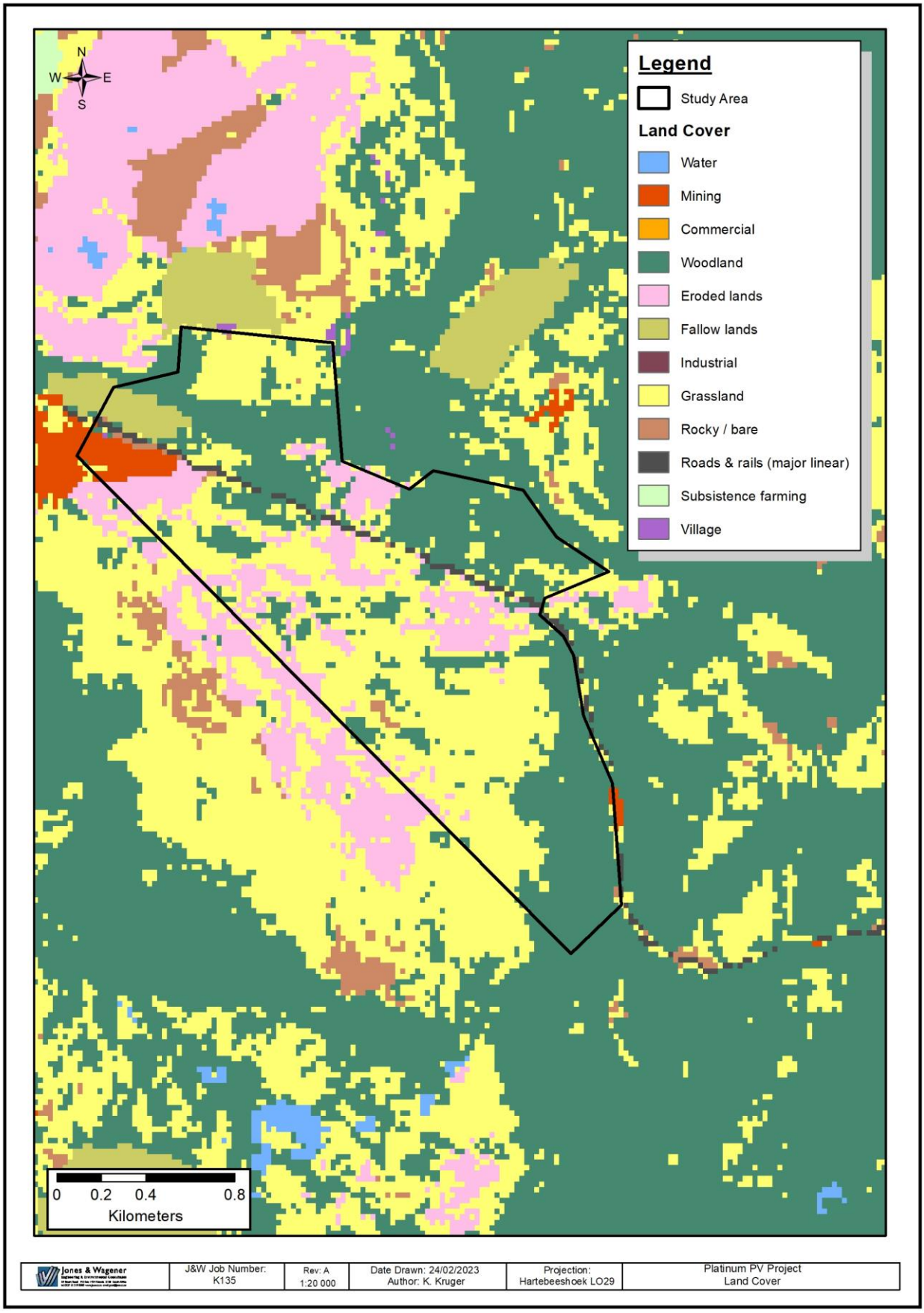


Figure 4-6: Landcover of the study area (DFFE, 2020)

5. IMPACT ASSESSMENT METHODOLOGY

In order to ensure uniformity, a standard impact assessment methodology will be utilised so that a wide range of impacts can be compared. The impact assessment methodology makes provision for the assessment of impacts against the following criteria:

- Significance;
- Spatial scale;
- Temporal scale;
- Probability; and
- Degree of certainty.

A combined quantitative and qualitative methodology will be used to describe the impacts for each of the aforementioned assessment criteria. A summary of each of the qualitative descriptors along with the equivalent quantitative rating scale for each of the aforementioned criteria is given in **Table 5-1**.

Table 5-1: Quantitative rating and equivalent descriptors for the impact assessment criteria.

RATING	SIGNIFICANCE	EXTENT SCALE	TEMPORAL SCALE
1	VERY LOW	*Isolated corridor / proposed corridor*	Incidental
2	LOW	*Study area*	Short-term
3	MODERATE	*Local*	Medium-term
4	HIGH	*Regional / Provincial*	Long-term
5	VERY HIGH	*Global / National*	Permanent

A more detailed description of each of the assessment criteria is given in the following sections.

5.1 Significance Assessment

Significance rating (importance) of the associated impacts embraces the notion of extent and magnitude, but does not always clearly define these since their importance in the rating scale is very relative. For example, the magnitude (i.e. the size) of area affected by atmospheric pollution may be extremely large (1000km^2) but the significance of this effect is dependent on the concentration or level of pollution. If the concentration is great, the significance of the impact would be HIGH or VERY HIGH, but if it is diluted it would be VERY LOW or LOW. Similarly, if 60 ha of a grassland type are destroyed the impact would be VERY HIGH if only 100 ha of that grassland type were known. The impact would be VERY LOW if the grassland type was common. A more detailed description of the impact significance rating scale is given in **Table 5-2** below.

Table 5-2: Description of the significance rating scale.

