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Environmental Consultants

Impact Assessments - Environmental Management Programs - Compliance Monitoring - Process Review

SITE SENSITIVITY VERIFICATION REPORT FOR THE PROPOSED PAARDE VALLEY PV2 SWITCHING STATION, 132KV OVERHEAD POWERLINE TO VETLAAGTE MAIN TRANSMISSION SUBSTATION (MTS), AND ASSOCIATED INFRASTRUCTURE, NEAR DE AAR, NORTHERN CAPE PROVINCE: BASIC ASSESSMENT PROCESS

DFFE Ref: TBC

JUNE 2022

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1 Introduction and Background

Paarde Valley PV2 (Pty) Ltd (hereafter referred to as the Applicant) proposes the construction of a 132 kV, double circuit, overhead powerline (OHPL) grid connection from the authorised on-site substation and switching station at the Paarde Valley PV2 solar energy facility to the Vetlaagte Main Transmission Station (MTS) (which is currently undergoing its own separate Environmental Authorisation (EA) application process), near De Aar in the Northern Cape Province. The proposed OHPL would be approximately 12.7 km in length, and is located entirely within an Electricity Grid Infrastructure (EGI) Strategic Transmission Corridor, i.e. in the Central Corridor¹. A 200 m corridor (100 m of each side of the line) has been assessed. The final OHPL servitude will be registered as 31 m but during the design development process a corridor of 200 meters is required to allow for minor tower position adjustments. The exact pylon locations will be determined by the outcome of the specialist's investigations, and engineering considerations during detailed design. On average there will be 4 - 5 towers per kilometre, so that the route will consist of approximately 40 towers. The teams constructing the OHPL often use cranes and these will fit into an area with a maximum radius of approximately 30 m around the base of each tower, with the final footprint being relatively small. The line will have a capacity of 132kV and will make use of either steel monopole or steel lattice structure in line with Eskom required specifications.

A monopole self-supporting structure has a maximum base of 5 m in diameter above the ground. In some situations the structures have stays. These would fall into the area with a maximum radius of 30 meters, but the stays themselves are hardly exposed at ground level, with only small steel rods protruding from the ground. Lattice towers have a bigger footprint as each has four legs that are a maximum of 15 m apart so that the final footprint would be approximately 15 m x 15 m. The height of either pylon structure will be up to 32 m.

The project will also include the switching station component of the authorised Paarde Valley PV2 on-site substation, with an approximate footprint area of 100 m x 100m, and a feeder bay at the Vetlaagte MTS with a capacity of 132 kV, as this needs to be handed over to Eskom with the grid connection self-build works once constructed.

In summary, the infrastructure associated with the proposed Grid Connection works for the Paarde Valley PV2 project (and to be handed back to Eskom following construction), includes the following:

- A 132kV, double circuit Overhead Power Line (OHPL) from the Switching Station connecting to the proposed Vetlaagte Main Transmission Substation (MTS)
- 132kV Feeder bay at the Vetlaagte MTS
- On-site Switching Station (SwS), adjacent to the authorised IPP 132 kV substation. (approximately 100 m x 100 m combined)

The technical details include:

- Overhead Powerline:
 - Height of pylons: Up to 32m

¹No. 113 of Government Gazette No. 41445 published 16 February 2018

- Type of poles/ pylons to be used: Double Circuit configuration. The alternatives under consideration include Steel lattice or Monopole structures in line with Eskom required specifications
- Transmission line capacity: 132kV
- OHPL Service Road (to lie within the OHPL servitude)
 - Length of OHPL service road(s) – Twin tracked service road following line route
 - Width of OHPL service road(s): 6 m
- Switching Station:
 - Footprint of approximately 50 m – 100 m x 100 m adjacent to IPP Substation
 - Area occupied by buildings (Control building, relay room, generator, storage warehouse, water tanks, ablutions): +-1.0 Hectares
 - Switching Station Access Road (separate access servitude from the nearest public road to the Switching Station yard)
 - Compacted gravel
 - Length of access road: +- 2.34 km
 - Width of access road: 8 m
 - Security fencing height: 2.4 m
 - Type of fencing: Eskom palisade fencing + chainlink fencing for temporary works
 - Capacity of on-site switching station: 132kv
- 132kV Feeder bay at the Vetlaagte MTS

The OHPL and Switching station are required to connect the authorised Paarde Valley PV2 Solar energy facility to the Eskom National Grid. The route selected follows boundary lines and / or existing OHPL routes so as to reduce the environmental impact and limit disruption to current farming activities as much as possible.

Holland & Associates Environmental Consultants has been appointed by the Applicant to undertake the requisite application for Environmental Authorisation for the proposed grid connection, in accordance with the National Environmental Management Act (NEMA) (No. 107 of 1998) EIA Regulations (2014), as amended. The application for environmental authorisation will require an impact assessment of the proposed development.

A Screening Tool Report has been generated for the proposed development, as contemplated in Regulation 16(1)(b)(v) of the Environmental Impact Assessment (EIA) Regulations, 2014, and is being submitted (refer to Annexure A) in accordance with Government Gazette 43561 (No. 960), dated 5 July 2019.

This Site Sensitivity Verification Report (including Screening Tool Report outcomes) has been compiled in compliance with Section 24(5)(a) and (h) and 44 of the National Environmental

Management Act, 1998, and in accordance with Government Gazette No. 43110 (GN 320) dated 20 March 2020, and:

- Confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool;
- Contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity; and
- Will be submitted together with the Application Form for Environmental Authorisation and Basic Assessment Report, prepared in accordance with the requirements of the 2014 EIA Regulations, as promulgated.

The specialist studies for the proposed development were commissioned and conducted in 2022, according to the identified specialist protocols in terms of Section 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation, in Government Gazette No. 43110 (GN 320) and Government Gazette No. 43855 (GN 1150).

2 Legislative Context

On 5 July 2019 the Minister of Forestry, Fisheries and the Environment gave notice in Government Gazette 43561 (No. 960) that the submission of a report generated from the national web-based screening tool, as contemplated in Regulation 16(1)(b)(v) of the Environmental Impact Assessment (EIA) Regulations, 2014, as amended, will be compulsory when submitting an application for Environmental Authorisation in terms of Regulation 19 and Regulation 21 of the EIA Regulations 2014, as amended, after 90 days from the publication of the notice (i.e. from 4 October 2019).

On 20 March 2020 and 30 October 2020, the Minister of Forestry, Fisheries and the Environment published procedures in Government Gazettes No. 43110 (GN 320) and No. 43855 (GN 1150) respectively, for the assessment and minimum criteria for reporting on identified environmental themes in terms of Section 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation. It prescribes that site sensitivity verification must be undertaken where a specialist assessment is required, but no specific assessment protocol has been prescribed, as follows:

“Prior to commencing with a specialist assessment, the current use of the land and the environmental sensitivity of the site under consideration identified by the national web-based screening tool (screening tool), must be confirmed by undertaking a site sensitivity verification.”

The site sensitivity verification must meet the following requirements:

- The site sensitivity verification must be undertaken by an Environmental Assessment Practitioner (EAP) or a specialist.
- The site sensitivity verification must be undertaken through the use of:
 - A desktop analysis, using satellite imagery;
 - A preliminary on-site inspection; and
 - Any other available and relevant information.
- The outcome of the site sensitivity verification must be recorded in the form of a report that:

- Confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;
- Contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity; and
- Is submitted together with the relevant assessment report prepared in accordance with the requirements of the EIA Regulations, as promulgated.

Where a specialist assessment is required and no specific environmental theme protocol has been gazetted, 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 (2014), as amended.

At the time of the initiation of the Pre-Application Basic Assessment Phase, the protocols for the specific environmental themes that had been gazetted included Agriculture, Avifauna (wind energy projects), Biodiversity (Terrestrial and Aquatic), Noise, Defence, and Civil Aviation in GN 320 of 20 March 2020 and Terrestrial Species (Plants and Animals) in GN 1150 of 30 October 2020.

3 Screening Tool Report Results

The national web-based Screening Tool was run for the proposed project on 13 June 2022 (Annexure A). The Screening Tool Report identified the following environmental sensitivities for the proposed development site (note that the Screening Tool assigns the highest mapped sensitivity within the development site to a particular theme, regardless of what proportion of the site is mapped at that sensitivity):

- Agriculture Theme: Medium Sensitivity
- Animal Species Theme: High Sensitivity
- Aquatic Biodiversity Theme: Very High Sensitivity
- Archaeological and Cultural Heritage Theme: Very High Sensitivity
- Civil Aviation Theme: High Sensitivity
- Defence Theme: Very High Sensitivity
- Palaeontology Theme: Very High Sensitivity
- Plant Species Theme: Medium Sensitivity
- Terrestrial Biodiversity Theme: Very High Sensitivity

It should be noted that the above potential sensitivities identified by the screening tool are indicative, and in the most part based on high level desk based data sources. Further detailed field assessment by specialists were conducted to confirm/deny these sensitivities. Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified in the Screening Tool Report for inclusion in the assessment report:

- Agricultural Impact Assessment
- Landscape/ Visual Impact Assessment
- Archaeological and Cultural Heritage Impact Assessment
- Palaeontology Impact Assessment
- Terrestrial Biodiversity Impact Assessment

- Aquatic Biodiversity Impact Assessment
- Avian Impact Assessment
- Civil Aviation Impact Assessment
- RFI Impact Assessment
- Geotechnical Assessment
- Plant Species Assessment
- Animal Species Assessment

4 Methodology for Site Sensitivity Verification

The following methodology was utilized by the Environmental Assessment Practitioner (EAP) for the purposes of verifying the *de facto* sensitivity of the site of the proposed project:

1. Analysis of available aerial imagery of the subject site, including historic imagery.
2. Analysis of available biodiversity, climate, geology, topography, soils, land-use and conservation mapping available on the EGIS website (<https://egis.environment.gov.za/>).
3. Undertaking of a site visit by the EAP to the project site on 19 and 20 April 2022. Refer to Annexure B for the Site Photographs taken by the EAP on 20 April 2022.
4. Site Sensitivity Verification was conducted by specialists for the following fields and included in their reporting (refer to Appendix C):
 - a. Animal species theme
 - b. Plant species theme
 - c. Terrestrial biodiversity theme
 - d. Aquatic biodiversity theme
 - e. Landscape / Visual theme
 - f. Archaeological and Cultural Heritage theme
 - g. Palaeontology theme
 - h. Agricultural theme
 - i. Avian theme and
 - j. RFI theme.

5 Results of Verification of Land Use & Sensitivity

The proposed gridline and associated infrastructure would traverse the following properties (farms and erven):

- Remainder of Portion 2 of Farm 145, Paarde Valley;
- Portion 6 of Farm 145, Paarde Valley;
- Portion 29 of Farm 145, Paarde Valley;
- Erven 266, 268, 5113, 5114, 5115, 5122, 5123, 5127, 5315 and 5316
- Remainder of Farm 179, Du Plessis Dam; and
- Remainder of Farm 4, Vetlaagte.

The proceeding section presents the list of specialist assessments that have been identified for inclusion in the Basic Assessment Report, based upon the outputs of the Screening Tool Report. The Screening Tool Report states that *“it is the responsibility of the EAP to confirm this list and to motivate in the assessment report the reason for not including any of the identified specialist study [sic] including the provision of photographic evidence of the site situation”*.

5.1 Agricultural theme

The Screening Tool Report indicated a 'Medium' sensitivity for the Agricultural Theme and recommended that an Agricultural Impact Assessment be undertaken. Agricultural specialist, Mr Johann Lanz was appointed to verify this designation, who confirmed that the level of agricultural assessment required is an Agricultural Compliance Statement as a result of the nature of the agricultural impact and the generally **low** potential agricultural environment (refer to Appendix C1). The site does include small, isolated patches of land classified as high agricultural sensitivity by the screening tool. However, due to the nature of the impact, these are irrelevant and do not change the required assessment i.e. a Compliance Statement. A site investigation is not considered necessary for this assessment. A desktop study was undertaken, using existing, fairly comprehensive climate and agricultural potential data available for the site.