RATING		DESCRIPTION
5	VERY HIGH	Of the highest order possible within the bounds of impacts which could occur. In the case of adverse impacts: there is no possible mitigation and/or remedial activity which could offset the impact. In the case of beneficial impacts, there is no real alternative to achieving this benefit.
4	HIGH	Impact is of substantial order within the bounds of impacts, which could occur. In the case of adverse impacts: mitigation and/or remedial activity is feasible but difficult, expensive, time-consuming or some combination of these. In the case of beneficial impacts, other means of achieving this benefit are feasible but they are more difficult, expensive, time-consuming or some combination of these.
3	MODERATE	Impact is real but not substantial in relation to other impacts, which might take effect within the bounds of those which could occur. In the case of adverse impacts: mitigation and/or remedial activity are both feasible and fairly easily possible. In the case of beneficial impacts: other means of achieving this benefit are about equal in time, cost, effort, etc.
2	LOW	Impact is of a low order and therefore likely to have little real effect. In the case of adverse impacts: mitigation and/or remedial activity is either easily achieved or little will be required, or both. In the case of beneficial impacts, alternative means for achieving this benefit are likely to be easier, cheaper, more effective, less time consuming, or some combination of these.
1	VERY LOW	Impact is negligible within the bounds of impacts which could occur. In the case of adverse impacts, almost no mitigation and/or remedial activity is needed, and any minor steps which might be needed are easy, cheap, and simple. In the case of beneficial impacts, alternative means are almost all likely to be better, in one or a number of ways, than this means of achieving the benefit. Three additional categories must also be used where relevant. They are in addition to the category represented on the scale, and if used, will replace the scale.
0	NO IMPACT	There is no impact at all - not even a very low impact on a party or system.

5.2 Spatial Scale

The spatial scale refers to the extent of the impact i.e. will the impact be felt at the local, regional, or global scale. The spatial assessment scale is described in more detail in **Table 5-3**.

Table 5-3: Description of the significance rating scale.

RATING		DESCRIPTION
5	Global/National	The maximum extent of any impact.
4	Regional/Provincial	The spatial scale is moderate within the bounds of impacts possible, and will be felt at a regional scale (District Municipality to Provincial Level). The impact will affect an area up to 50km from the proposed site / corridor.
3	Local	The impact will affect an area up to 5km from the proposed route corridor / site.
2	Study Area	The impact will affect a route corridor not exceeding the boundary of the corridor / site.
1	Isolated Sites / proposed site	The impact will affect an area no bigger than the corridor / site.

5.3 Duration Scale

In order to accurately describe the impact it is necessary to understand the duration and persistence of an impact in the environment. The temporal scale is rated according to criteria set out in **Table 5-4**.

Table 5-4: Description of the temporal rating scale.

RATING		DESCRIPTION
1	Incidental	The impact will be limited to isolated incidences that are expected to occur very sporadically.
2	Short-term	The environmental impact identified will operate for the duration of the construction phase or a period of less than 5 years, whichever is the greater.
3	Medium term	The environmental impact identified will operate for the duration of life of the project.
4	Long term	The environmental impact identified will operate beyond the life of operation.
5	Permanent	The environmental impact will be permanent.

5.4 Degree of Probability

The probability or likelihood of an impact occurring will be described, as shown in **Table 5-5** below.

Table 5-5: Description of the degree of probability of an impact occurring.

RATING	DESCRIPTION
1	Practically impossible
2	Unlikely
3	Could happen
4	Very Likely
5	It's going to happen / has occurred

5.5 Degree of Certainty

As with all studies it is not possible to be 100% certain of all facts, and for this reason a standard "degree of certainty" scale is used as discussed in **Table 5-6**. The level of detail for specialist studies is determined according to the degree of certainty required for decision-making. The impacts are discussed in terms of affected parties or environmental components.

Table 5-6: Description of the degree of certainty rating scale.

RATING	DESCRIPTION
Definite	More than 90% sure of a particular fact.
Probable	Between 70 and 90% sure of a particular fact, or of the likelihood of that impact occurring.
Possible	Between 40 and 70% sure of a particular fact, or of the likelihood of an impact occurring.
Unsure	Less than 40% sure of a particular fact or the likelihood of an impact occurring.
Can't know	The consultant believes an assessment is not possible even with additional research.

5.6 Quantitative Description of Impacts

To allow for impacts to be described in a quantitative manner in addition to the qualitative description given above, a rating scale of between 1 and 5 was used for each of the assessment criteria. Thus the total value of the impact is described as the function of significance, spatial and temporal scale as described below.

$$\textit{Impact Risk} = \frac{(\text{SIGNIFICANCE} + \textit{Spatial} + \text{Temporal})}{3} \times \frac{\text{Probability}}{5}$$

An example of how this rating scale is applied is shown in **Table 5-7**.

Table 5-7: Example of Rating Scale.

IMPACT	SIGNIFICANCE	SPATIAL SCALE	TEMPORAL SCALE	PROBABILITY	RATING
	LOW	*Local*	Medium Term	*Could Happen*	
Impact to air	**2**	***3***	**3**	**3**	**1.6**

Note: The significance, spatial and temporal scales are added to give a total of 8, that is divided by 3 to give a criteria rating of 2,67. The probability (3) is divided by 5 to give a probability rating of 0,6. The criteria rating of 2,67 is then multiplied by the probability rating (0,6) to give the final rating of 1,6.

The impact risk is classified according to 5 classes as described in **Table 5-8**.

Table 5-8: Impact Risk Classes.

RATING	IMPACT CLASS	DESCRIPTION - NEGATIVE	DESCRIPTION - POSITIVE
0.1 – 1.0	1	Very Low	Very Low
1.1 – 2.0	2	Low	Low
2.1 – 3.0	3	Moderate	Moderate
3.1 – 4.0	4	High	High
4.1 – 5.0	5	Very High	Very High

Therefore, with reference to the example used for air quality above, an impact rating of 1.6 will fall in the Impact Class 2, which will be considered to be a low impact.

6. IMPACT ASSESSMENT

Each of the project phases are described and assessed separately below. This includes the current state prior to development, the additional impact of the proposed development on its own, the cumulative impact of the two combined, proposed mitigation measures required and finally the residual impact once the mitigation measures have been implemented. For a summary of the impact assessment please refer to **Table 6-1** below.

6.1 Current State (Initial Impact)

The visual baseline assessment found that the viewshed of the site is relatively small due to the mountainous landscape. At present the sense of place on the study site is largely natural and rural with isolated development. The visual absorption capacity ranges from high to none depending on the vegetative cover as described in Section 4.4. The larger valley has seen a significant increase in mining activities, with over 12 new mines / shafts established in the last 10 years. These mining and industrial activities have significantly altered the visual landscape by mining several of the ridges for chrome. For present views from the site, refer to **Figure 6-1** below.

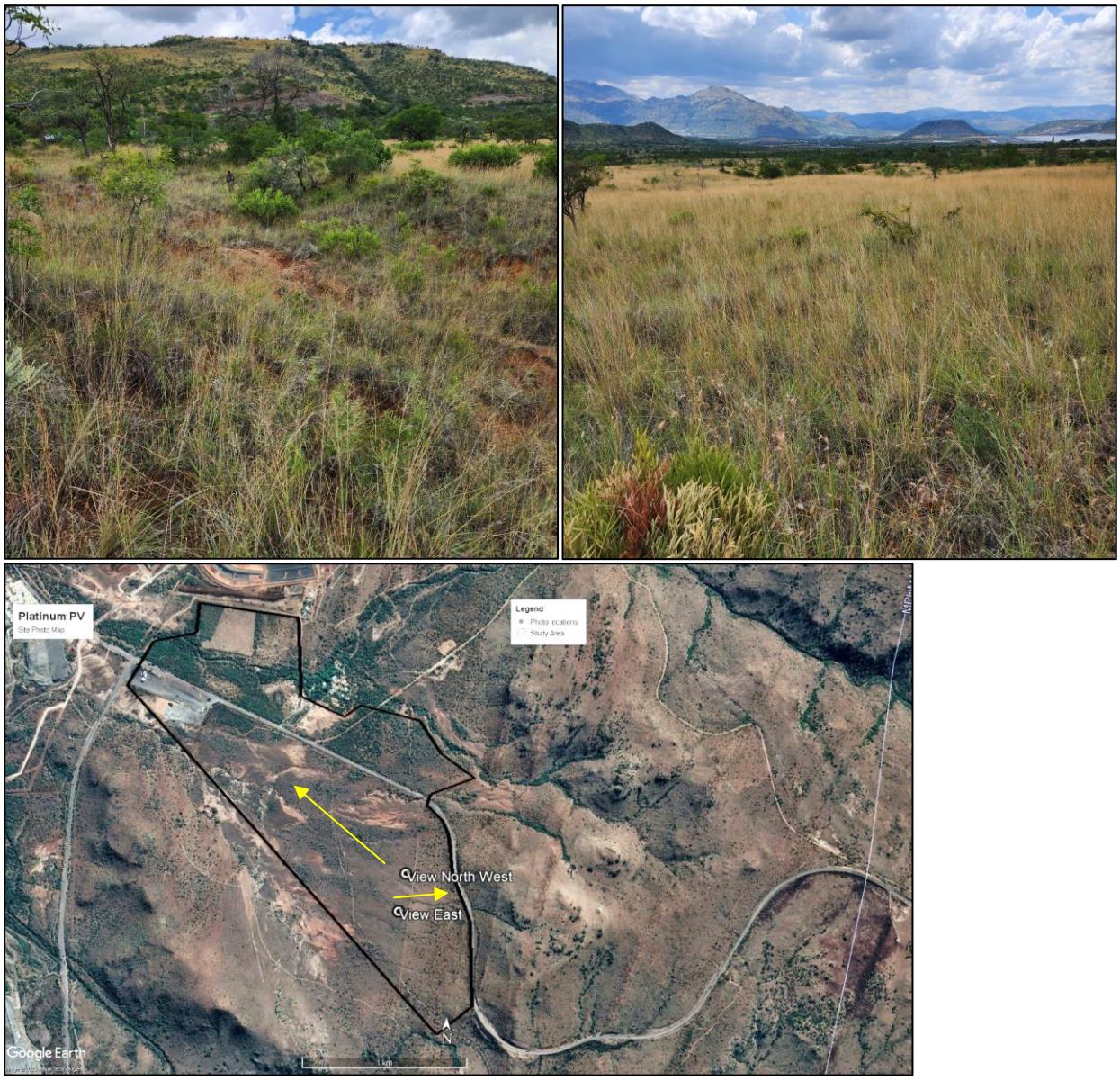


Figure 6-1: Views from the site to the east (left) and west (right)

As evident from the photos, the visual screening on site is varied due to the location of the trees as shown in **Figure 4-2**. Visual impacts on site include the truck stop, offices, the guest lodge, borrow pits and the erosion scars.

The initial visual impact on site is rated as a LOW impact on *isolated sites* over the long-term. This impact is *currently occurring* in terms of probability. The resultant impact rating is definitely a MODERATE impact.

6.2 Additional Impact from development

The proposed solar project will aim to generate up to 130 MW of renewable energy through the use of solar PV systems mounted on either a single axis tracking or a fixed structure. In addition, the site will include a Battery Energy Storage System (BESS) to store energy for use when the sun is not available (night-time) as well as an on-site substation to transmit the power to the electrical grid.