The **predominantly low agricultural sensitivity**, as identified by the screening tool, was confirmed by the specialist. The motivation for confirming the sensitivity is that the climate data (low rainfall of approximately 285 mm per annum and high evaporation of approximately 1,500 mm per annum) proves the area to be arid, and therefore of limited land capability. A land capability of 5 and consequent low agricultural sensitivity is deemed appropriate for this land which is unsuitable for dryland crop production.

This site sensitivity verification verifies the entire site as being of less than high agricultural sensitivity and **predominantly of low agricultural sensitivity**. The required level of agricultural assessment is therefore confirmed as an Agricultural Compliance Statement.

5.2 Landscape / Visual Impact Assessment

The DFFE Screening Tool Report does not include a map of Relative Landscape Sensitivity for the proposed grid connection project. The Screening Tool Report did however recommend that a Visual / Landscape Impact Assessment be undertaken. Bernard Oberholzer and Quinton Lawson were appointed to undertake the site sensitivity verification (refer to Appendix C2) and visited the project site on 15 March 2022.

In terms of visual receptors, the proposed grid connection corridor could moderately affect the residential areas along the northern edge of De Aar while surrounding farmsteads to the east tend to be more than a kilometer away.

Visibility of lights at night would not be significant because of the localised need for lighting and the distance of receptors. Visibility of the proposed grid connection would be greatest where it crosses the R48, and less so from the northern part of De Aar, because of railway infrastructure in the foreground. To the east a number of existing Eskom powerlines already clutter the landscape. The viewshed, or zone of visual influence of the proposed grid connection potentially extends for some 4 to 5 km, but is restricted by low hills to the west, where the surrounding area is in a view shadow. The viewshed of the proposed switching station would be fairly localised.

Based on their findings and as recommended by the Screening Tool Report, a Visual Impact Assessment has been undertaken for the proposed project.

5.3 Archaeological and Cultural Heritage Impact Assessment

The Screening Tool Report assigned a 'Very High' sensitivity for the Archaeology and Cultural Heritage Theme, and thus recommended that an Archaeological and Cultural Heritage Impact

Assessment be undertaken. Consequently, heritage specialist, Mr Jayson Orton of ASHA Consulting (Pty) Ltd was appointed to undertake the site sensitivity verification (refer to Appendix C3).

The heritage specialist visited the site on 19 and 20 April 2022 and the site visit showed that in fact the entire study area is of **low sensitivity** with only heritage resources of **very low** cultural significance being found. A photographic record and description of the relevant heritage is contained within the impact assessment report.

Based on the specialist's findings and the recommendations of the Screening Tool Report, a Heritage Impact Assessment was still undertaken.

5.4 Palaeontology Impact Assessment

The Screening Tool Report assigned a 'Very High' sensitivity for the Palaeontology Theme, and recommended that a Palaeontological Impact Assessment be undertaken for the proposed project.

Palaeontological Specialist, Elize Butler of Banzai Environmental (Pty) Ltd was appointed to verify the site sensitivity. She visited the project site on 16 and 17 April 2022. According to the Site Sensitivity Verification Report compiled by the specialist (Appendix C4) the proposed development is underlain by sediments of Very High (red), High (orange) and Moderate (green) and Zero (grey) Palaeontological Sensitivity. The Environmental Screening Tool indicates that the Palaeontological Sensitivity of the proposed Paarde Valley PV2 Grid Connection to Vetlaagte MTS, near De Aar is Very High, High, Medium, and Low. This agrees with the SAHRIS Palaeosensitivity map.

Based on the Specialist's findings and the recommendations of the Screening Tool Report, a Palaeontology Impact Assessment was undertaken.

5.5 Terrestrial Biodiversity Impact Assessment

The Screening Tool Report assigned a 'Very High' sensitivity for the Terrestrial Biodiversity Theme, and recommended that a Terrestrial Biodiversity Impact Assessment be undertaken. David Hoare of David Hoare Consulting (Pty) Ltd was appointed to undertake the site sensitivity verification for this theme, and visited the proposed project site on 4 and 5 March 2022 (refer to Appendix C5).

The site inspection found that most of the study area occurs within Critical Biodiversity Area 2 or Ecological Support Area in the Northern Cape CBA map. Therefore, the site has very high potential sensitivity for this component of the Terrestrial Biodiversity Theme. A Terrestrial Biodiversity Specialist Assessment is therefore required.

Based on the specialist's findings, a terrestrial biodiversity specialist impact assessment was undertaken by David Hoare of David Hoare Consulting (Pty) Ltd in line with the substantive content requirements outlined within GN 320 of 20 March 2020, which outlines the protocol for the assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity in terms of the 2014 NEMA EIA Regulations, as amended.

5.5.1 Aquatic Biodiversity Impact Assessment

The Screening Tool Report assigned a 'Very High' sensitivity rating for the Aquatic Biodiversity Theme, and recommended that an Aquatic Biodiversity Impact Assessment be undertaken for the proposed project. Aquatic Ecology Specialist, Ms Toni Belcher was appointed to verify the assigned site sensitivity (refer to Appendix C6). The site sensitivity verification found the larger aquatic features on-site to be of **moderate** sensitivity and the smaller features to be of **low** sensitivity. The Very High Aquatic Biodiversity Combined Sensitivity mapping of the screening tool differs as it is linked to the Strategic Water Source Area (SWSA) for groundwater and with a larger Freshwater Ecosystem Priority Area (FEPA) River Sub-catchment for the Brak River. The proposed activities are, **however unlikely to impact the SWSA or the ecological integrity of the FEPA River.**

Considering the Specialist's findings, the Specialist undertook an impact assessment in line with the requirements of GN 320 of 20 March 2020, which outlines the protocol for the assessment and minimum report content requirements for environmental impacts on aquatic biodiversity in terms of the 2014 NEMA EIA Regulations, as amended.

5.6 Avian Impact Assessment

The Screening Tool Report recommended that an Avian Impact Assessment be undertaken based on the 'High' sensitivity rating assigned to *Neotis ludwigii* within the Animal Species Theme. Mr Chris van Rooyen of Chris van Rooyen Consulting (Pty) Ltd was appointed to verify this sensitivity. A site visit was undertaken on 28 March 2022 (Appendix C7).

Although the occurrence of the Species of Conservation Concern (SCC) could not be confirmed during the site visit to the study area, the authors have conducted several assessments and research projects in the broader area and have previously observed the SCC Ludwig's Bustard and Verreaux's Eagle in identical habitats in the broader area. Furthermore, other SCC's such as Martial Eagle *Polemaetus bellicosus* and Tawny Eagle *Aquila rapax* may occur in the area. Based on these observations, the classification of high sensitivity for avifauna in the screening tool is therefore confirmed.

Based on the Specialist's findings an avian impact assessment was undertaken in line with the substantive requirements of GN 1150 of 30 October 2020, which outlines the protocol for the assessment and minimum report content requirements for environmental impacts on terrestrial animal species in terms of the 2014 NEMA EIA Regulations, as amended.

5.7 Civil Aviation Assessment

The Screening Tool Report assigned a 'High Sensitivity' to the Civil Aviation Theme for the proposed project. Considering this, a Compliance Statement is required as per the *Protocol for the specialist assessment and minimum report content requirements for impacts on civil aviation installations* (GN 320 of 20 March 2020). Therefore, comment from the Civil Aviation Authority was obtained (Appendix C8) and a Civil Aviation Compliance Statement is included in the Basic Assessment Report. The South African Civil Aviation Authority (SA CAA) has conditionally approved the project, and has confirmed that they have no objection to the proposed Paarde Valley PV2 energy facility and associated infrastructure, including the 132 kV grid connection powerline to the Vetlaagte MTS.

5.8 RFI Assessment

The Screening Tool Report recommended that a Radio Frequency Interference (RFI) Assessment be undertaken. Callie Fouché of ITC Services (Pty) Ltd was appointed to undertake this assessment accordingly which is included in the Basic Assessment Report. The study found that Paarde Valley PV2 Switching Station as well as the Vetlaagte MTS Grid Connection pose a **very low to no RFI or EMI risk** to the surrounding equipment.

5.9 Geotechnical Assessment

The Screening Tool Report recommended that a Geotechnical Assessment be undertaken. No “sensitivity” was indicated in the Screening Tool Report for this theme. Should the Applicant’s Application for Environmental Authorisation be successful, the Applicant will undertake a detailed Geotechnical Assessment of the proposed project site prior to the commencement of the construction phase (to confirm, for example, substrate suitability for pylon foundations and to inform the siting of pylons) (refer to Appendix C9 for proof thereof). This is deemed appropriate by the EAP, accordingly a Geotechnical Assessment is not included in the Basic Assessment Report, but will be undertaken prior to construction as indicated above. It is the EAPs considered opinion that geotechnical input into the Basic Assessment process would not influence the outcome of the Basic Assessment process for the proposed project, given that a 200 m corridor has been assessed and is being applied for, to allow for micro-siting of the pylons during the detailed design and construction phase.

5.9.1 Plant Species Assessment

The Screening Tool Report assigned ‘Medium sensitivity’ to the Plant Species Theme for the proposed project and recommended that a Plant Species Assessment be undertaken. David Hoare of David Hoare Consulting (Pty) Ltd was appointed to undertake the site sensitivity verification for this theme, and visited the proposed project site on 4 and 5 March 2022.

The specialist found that there are **no plant species of concern that are likely to occur on site** and none were seen on site (refer to Appendix C5) and verified a low sensitivity for the Plant Species Theme with a Plant Species Compliance Statement being required.

Based on the Specialist’s findings, a compliance statement was therefore undertaken in line with the substantive content requirements outlined within GN 1150 of 30 October 2020, which outlines the protocol for the assessment and minimum report content requirements for environmental impacts on plant species in terms of the 2014 NEMA EIA Regulations, as amended.

5.10 Animal Species Assessment

The Screening Tool Report identified the site as ‘High sensitivity’ for the Animal Species Theme. This assignment by the screening tool is a result of the ‘High sensitivity’ identified for the bird species, *Neotis ludwigii*. No other animal group has a sensitivity rating for the proposed site. Since an avian impact assessment has been undertaken (and is discussed above in Section 5.1.7), no other animal species assessment is required.

However, David Hoare of David Hoare Consulting (Pty) Ltd was appointed to undertake a site sensitivity verification for this theme, and visited the proposed project site on 4 and 5 March 2022 (Appendix C5).

The specialist found that the site has no habitat that is suitable for any of the flagged animal species (excluding the taxon Aves) and none of these species are likely to occur there. This verifies the **low sensitivity** for the Animal Species Theme (excluding the taxon Aves).

Based on the Specialist's findings, a compliance statement was therefore undertaken in line with the substantive content requirements outlined within GN 1150 of 30 October 2020, which outlines the protocol for the assessment and minimum report content requirements for environmental impacts on animal species in terms of the 2014 NEMA EIA Regulations, as amended.

6 Conclusion

It has been verified that of the twelve (12) specialist studies identified in the National web-based Screening Tool, nine full specialist assessments namely: Agriculture, Landscape / Visual, Archaeological and Cultural Heritage, Palaeontology, Terrestrial Biodiversity, Aquatic Biodiversity, Avian Impact Assessments were required. Compliance statements were compiled for the Animal Species theme (excluding the taxon Aves), the Plant Species theme, the Civil Aviation Theme and a specialist study was conducted for the RFI theme. The abovementioned specialist studies and compliance statements are included in the Basic Assessment Report for the proposed project. A geotechnical study will be undertaken prior to construction, and will shortly be commissioned by the selected EPC since the project has obtained preferred bidder status.

The specialist impact assessments have been conducted in line with Appendix 6 of the NEMA EIA Regulations, 2014, as amended, or if applicable with the relevant assessment protocols outlined in GN 320 of 20 March 2020 and GN 1150 of 30 of October 2020.

ANNEXURE A: SCREENING TOOL REPORT

**SCREENING REPORT FOR AN ENVIRONMENTAL AUTHORIZATION AS
REQUIRED BY THE 2014 EIA REGULATIONS – PROPOSED SITE
ENVIRONMENTAL SENSITIVITY**

EIA Reference number: TBC

Project name: Paarde Valley PV2 to Vetlaagte MTS 132kV OHPL

Project title: Basic Assessment

Date screening report generated: 13/06/2022 10:22:35

Applicant: Paarde Valley PV2 (Pty) Ltd

Compiler: TW of H&A

Compiler signature:
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Application Category: Utilities Infrastructure | Electricity | Distribution and Transmission | Powerline

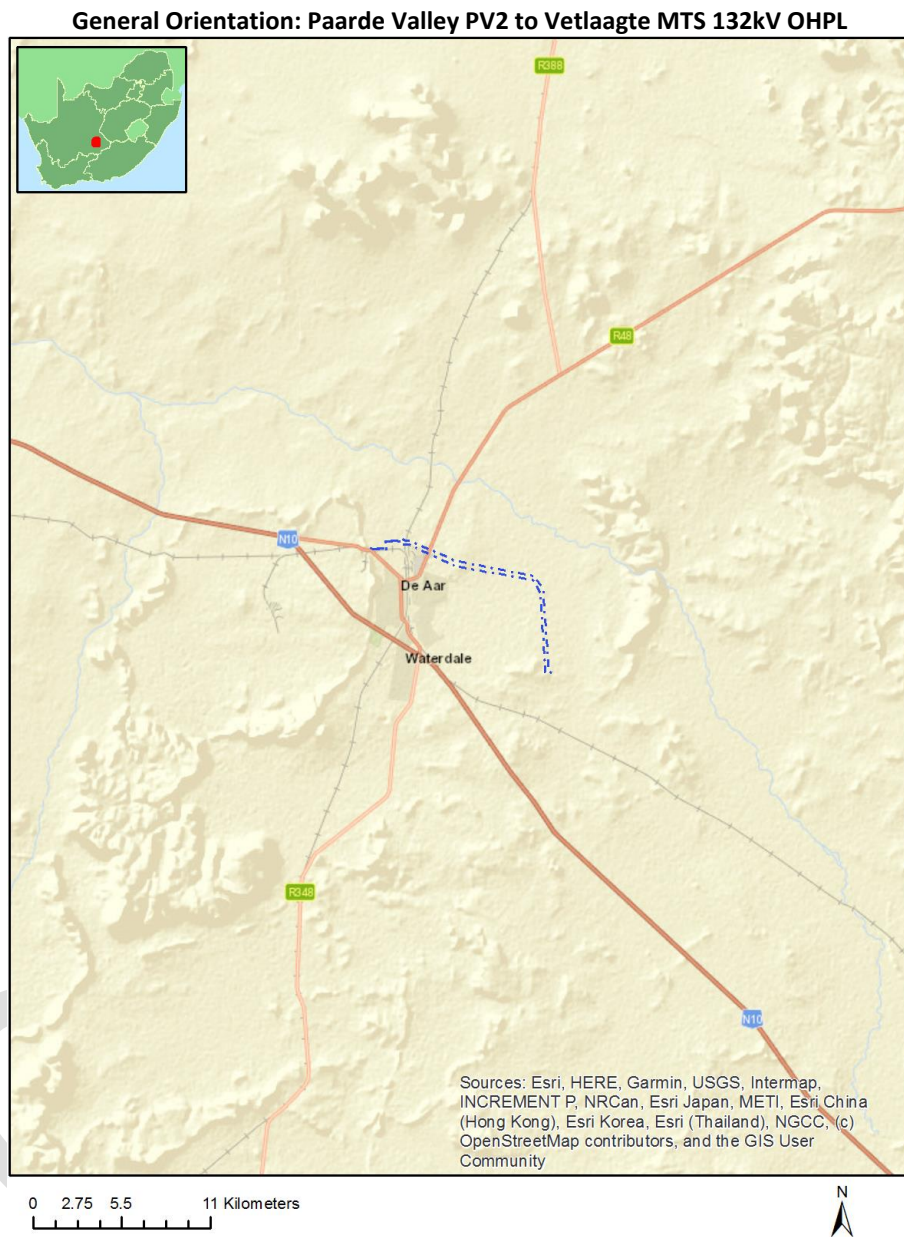
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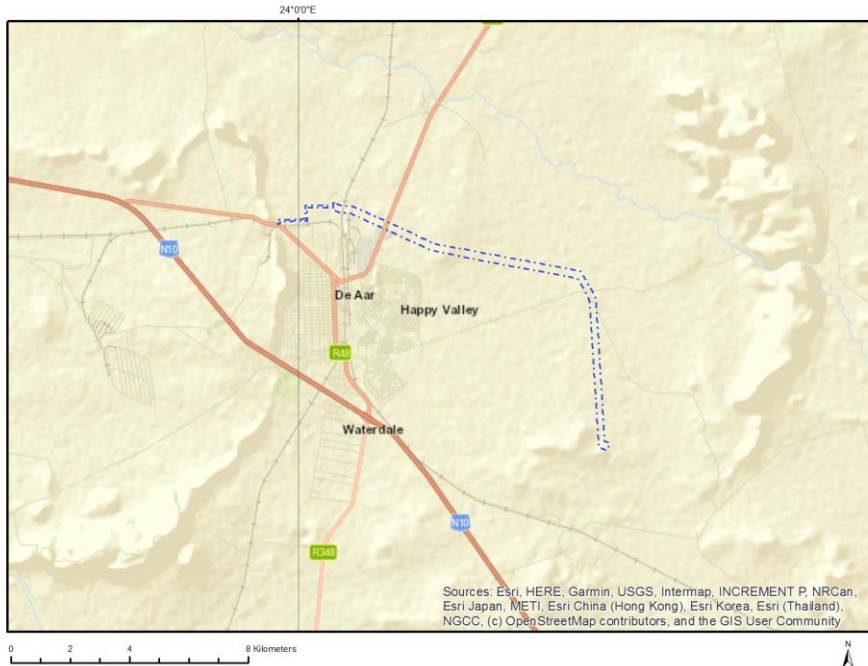
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Proposed Project Location

Orientation map 1: General location



Map of proposed site and relevant area(s)



Cadastral details of the proposed site

Property details:

No	Farm Name	Farm/ Erf No	Portion	Latitude	Longitude	Property Type
1	DE AAR	266	0	30°37'55.28S	24°0'45.59E	Erven
2	DE AAR	268	0	30°38'9.86S	24°0'56.72E	Erven
3	DE AAR	5113	0	30°37'28.1S	24°1'9.99E	Erven
4	DE AAR	5123	0	30°37'50.46S	24°1'10.42E	Erven
5	DE AAR	5315	0	30°37'52.45S	24°1'16.92E	Erven
6	DE AAR	5121	0	30°37'48.17S	24°1'20.5E	Erven
7	DE AAR	5316	0	30°37'28.3S	24°1'17.17E	Erven
8	DE AAR	5122	0	30°37'50.7S	24°1'14.97E	Erven
9	DE AAR	5115	0	30°37'27.67S	24°1'19.57E	Erven
10	DE AAR	5114	0	30°37'28.63S	24°1'14.58E	Erven
11	VETLAAGTE	4	0	30°40'33.21S	24°5'44.13E	Farm
12	PAARDE VALLEY	145	0	30°34'20.62S	24°3'25.91E	Farm
13	DU PLESSIS DAM	179	0	30°37'54.18S	24°3'10.83E	Farm
14	DE AAR	180	0	30°41'6.73S	24°3'37.54E	Farm
15	PAARDE VALLEY	145	2	30°36'37.16S	24°0'30.49E	Farm Portion
16	PAARDE VALLEY	145	29	30°36'50.79S	24°1'42.26E	Farm Portion
17	PAARDE VALLEY	145	6	30°32'45.56S	24°2'10.85E	Farm Portion
18	DE AAR	180	10	30°38'52.22S	24°3'5.57E	Farm Portion
19	PAARDE VALLEY	145	43	30°37'51.44S	24°1'43.7E	Farm Portion
20	VETLAAGTE	4	0	30°40'25.97S	24°5'43.86E	Farm Portion
21	DU PLESSIS DAM	179	0	30°37'54.6S	24°3'15.84E	Farm Portion
22	PAARDE VALLEY	145	30	30°37'55.44S	24°1'25.84E	Farm Portion
23	PAARDE VALLEY	145	31	30°37'45.45S	24°1'30.22E	Farm Portion

Development footprint¹ vertices:
No development footprint(s) specified.

Wind and Solar developments with an approved Environmental Authorisation or applications under consideration within 30 km of the proposed area

No	EIA Reference No	Classification	Status of application	Distance from proposed area (km)
1	12/12/20/2250/1	Solar PV	Approved	1.2
2	12/12/20/2500/AM3	Solar PV	Approved	0
3	12/12/20/2025/2	Solar PV	Approved	0
4	12/12/20/2025/1	Solar CSP	Approved	0
5	12/12/20/2048/1	Solar PV	Approved	2.7
6	14/12/16/3/3/2/382/2	Solar PV	Approved	0
7	12/12/20/2025	Solar CSP	Approved	0
8	12/12/20/2250/5	Solar PV	Approved	7.3
9	12/12/20/1673	Solar PV	Approved	0
10	12/12/20/2048/2	Solar PV	Approved	2.7
11	14/12/16/3/3/2/382/7	Solar PV	Approved	0
12	12/12/20/2250/3	Solar PV	Approved	5.8
13	12/12/20/2250/4	Solar PV	Approved	4.6
14	14/12/16/3/3/2/382/5/AM3	Solar PV	Approved	0
15	12/12/20/2250/2	Solar PV	Approved	1.2
16	14/12/16/3/3/2/382/1	Solar PV	Approved	0
17	14/12/16/3/3/2/403	Solar PV	Approved	16.2
18	12/12/20/2500	Solar PV	Approved	0
19	14/12/16/3/3/2/382/5	Solar PV	Approved	0
20	12/12/20/2177	Solar PV	Approved	0.5
21	12/12/20/2025/2/A	Solar PV	Approved	0
22	12/12/20/2250	Solar PV	Approved	1.2
23	12/12/20/2048/4	Solar PV	Approved	2.7
24	12/12/20/2048/3	Solar PV	Approved	2.7
25	14/12/16/3/3/2/403	Solar PV	Approved	16.2
26	14/12/16/3/3/2/382/6	Solar PV	Approved	0
27	14/12/16/3/3/2/382/3	Solar PV	Approved	0
28	12/12/20/2498/AM3	Solar PV	Approved	0
29	14/12/16/3/3/2/382/4	Solar PV	Approved	0

Environmental Management Frameworks relevant to the application

No intersections with EMF areas found.

Environmental screening results and assessment outcomes

The following sections contain a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development site as well as the most environmental

¹ “development footprint”, means the area within the site on which the development will take place and includes all ancillary developments for example roads, power lines, boundary walls, paving etc. which require vegetation clearance or which will be disturbed and for which the application has been submitted.

sensitive features on the site based on the site sensitivity screening results for the application classification that was selected. The application classification selected for this report is: **Utilities Infrastructure | Electricity | Distribution and Transmission | Powerline.**