The transmission and distribution power lines are subject to a separate EA application.

The details of all the infrastructure and project components are given in Section 1.5 and shown in **Figure 6-2**.

6.2.1 Construction Phase

During construction a dedicated laydown area will be utilised for the materials and equipment required. The laydown/staging area on-site will be in front of mounting structures during installation. The proposed temporary store area is located west of the proposed BESS area with a footprint of approximately 0.93 ha (dark blue polygon in **Figure 6-2**).

In terms of impacts to visual environment the main impacts will be the site clearance, construction of internal roads, the construction of the solar panel modules, the BESS and substation and the associated O&M building. The O&M building will be located at the area named 'Site Buildings' (light blue polygon in **Figure 6-2**) near the substation and battery areas or at the western-most side of Section 1. The estimated size of the building is 600m², excluding parking. In summary the following impact footprints and heights will be developed (shown in **Figure 6-2**):

- Internal roads (up to 27km, 5m wide) up to 13.5ha
- Solar panels up to ~180ha (3m high)
- On-site sub and BESS complex up to ~3ha (3.5m high)
- Construction laydown area ~1ha
- Site buildings 0.75ha area – assumed 3m high
- Fencing around substation 2.5 – 3m high
- Total anticipated footprint ~200ha

The land use that dominates the project area is grazing and wilderness, and it has been confirmed with the landowner that the grazing activities previously undertaken on site have been relocated to the remainder of the farm and would not be impacted. The change from a grassland/bushveld sense of place to semi-industrial will affect more than 30% of the total farm.

The potential visual impact from each of the main project component such as the solar panels, the BESS and Substation were modelled using the footprints given above and the result from the visual modelling is shown in **Figures 6-3 to 6-5**.

From the modelling results it can be seen that the very mountainous topography that surrounds the study site limits the modelled visual impact to the areas directly adjacent to the proposed development and the high-lying ridges to the west of the site with isolated views from other high points. Please note the modelled views do not take visual screening by vegetation into account. In terms of existing observer locations that will potentially be impacts, low views can be expected at Thorncliffe mine and surrounds, high views around the Two Rivers Platinum mine as well as Ecsal Lodge (on the same property as the development). The main tourism sites such as Didingwe, Rietfontein guest farm, Buffelkloof, Nauwpoort, Molma and Chrome Valley will not be visually impacted. The closest community at Dithamaga will also not be affected. There are no views along the R555, but the R577 Lydenburg tar road that traverses past the site will be impacted. The range of impact is largely within 10 km of the site. When the vegetative screening is taken into account, the impact to the lodge is reduced.

The construction activities will be short-term in duration and moving around the site as required. Any night-time lighting can also create an additional impact.

The additional direct impact rating during construction is probably a HIGH negative impact on the *local area* over the short-term. This impact *is going to happen* in terms of probability. The resultant impact rating is a MODERATE impact. Although there is a variation in the extent of the visual impact between the project components (PV modules, BESS and substation), this difference is not significant enough to change the impact rating, and they are therefore rated equal.

6.2.2 Operational Phase

During operations the impacts to the solar panels and associated buildings will be completed and operational. The amount of vehicle and personnel movement on site will have reduced from construction. The main additional visual impact from this phase includes possible reflection or glinting from reflective surfaces onto nearby observers, especially if the vegetative cover is bare. The extent of glinting is far less than the total visual impact, as the observer has to be at a specific angle to the reflective object and precise time of day to experience the impact. As the surrounding study area is very sparsely inhabited, the additional impact from glinting on static observers is regarded as negligible in comparison to the overall visual impact. There is a potential for the panels to produce glinting towards the R577, depending on the angle of the sun and the time of day. Night-time lighting can also create an additional impact as indicated in the construction phase.

The additional impact during the operations is probably a HIGH negative impact on the *local area* over the medium-term. This impact *is going to happen* in terms of probability. The resultant impact rating is a HIGH impact.

6.2.3 Decommissioning Phase

During the decommissioning phase the structures listed above will be removed from the site. The activities will be very similar to the construction phase, with a team of workers on-site dismantling structures and repairing disturbed footprints. As these activities are so similar to the construction phase, the impact assessment is rated the same.

The additional impact rating during decommissioning is probably a HIGH negative impact on the *local area* over the short-term. This impact *is going to happen* in terms of probability. The resultant impact rating is a MODERATE impact.