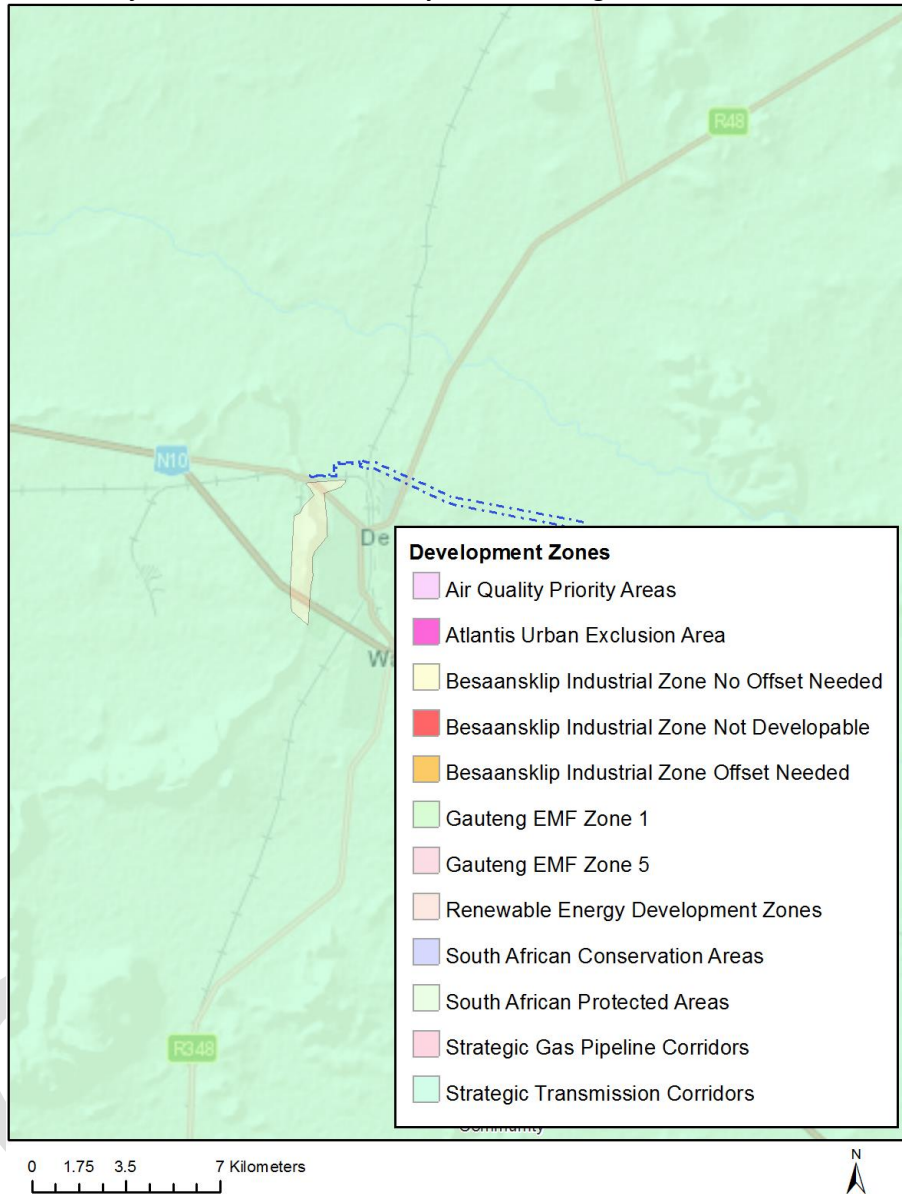
Relevant development incentives, restrictions, exclusions or prohibitions

The following development incentives, restrictions, exclusions or prohibitions and their implications that apply to this site are indicated below.

Incentive , restriction or prohibition	Implication
Strategic Transmission Corridor- Central corridor	https://screening.environment.gov.za/ScreeningDownloads/DevelopmentZones/Combined_EGI.pdf

Map indicating proposed development footprint within applicable development incentive, restriction, exclusion or prohibition zones

Project Location: Paarde Valley PV2 to Vetlaagte MTS 132kV OHPL



Proposed Development Area Environmental Sensitivity

The following summary of the development site environmental sensitivities is identified. Only the highest environmental sensitivity is indicated. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only and must be verified on site by a suitably qualified person before the specialist assessments identified below can be confirmed.

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme			X	
Animal Species Theme		X		

Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme	X			
Civil Aviation Theme		X		
Defence Theme	X			
Paleontology Theme	X			
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

Specialist assessments identified

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report. It is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the site situation.

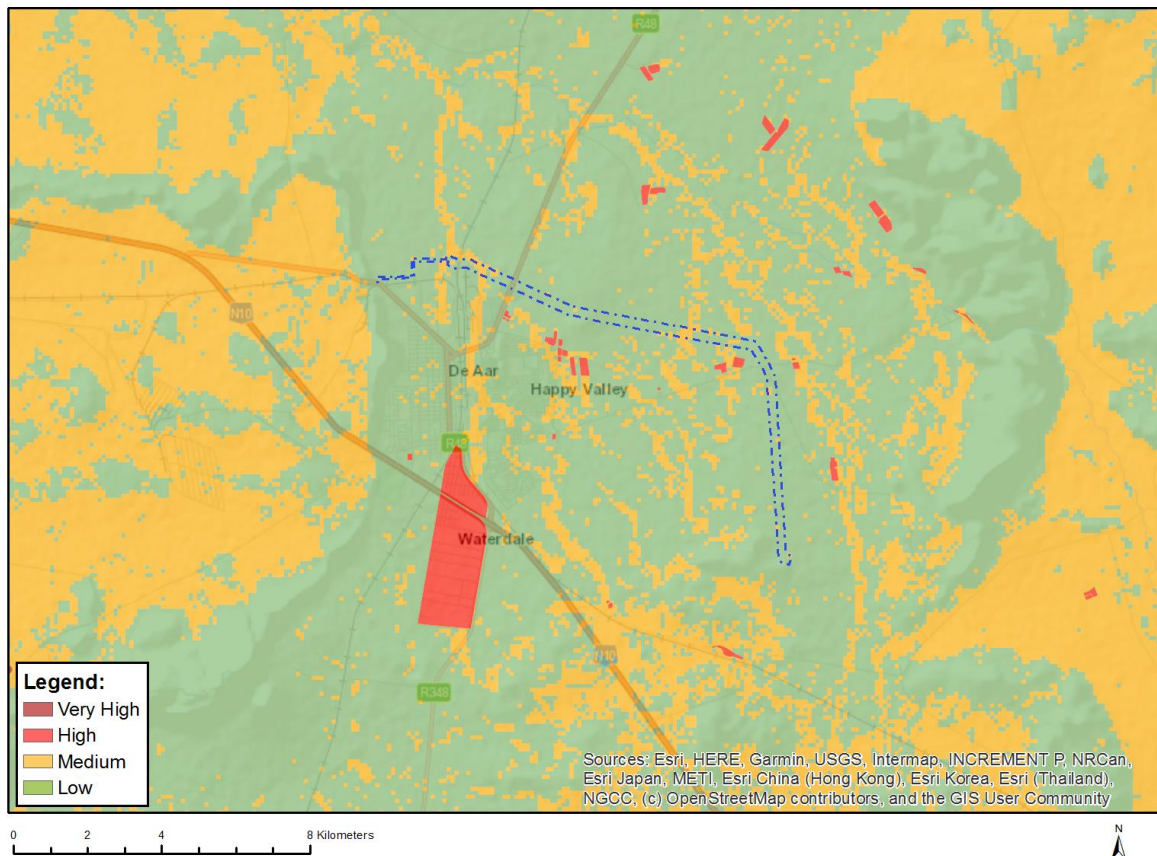
N o	Specialist assessment	Assessment Protocol
1	Agricultural Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Agriculture_Assessment_Protocols.pdf
2	Landscape/Visual Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
3	Archaeological and Cultural Heritage Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
4	Palaeontology Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
5	Terrestrial Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Terrestrial_Biodiversity_Assessment_Protocols.pdf
6	Aquatic Biodiversity Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Aquatic_Biodiversity_Assessment_Protocols.pdf

7	Avian Impact Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Avifauna_Assessment_Protocols.pdf
8	Civil Aviation Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Civil_Aviation_Installations_Assessment_Protocols.pdf
9	RFI Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
10	Geotechnical Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf
11	Plant Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Plant_Species_Assessment_Protocols.pdf
12	Animal Species Assessment	https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Animal_Species_Assessment_Protocols.pdf

Results of the environmental sensitivity of the proposed area.

The following section represents the results of the screening for environmental sensitivity of the proposed site for relevant environmental themes associated with the project classification. It is the duty of the EAP to ensure that the environmental themes provided by the screening tool are comprehensive and complete for the project. Refer to the disclaimer.

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY

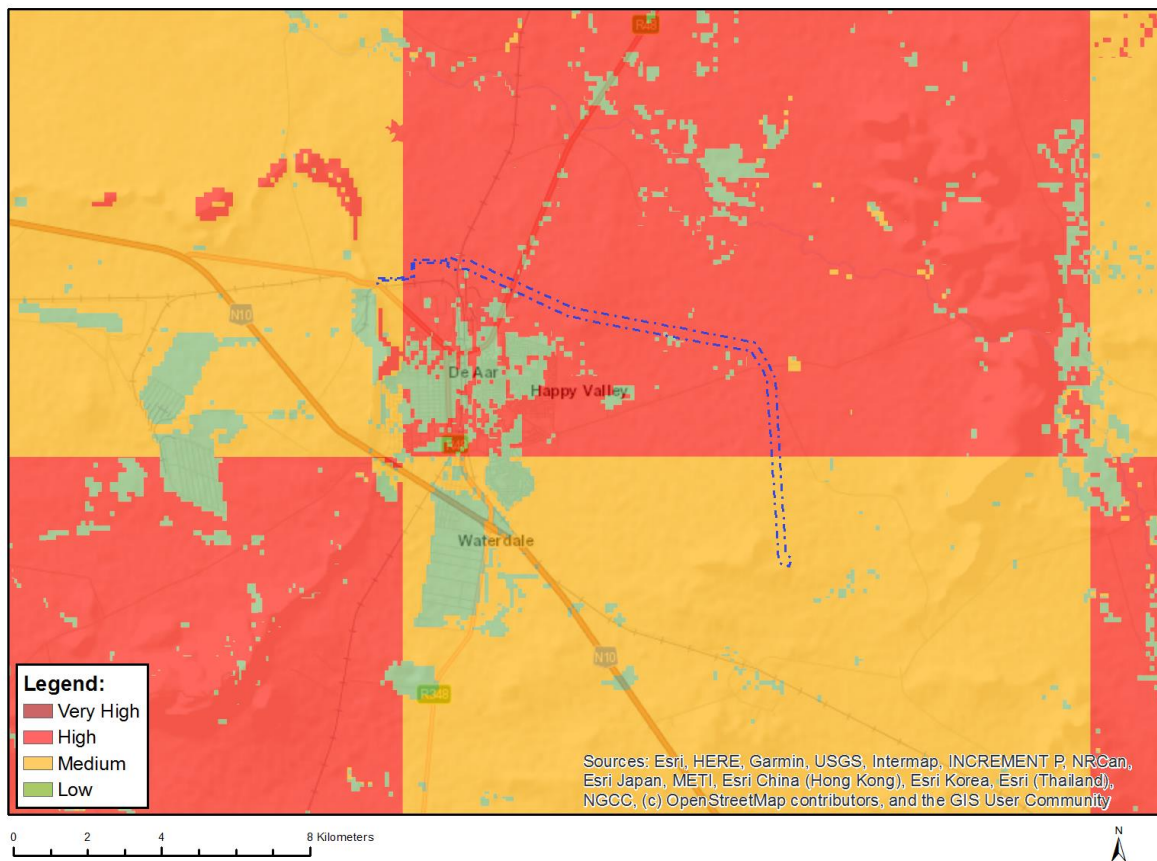


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low
Medium	Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



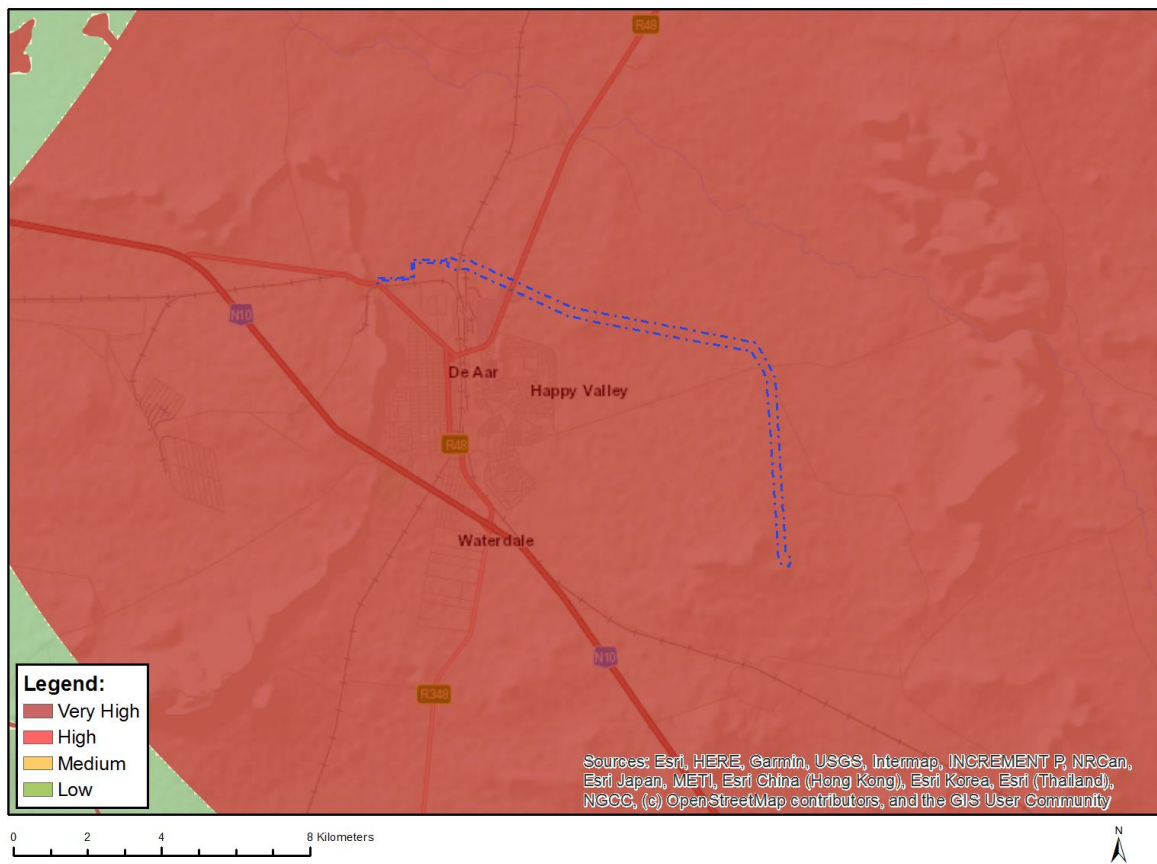
Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Neotis ludwigii
High	Aves-Falco biarmicus
High	Aves-Aquila rapax
Low	Subject to confirmation
Medium	Aves-Aquila rapax
Medium	Aves-Neotis ludwigii

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY

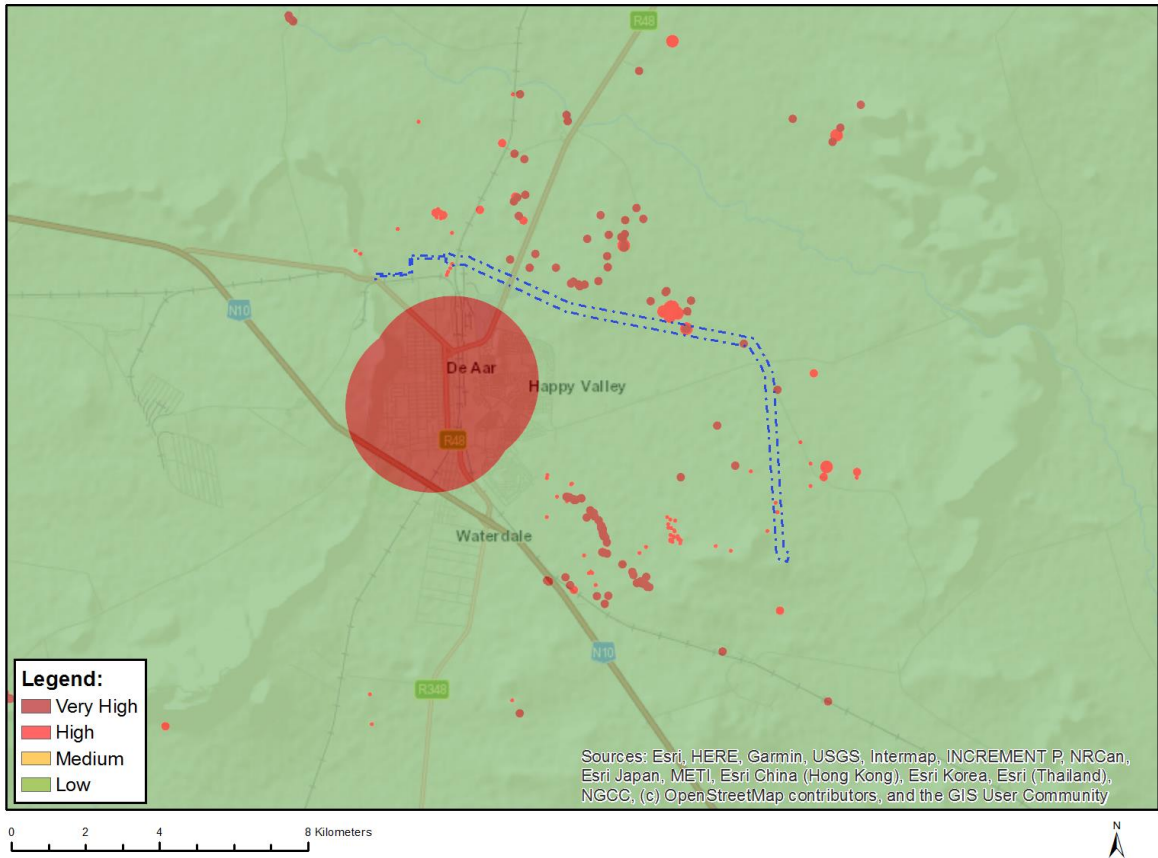


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Very High	Strategic water source area
Very High	Freshwater ecosystem priority area quinary catchments

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY

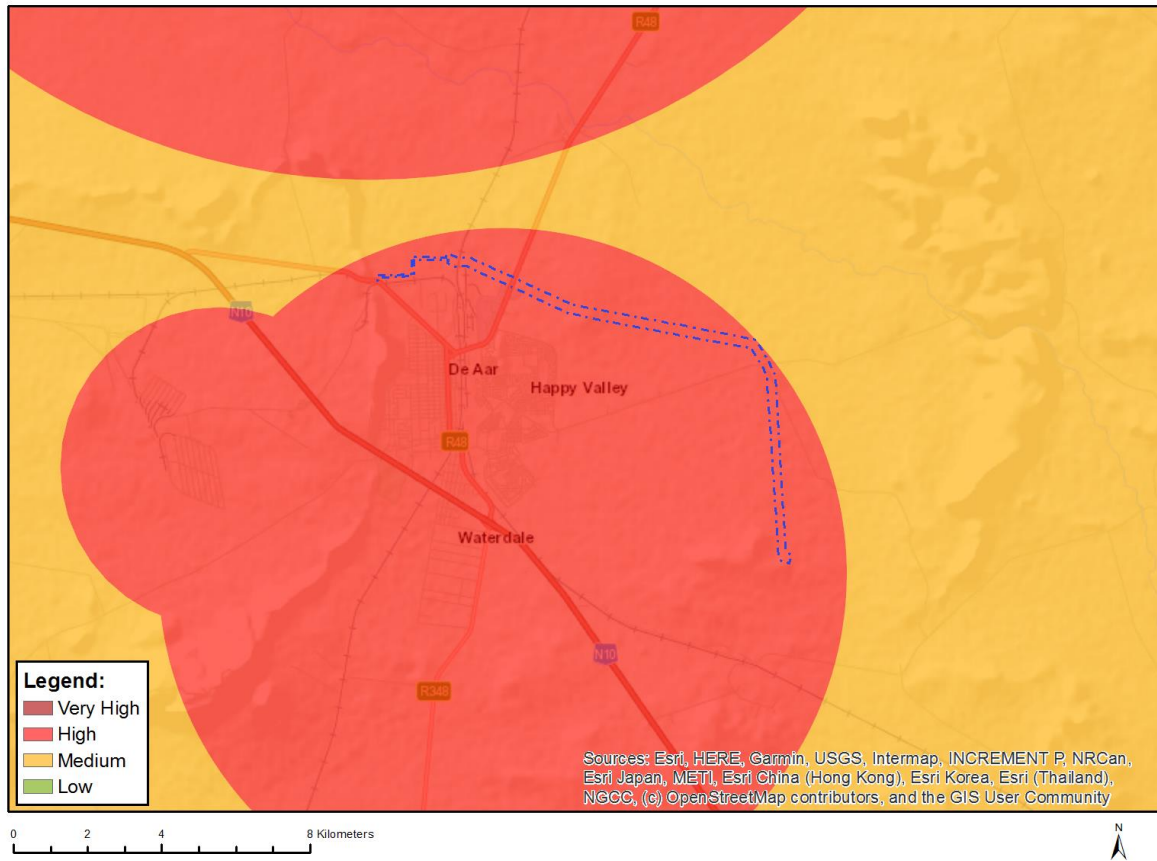


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
High	Within 150m of a Grade IIIa Heritage site
High	Within 50m of a Grade IIIc Heritage site
Low	Low sensitivity
Very High	Within 100m of an Ungraded Heritage site

MAP OF RELATIVE CIVIL AVIATION THEME SENSITIVITY

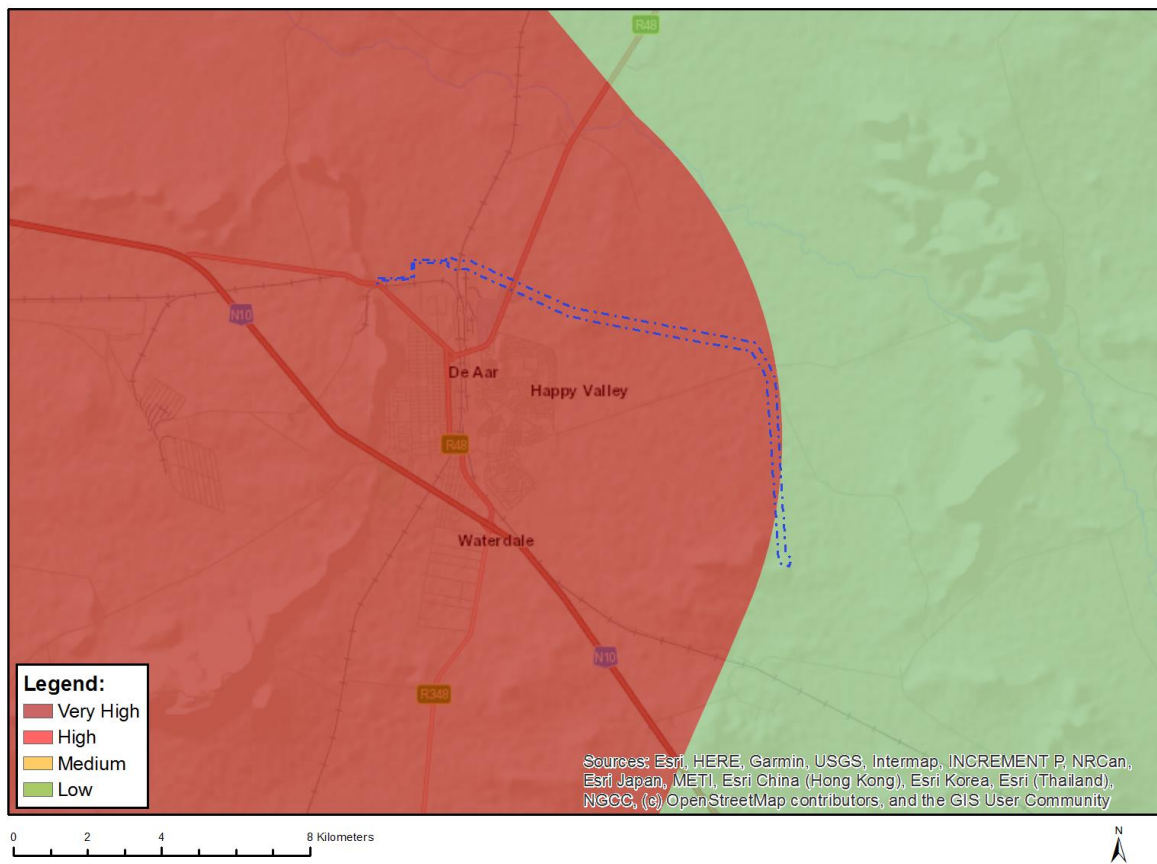


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Within 8 km of other civil aviation aerodrome
Medium	Within 5 km of an air traffic control or navigation site
Medium	Between 15 and 35 km from a civil aviation radar