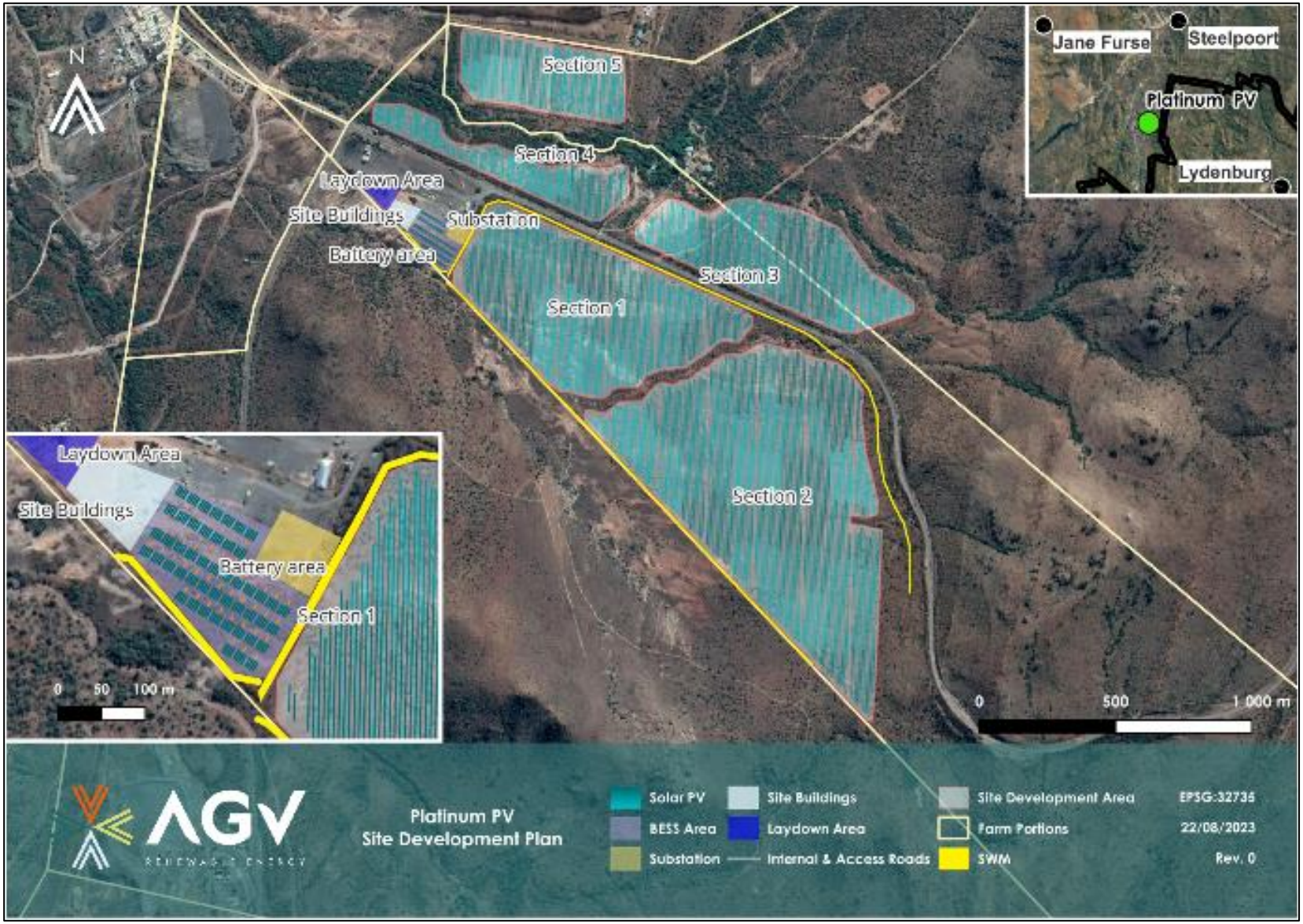


Figure 6-2: Site Components Steelpoort Solar PV (Source AGV)