MAP OF RELATIVE DEFENCE THEME SENSITIVITY

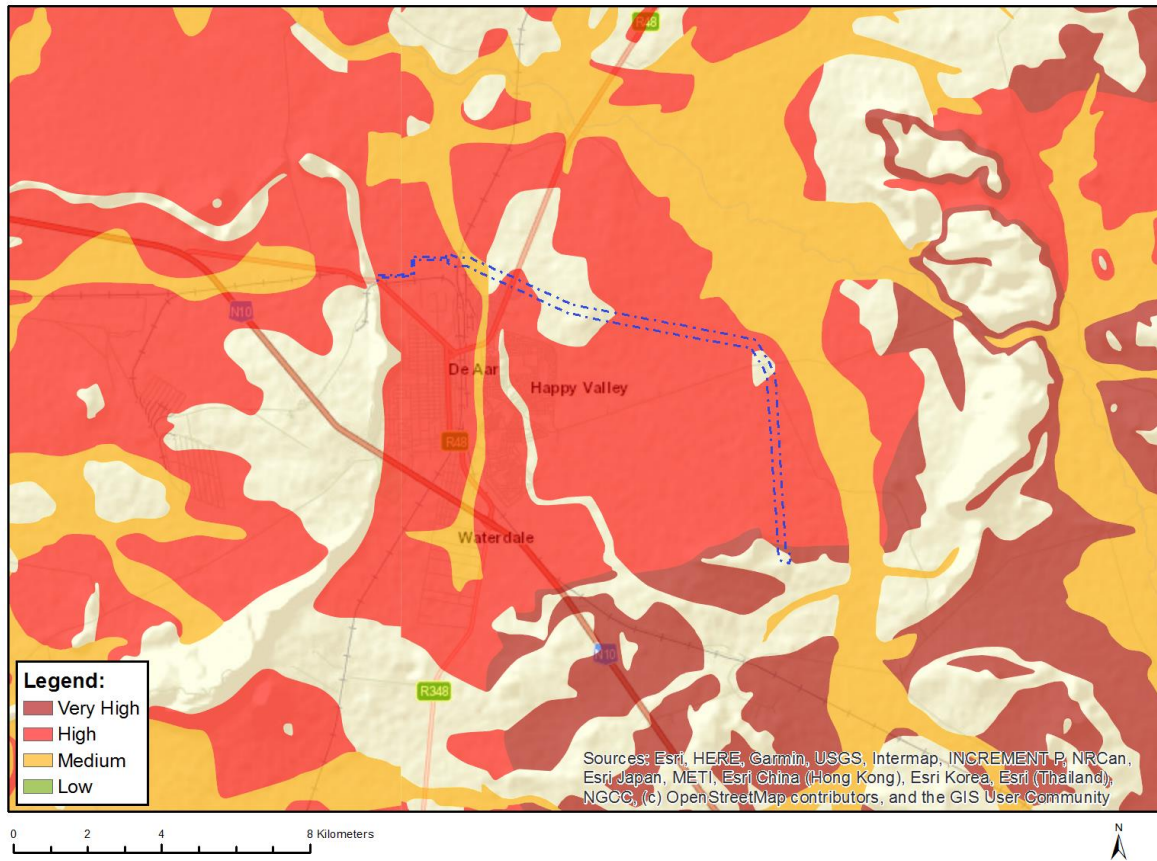


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Medium	Military and Defence Site
Very High	Military and Defence Site

MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY

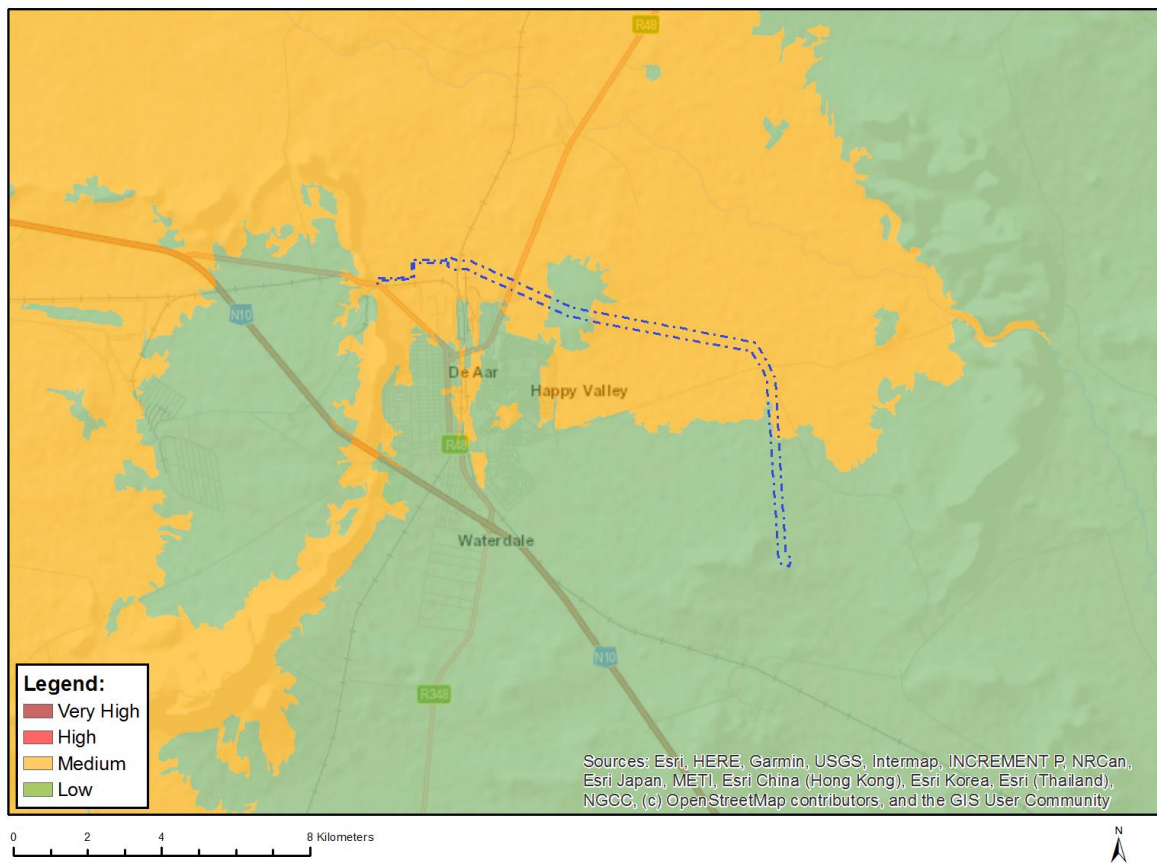


Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
High	Features with a High paleontological sensitivity
Medium	Features with a Medium paleontological sensitivity
Very High	Features with a Very High paleontological sensitivity

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



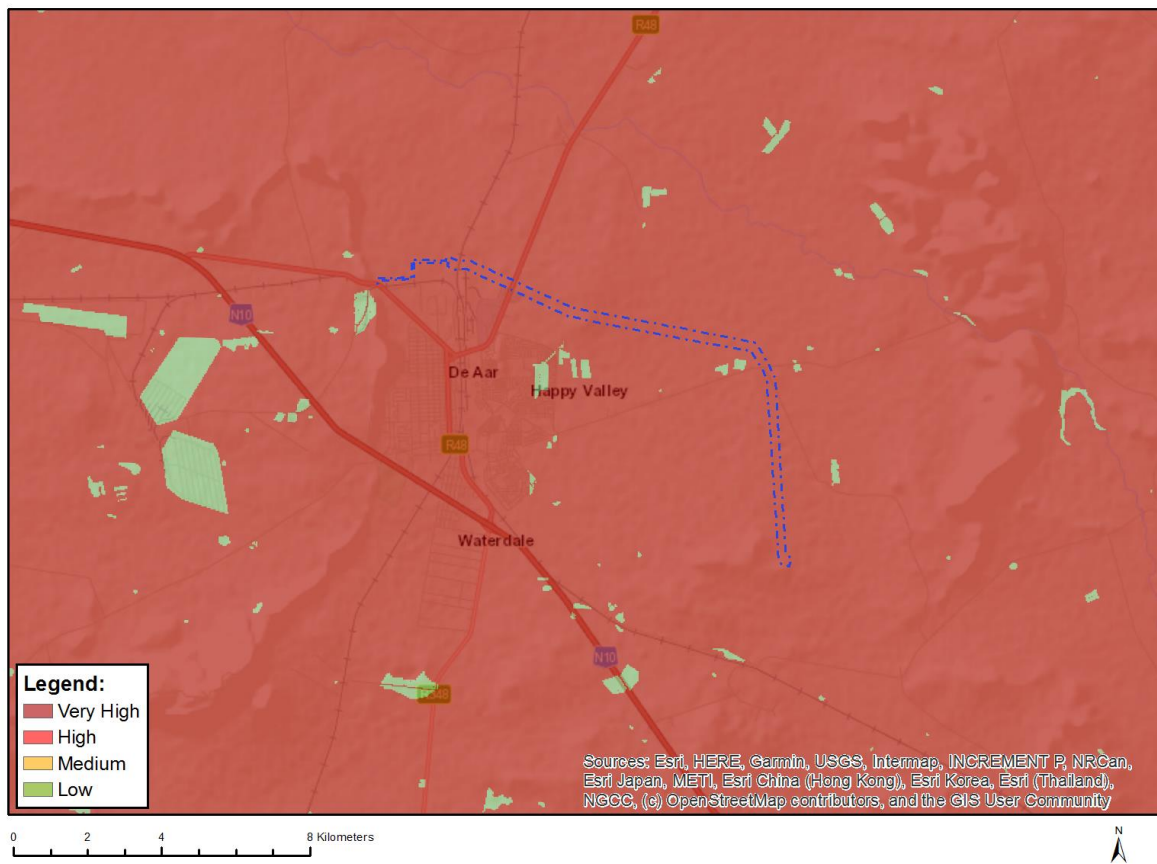
Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Medium	Hereroa concava
Medium	Tridentea virescens

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Very High	Critical biodiversity area 2
Very High	Ecological support area
Very High	FEPA Subcatchments

ANNEXURE B: SITE PHOTOGRAPHS

Proposed Paarde Valley PV2 Switching Station, 132kv Overhead Powerline to Vetlaagte Main Transmission Substation (MTS), and associated infrastructure, near De Aar

Photo Sheets – Site photographs taken on 20 April 2022.







	
<p>Photo 1: View of the proposed location of the switching station from a southerly direction, on the authorised Paarde Valley PV2 site.</p>	<p>Photo 2: View of the proposed location of the switching station from a westerly direction.</p>
	
<p>Photo 3: View of the proposed location for the start of the gridline connection from the authorised PV facility on Portion 2 of Farm 145, Paarde Valley, from a westerly direction.</p>	<p>Photo 4: View from within the proposed gridline corridor up the railway line in a northerly direction. The proposed gridline connection would cross the railway line in a west to east direction (parallel to the powerlines shown in this image).</p>
	
<p>Photo 5: View from within the corridor of the proposed gridline connection where it would traverse a watercourse on Portion 29 of Farm 145, Paarde Valley. This view is in a south-easterly direction, looking along the proposed gridline connection route.</p>	<p>Photo 6: View of the proposed gridline connection from the R43, in a westerly direction, towards the authorised (but not constructed) Paarde Valley PV2 solar energy facility.</p>



Photo 7: View of the proposed gridline connection from the R43, in an easterly direction. The operational solar facility lies to the north of the proposed route (on the lefthand side of this photograph)



Photo 8: View of the proposed gridline connection route. The proposed route would run parallel to the gridlines in this photograph. This view is in a north-easterly direction.



Photo 9: View of the proposed gridline connection route on Farm RE/179 Du Plessis Dam, in a south-easterly direction.



Photo 10: View of the proposed gridline connection route on Farm RE/179 Du Plessis Dam, in a north-westerly direction, looking back at the operational De Aar solar facility



Photo 11: View of the proposed gridline connection route on Farm RE/179 Du Plessis Dam, in an easterly direction.



Photo 12: View of the proposed gridline connection route, looking north, from the northern section of Remainder of Farm 4, Vetlaagte. The powerline to the far left of the photograph is the Bushbuck/Hydra 2 132 kV .



Photo 13: View of the proposed gridline connection route. The proposed line would run in the same corridor of the gridline seen in the foreground of the photograph. This view is in a south-westerly direction.



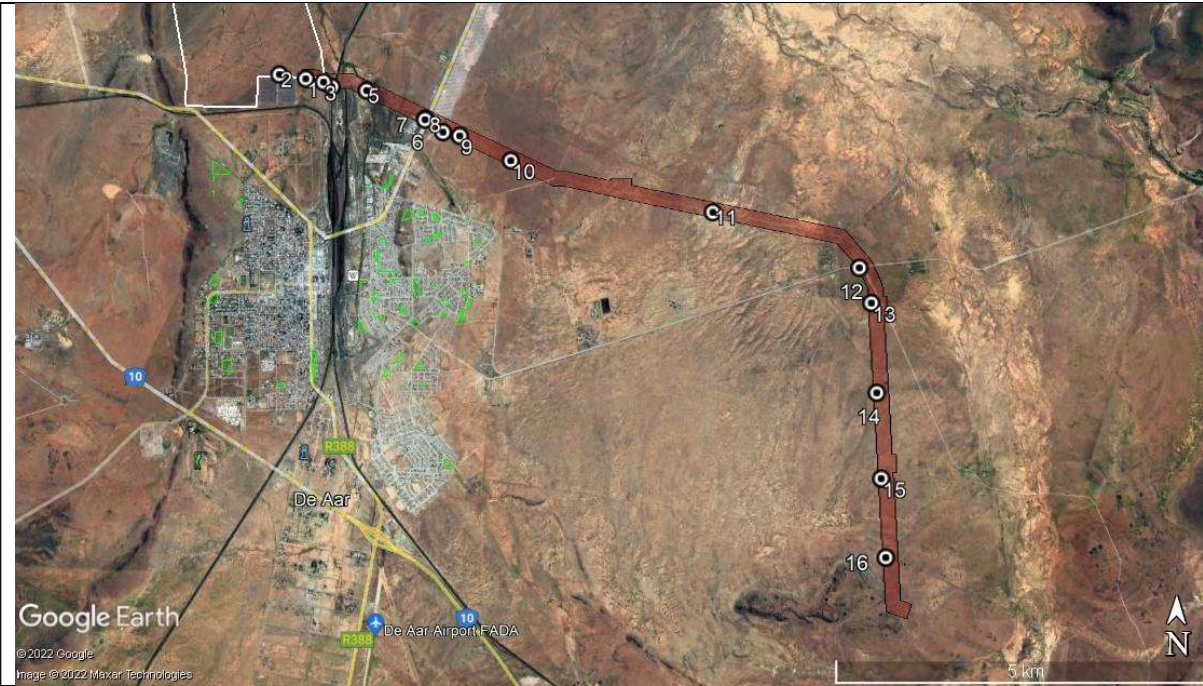
Photo 14: View of the proposed gridline connection route looking southwards. The proposed route would run within the same corridor as the gridline seen in the foreground of the photograph.



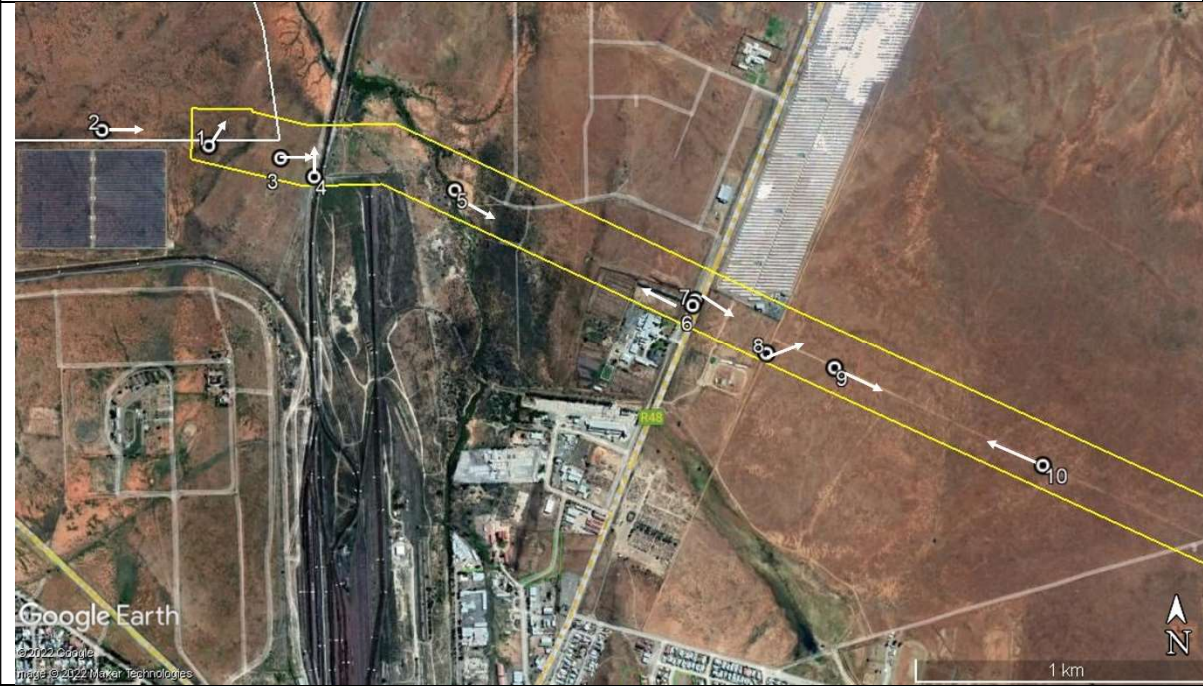
Photo 15: View of the proposed gridline connection route looking northwards. The proposed route would run within the same corridor as the gridline seen in the foreground of the photograph.



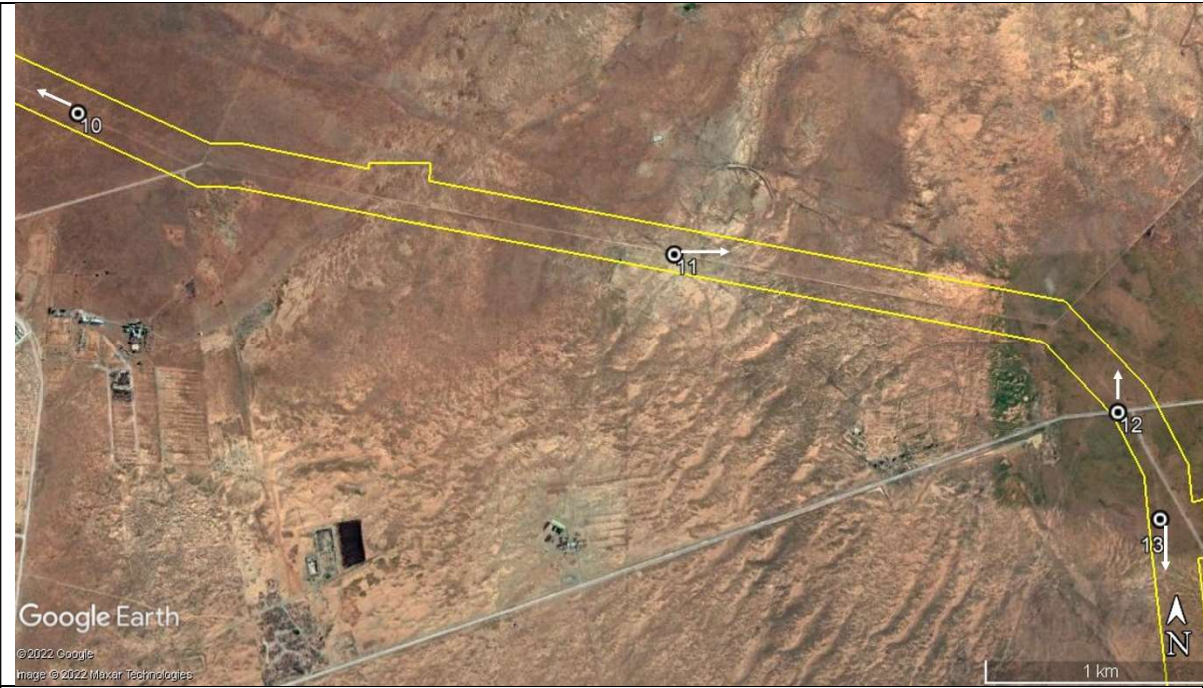
Photo 16: View of the proposed gridline connection route, looking southwards, towards the location of the planned Vetlaagte MTS Substation which would be located close to the edge of the lefthand side of the photograph.



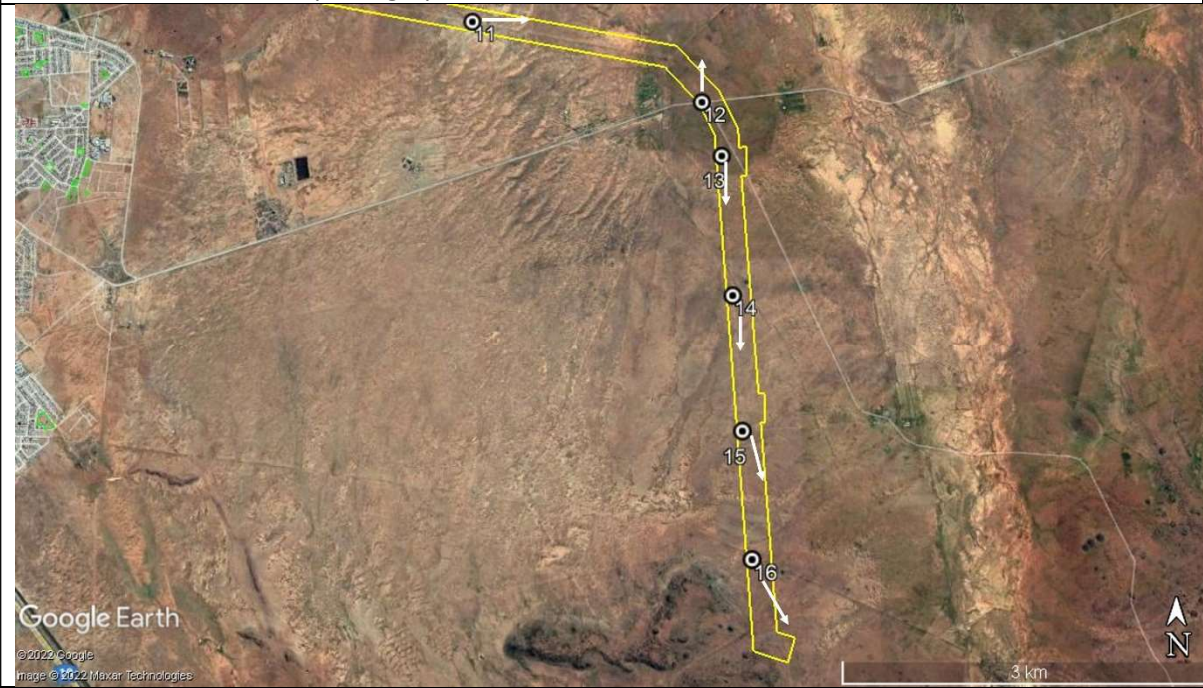
Position of photographs (1 – 16) described above, along the proposed gridline connection route from the authorised Paarde Valley PV2 site to Vetlaagte Substation.



Position and direction of photographs 1 – 10.



Position and direction of photographs 10 – 13.



Position and direction of photographs 11 – 16.