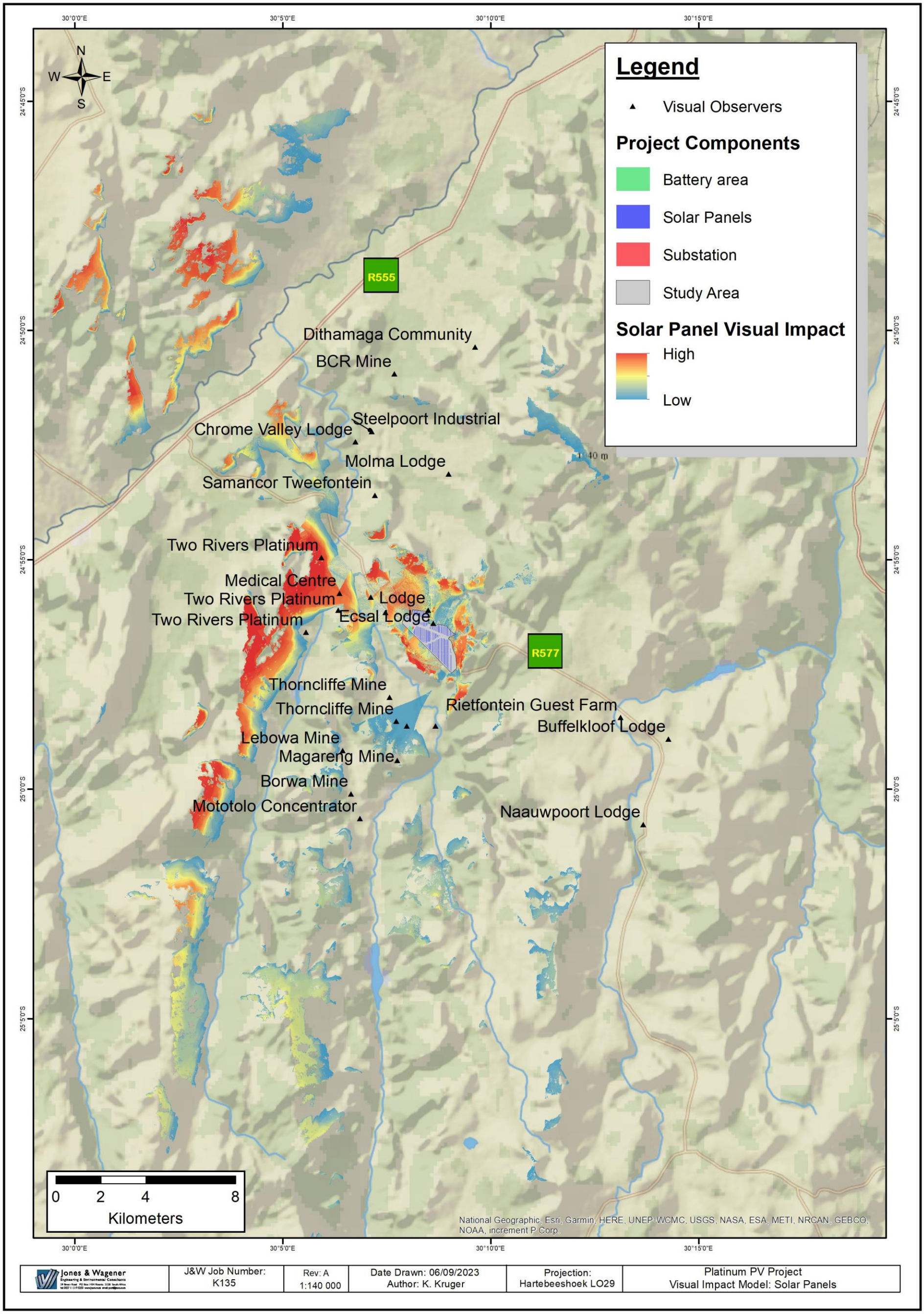


Figure 6-3: Visual Impact Phula PV Solar Panels

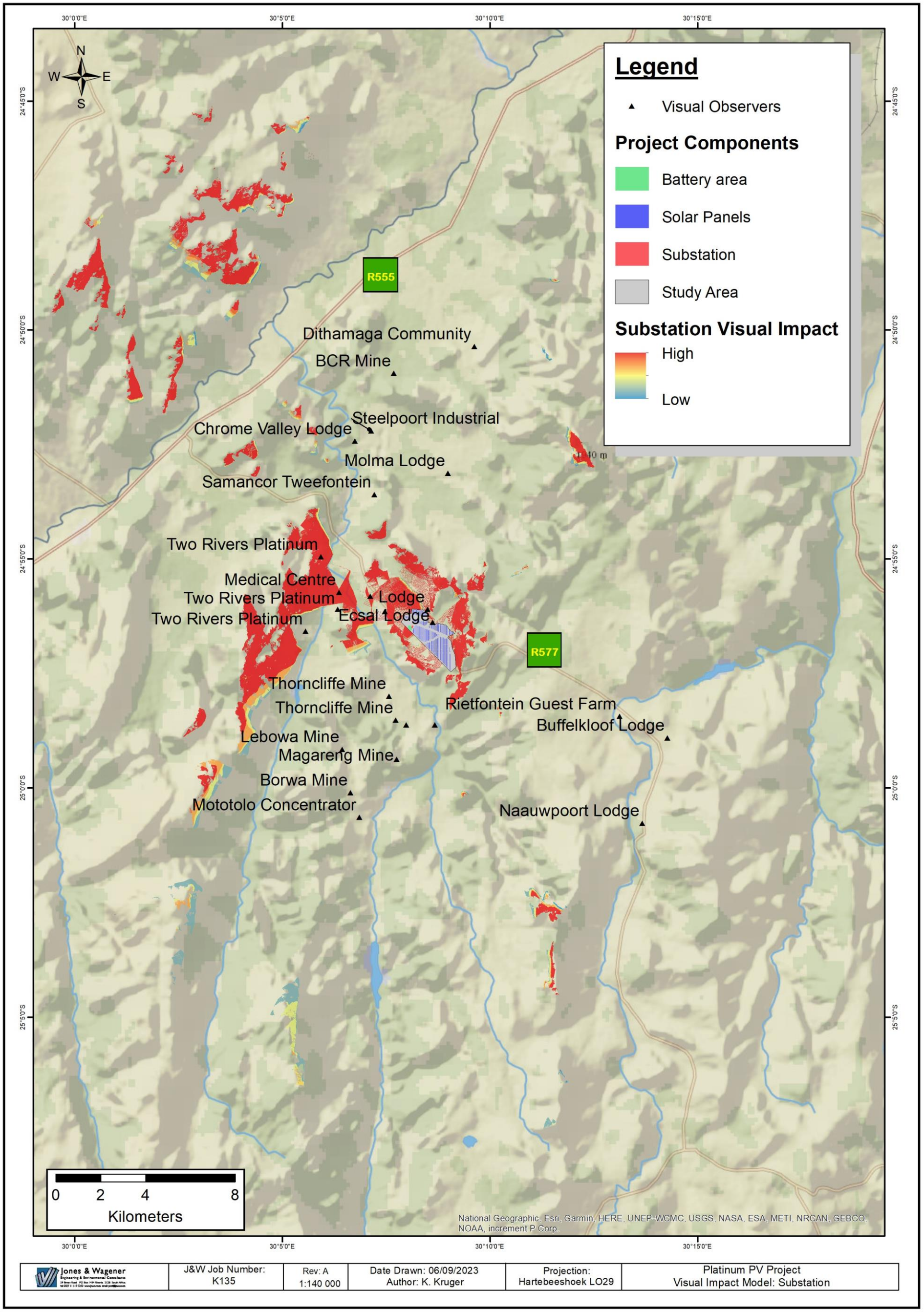


Figure 6-4: Visual Impact Phula PV Substation

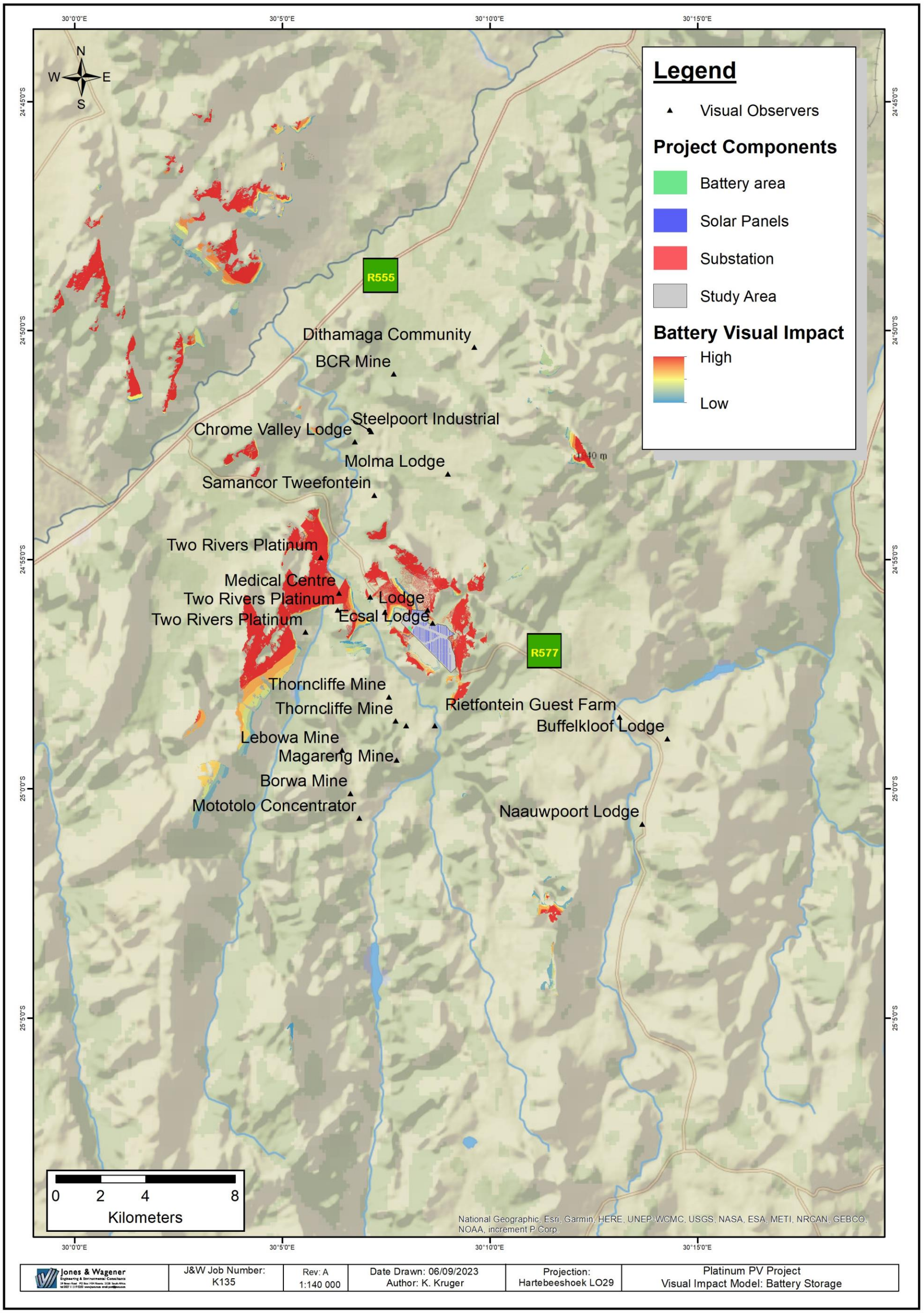


Figure 6-5: Visual Impact Phula PV Battery Storage

6.2.4 Post-closure Phase

Post closure the site will be returned to the farmer and the impacted footprints returned to the pre-development state i.e. grazing land. This will be a positive impact as the sense of place will be returned to rural natural land that will be utilised for agricultural purposes.

The additional impact rating post-closure is assessed as a HIGH positive impact on *the local area* over the long-term. This positive impact is *very likely* in terms of probability. The resultant impact rating is probably a MODERATE positive impact.

6.3 Cumulative Impact

The cumulative impact assessment considers the impacts of the proposed development in combination with the existing background impacts.

6.3.1 Construction Phase

During construction, the cumulative impact will not increase in terms of significance or duration. However, the spatial extent will increase but not to the extent that the impact will be experienced 50km from the site, which is the next impact category. The construction phase impact rating remains a MODERATE impact however the certainty increases from probable to definite.

6.3.2 Operational Phase

The cumulative operational visual impact of the proposed project along with the existing impact from the mining projects in the valley remains a HIGH impact with the certainty increasing from probable to definite.

6.3.3 Decommissioning Phase

As rated above for the construction phase in Section 6.3.1.

6.3.4 Post-closure phase

The positive impacts from returning the land to grazing land remains a MODERATE positive impact. The impact certainty increases from possible to probable.

6.4 Mitigation measures

The above impact assessments were conducted assuming that no mitigations are in place. This section aims to identify those mitigations that could potentially either reduce the impact significance, duration, spatial extent or reduce the probability of the impact occurring. The following mitigation measures are proposed for the various development phases:

6.4.1 Construction and Decommissioning

- Only clear areas required for the proposed project.
- Ensure that large trees are retained as far as possible, especially along the perimeter of each of the development sections and the R577 tar road.
- Limit vehicle movement to dedicated access roads as far as possible.
- If dust entrainment becomes a visible issue, consider addressing through use of a water cart (if water availability allows). If water is too scarce, consider chemical treatments on roads to avoid dust.
- Keep a stakeholder register of all impacts to track issues that require further mitigation.
- Ensure all heavy machinery is contained within the lay-down areas when not in use and regularly serviced to avoid smoke.
- No fires permitted on site.
- Ensure that construction waste is regularly collected and contained within the laydown areas and not creating a visual impact.
- Burying of any waste including domestic waste, empty containers on the site should be strictly prohibited and all waste must be removed to an approved disposal site.
- Limit night-time lighting to avoid light pollution of nearby lodges and guest houses, unless it is required for security purposes.

6.4.2 Operations

- As above for construction
- Ensure solar panels selection considers less reflective surfaces where possible.
- Ensure vegetation is allowed to establish where possible to avoid bare surfaces.
- Avoid bare metal surfaces / roofs where possible.
- Avoid clearing of shrubs and trees adjacent to the boundaries of the development to assist with visual screening.

6.4.3 Post-closure

- Ensure the disturbed footprints are returned to land that can support grazing practices and per the current farming practices.
- If bare areas are apparent, re-seed with indigenous seed mix relevant to the study area.

6.5 Residual Impact (post mitigation)

The residual impact assessment aims to assess the impacts including the mitigation measures proposed above. This is assessed for each of the development phases.

6.5.1 Construction Phase

It was noted in the baseline section that the existing vegetation does provide varying levels of screening and thus the significance of the impact can be lower than assessed above. With the successful implementation of the above mitigation measures, especially limiting the vegetation clearance along the site perimeter, the significance of the residual impact during the construction phase can be reduced to a MODERATE significance with the spatial, temporal and probability ratings remaining the same. The impact will probably rate as a MODERATE residual impact.

6.5.2 Operational Phase

With the successful implementation of the above mitigation measures, especially limiting the vegetation clearance and glinting, the significance of the residual impact during the operational phase can be reduced to a MODERATE significance with the spatial, temporal and probability ratings remaining the same. The impact will probably reduce from HIGH to a MODERATE residual impact.

6.5.3 Decommissioning Phase

As rated above for the construction phase in Section 6.5.1.

6.5.4 Post-closure Phase

With the addition of the proposed mitigations the probability of the positive impact increases from *very likely to definite*. The resultant post-closure residual impact is probably increased to a HIGH positive impact.

Table 6-1: Impact Assessment Summary Table

Activity	Aspect	Impact	Mitigation	Criteria	Rating prior to project (Initial Impact)	Rating prior to mitigation (Additional Impact)	Cumulative rating	Rating post mitigation (Residual Impact)
Construction Phase								
Site preparation and construction earthmoving	Visual	**NEGATIVE IMPACT** Direct visual impact Change in sense of place	• Only clear areas required for the proposed project. • Ensure that large trees are retained as far as possible, especially along the perimeter of each of the development sections and the R577 tar road. • Limit vehicle movement to dedicated access roads as far as possible. • If dust entrainment becomes a visible issue, consider addressing through use of a water cart (if water availability allows). If water is too scarce, consider chemical treatments. • Keep a stakeholder register of all impacts to track issues that require further mitigation. • Ensure all heavy machinery is contained within the lay-down areas when not in use and regularly serviced to avoid smoke. • No fires permitted on site. • Ensure that construction waste is regularly collected and contained within the laydown areas and not creating a visual impact • Burying of any waste including domestic waste, empty containers on the site should be strictly prohibited and all waste must be removed to an approved disposal site. • Limit night-time lighting to avoid light pollution of nearby lodges and guest houses, unless it is required for security purposes.	Significance Spatial Temporal Probability Certainty	2 1 4 5 **Definite**	**MEDIUM**	4 3 2 5 **Probable**	**MEDIUM**	4 3 2 5 **Definite**	**MEDIUM**	3 3 2 5 **Probable**	**MEDIUM**
Operational / Maintenance Phase								
Site operations **Presence of operational Solar PV units, BESS and Substation**	Visual	**NEGATIVE IMPACT** Direct visual impact Change in sense of place Glare/reflection from panels	• As above for construction • Ensure solar panels selection considers less reflective surfaces where possible • Ensure vegetation is allowed to establish where possible to avoid bare surfaces • Avoid bare metal surfaces / roofs where possible • Avoid clearing of shrubs and trees adjacent to the boundaries of the development to assist with visual screening	Significance Spatial Temporal Probability Certainty	3 1 4 5 **Definite**	**MEDIUM**	4 3 3 5 **Probable**	**HIGH**	4 3 3 5 **Definite**	**HIGH**	3 3 3 5 **Probable**	**MEDIUM**
Decommissioning phase								
Decommissioning of infrastructure	Visual	**NEGATIVE IMPACT** Direct visual impact	• As above for construction	Significance Spatial Temporal Probability Certainty	3 1 4 5 **Definite**	**MEDIUM**	4 3 2 5 **Probable**	**MEDIUM**	4 3 2 5 **Probable**	**MEDIUM**	3 3 2 5 **Will occur**	**MEDIUM**
Post Closure phase								
Post closure – land returned to grazing	Visual	**POSITIVE IMPACT** Re-establishing grazing land where possible	• Ensure the disturbed footprints are returned to land that can support grazing practices and per the current farming practices. • If bare areas are apparent, re-seed with indigenous seed mix relevant to the study area.	Significance Spatial Temporal Probability Certainty	3 1 4 5 **Definite**	**MEDIUM**	4 3 4 4 **Possible**	**MEDIUM +**	4 3 4 4 **Probable**	**MEDIUM +**	2 2 3 5 **Probable**	**HIGH +**

7. SPECIALIST OPINION

In Section 2 of this report, it was noted that the DFFE Screening Tool identified high sensitivities in relation to the slopes on site. This report has found that the screening sensitivity was an accurate reflection of the slopes on site, but it should be noted that the slope was not deemed a sensitivity by the proponent.

It is the opinion of this specialist that the proposed Phula PV development can be authorised from a visual perspective. The impacts identified are within the acceptable norms for the type of development, and the applicant has avoided all sensitivities as far as reasonably possible. The visual impact of a solar project is unavoidable and is compensated by the positive impact that green energy generation will have on the region and country. By limiting the vegetative clearing along the site perimeter and considering the background visual impacts from mining and the related infrastructure, the High cumulative impact can be mitigated to a Medium residual impact. The mitigation measures recommended in Section 5.4 above should be considered for inclusion in the EMPr and any associated authorisation.

8. REFERENCES

DFFE. 2020. GN 320 Specialist Protocols. *Government Notice, Government Gazette.*

DFFE. 2018. "National Land Cover Database South Africa." Database.

Environomics. 2009. Environmental Management Framework for the Olifants and Letaba Rivers Catchment Areas (OLEMF). *EMF, DFFE.*

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for Jones & Wagener

28 September 2023

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APPENDIX A

SPECIALIST CV

APPENDIX B

DECLARATION OF INDEPENDENCE