ANNEXURE C: Specialist Site Sensitivity Verification Reporting

Appendix C1: Agricultural Specialist

Appendix C2: Visual Specialist

Appendix C3: Archaeological and Cultural Heritage Specialist

Appendix C4: Palaeontology Specialist

Appendix C5: Ecology Specialist (Terrestrial Biodiversity, Animal Species and Plant Species)

Appendix C6: Aquatic Biodiversity Specialist

Appendix C7: Avian Specialist

Appendix C8: Comment from the Civil Aviation Authority

Appendix C9: Proof of Geotechnical Study (to be conducted)

Appendix C1: Agricultural Specialist

Johann Lanz
Soil Scientist (Pr.Sci.Nat.)
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**SITE SENSITIVITY VERIFICATION
AND
AGRICULTURAL COMPLIANCE STATEMENT
FOR
PROPOSED GRID CONNECTION FROM PAARDE VALLEY PV2
TO VETLAAGTE MAIN TRANSMISSION SUBSTATION
NEAR DE AAR, NORTHERN CAPE PROVINCE**

**Report by
Johann Lanz**

27 June 2022

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EXECUTIVE SUMMARY

The key findings of this study are:

- The loss of future agricultural production potential resulting from the proposed development is totally insignificant in the context of the agricultural environment. This is because only a very small amount of land will be excluded from agricultural production and that land has very limited production potential, anyway.
- The conclusion of this assessment is that the proposed development will have insignificant agricultural impact and will therefore be acceptable in terms of its impact on the agricultural production capability of the site.
- The only sources of impact are the loss of approximately 3 hectares of grazing land from the footprint of the switching station and its access road and minimal disturbance to the land (erosion and topsoil loss) during construction and decommissioning. Land disturbance can be completely and fairly easily mitigated through generic mitigation measures.
- From an agricultural impact point of view, it is recommended that the development be approved.

1 INTRODUCTION

Environmental authorisation is being sought for the proposed construction and operation of the grid connection from Paarde Valley PV2 to the proposed Vetlaagte main transmission substation (currently being applied for under a separate environmental authorization application process) near De Aar, Northern Cape Province (see location in Figure 1). In terms of the National Environmental Management Act (Act No 107 of 1998) (NEMA), an application for environmental authorisation requires an agricultural assessment, in this case an Agricultural Compliance Statement.

Johann Lanz was appointed as an independent agricultural specialist to conduct the agricultural assessment. The objective and focus of an agricultural assessment is to assess whether or not the proposed development will have an unacceptable agricultural impact, and based on this, to make a recommendation on whether or not it should be approved.

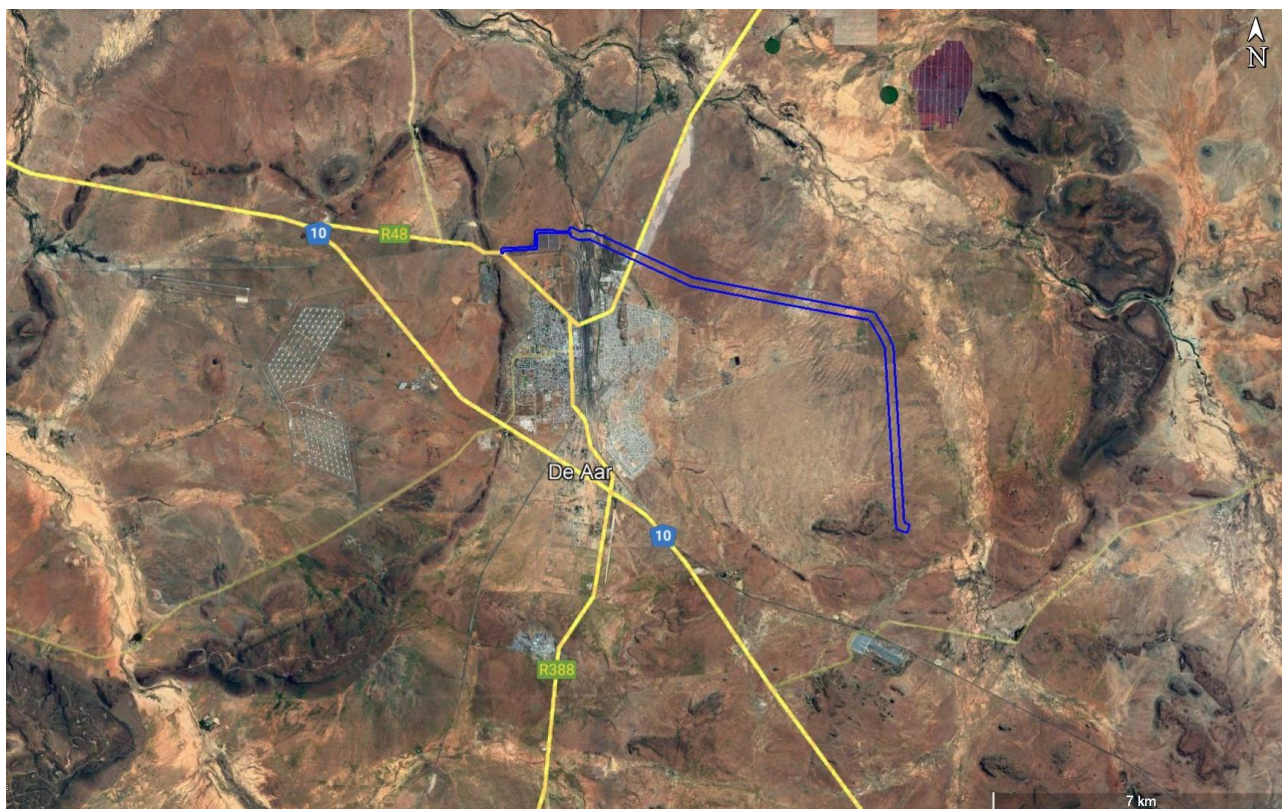


Figure 1. Locality map of the proposed assessment footprint outside De Aar.

The purpose of including an agricultural component in Environmental Authorisation is to ensure that South Africa balances the need for development against the need to ensure the conservation of the natural agricultural resources, including land, required for agricultural production and national food security. The aim of the agricultural protocol of NEMA (*Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural*

resources gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA, 1998) is primarily to preserve the agricultural production potential of scarce arable land by ensuring that development does not exclude agricultural production from such land or impact it to the extent that the crop production potential is reduced.

However, this proposed development poses zero threat to arable land and almost no threat to grazing land (see impact assessment section).

2 PROJECT DESCRIPTION

The proposed project consists of a 132kV overhead power line of approximately 13 km and an on-site switching station with its approximately 2.34 km access road adjacent to the IPP collector substation (at the authorised Paarde Valley solar PV2 facility) with an approximate footprint area of 100m x 100m.

Because of the insignificant agricultural impact of electrical grid infrastructure, it is not necessary to consider the detail of the design and layout of the development in this assessment. It would have insignificant agricultural impact, regardless of its design and layout.

3 TERMS OF REFERENCE

The terms of reference for this study is to fulfill the requirements of the *Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources* gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA, 1998).

The verified agricultural sensitivity of the preferred switching station alternative is less than high (see Site Sensitivity Verification, Section 7). The level of agricultural assessment required in terms of the protocol for sites of less than high sensitivity is an Agricultural Compliance Statement. The power lines are linear activities and therefore also require only an Agricultural Compliance Statement, regardless of the sensitivity of the corridor.

The terms of reference for an Agricultural Compliance Statement, as stipulated in the protocol, are listed below, and the section number of this report which fulfils each stipulation is given after it in brackets.

1. The Agricultural Compliance Statement must be prepared by a soil scientist or agricultural specialist registered with the South African Council for Natural Scientific Professions (SACNASP) (**Appendix 1**).

2. The compliance statement must:
 1. be applicable to the preferred site and proposed development footprint;
 2. confirm that the site is of “low” or “medium” sensitivity for agriculture (**Section 7**); and
 3. indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site (**Section 9.6**).
3. The Agricultural Compliance Statement must contain, as a minimum, the following information:
 1. details and relevant experience as well as the SACNASP registration number of the soil scientist or agricultural specialist preparing the statement including a curriculum vitae (**Appendix 1**);
 2. a signed statement of independence by the specialist (**Appendix 2**);
 3. a map showing the proposed development footprint (including supporting infrastructure) with a 50 m buffered development envelope, overlaid on the agricultural sensitivity map generated by the screening tool (**Figure 2**);
 4. confirmation from the specialist that all reasonable measures have been taken through micro-siting to avoid or minimize fragmentation and disturbance of agricultural activities (**Section 9.4**);
 5. a substantiated statement from the soil scientist or agricultural specialist on the acceptability, or not, of the proposed development and a recommendation on the approval, or not of the proposed development (**Section 9.6**);
 6. any conditions to which this statement is subjected (**Section 11**);
 7. in the case of a linear activity, confirmation from the agricultural specialist or soil scientist, that in their opinion, based on the mitigation and remedial measures proposed, the land can be returned to the current state within two years of completion of the construction phase (**Section 9.5**);
 8. where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr (**Section 10**); and
 9. a description of the assumptions made and any uncertainties or gaps in knowledge or data (**Section 5**).

4 METHODOLOGY OF STUDY

4.1 Methodology for assessing the agro-ecosystem

This report adheres to the process and content requirements of the gazetted agricultural protocol as outlined in Section 3 above. As per the requirement, the assessment was based on a desktop analysis of existing soil and agricultural potential data for the site.

The following sources of information were used:

- Soil data was sourced from the land type data set, of the Department of Agriculture, Forestry and Fisheries (DAFF). This data set originates from the land type survey that was conducted from the 1970's until 2002. It is the most reliable and comprehensive national database of soil information in South Africa and although the data was collected some time ago, it is still entirely relevant as the soil characteristics included in the land type data do not change within time scales of hundreds of years.
- Land capability data was sourced from the 2017 National land capability evaluation raster data layer produced by the DAFF, Pretoria.
- Field crop boundaries were sourced from Crop Estimates Consortium, 2019. *Field Crop Boundary data layer, 2019*. Pretoria. Department of Agriculture, Forestry and Fisheries.
- Rainfall and evaporation data was sourced from the SA Atlas of Climatology and Agrohydrology (2009, R.E. Schulze) available on Cape Farm Mapper.
- Grazing capacity data was sourced from the 2018 DAFF long-term grazing capacity map for South Africa, available on Cape Farm Mapper.
- Satellite imagery of the site and surrounds was sourced from Google Earth.

5 ASSUMPTIONS, UNCERTAINTIES OR GAPS IN KNOWLEDGE OR DATA

There are no specific assumptions, uncertainties or gaps in knowledge or data that affect the findings of this study.

6 APPLICABLE LEGISLATION AND PERMIT REQUIREMENTS

Power lines require the registration of a servitude for each farm portion crossed. In terms of the Subdivision of Agricultural Land Act (Act 70 of 1970) (SALA), the registration of a power line servitude requires written consent of the Minister unless either of the following two conditions apply:

1. if the servitude width does not exceed 15 metres; and
2. if Eskom is the applicant for the servitude.

If one or both of these conditions apply, then no agricultural consent is required. The second condition is likely to apply, even if another entity gets Environmental Authorisation for and constructs the power line, but then hands it over to Eskom for its operation. Eskom is currently exempt from agricultural consent for power line servitudes.

Rehabilitation after disturbance to agricultural land is managed by the Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA). A consent in terms of CARA is required for the cultivation of

virgin land. Cultivation is defined in CARA as “any act by means of which the topsoil is disturbed mechanically”. The purpose of this consent for the cultivation of virgin land is to ensure that only land that is suitable as arable land is cultivated. Therefore, despite the above definition of cultivation, disturbance to the topsoil that results from the construction of a renewable energy facility and its associated infrastructure does not constitute cultivation as it is understood in CARA. This has been corroborated by Anneliza Collett (Acting Scientific Manager: Natural Resources Inventories and Assessments in the Directorate: Land and Soil Management of the Department of Agriculture, Land Reform and Rural Development (DALRRD)). The construction and operation of the facility will therefore not require consent from the Department of Agriculture, Land Reform and Rural Development in terms of this provision of CARA.

7 SITE SENSITIVITY VERIFICATION

In terms of the gazetted agricultural protocol, a site sensitivity verification must be submitted that:

1. confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;
2. contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity.

The purpose of including an agricultural component in Environmental Authorisation is to ensure that South Africa balances the need for development against the need to ensure the conservation of the natural agricultural resources, including land, required for agricultural production and national food security.

Agricultural sensitivity, as used in the national web-based environmental screening tool, is a direct function of the capability of the land for agricultural production. The general assessment of agricultural sensitivity that is employed in the national web-based environmental screening tool, identifies all arable land that can support viable crop production, as high (or very high) sensitivity. This is because there is a scarcity of arable production land in South Africa and its conservation for agricultural use is therefore a priority. Land which cannot support viable crop production is much less of a priority to conserve for agricultural use, and is rated as medium or low agricultural sensitivity.

It is important to recognise that the agricultural sensitivity of land, in terms of a particular development, is not only a function of the screening tool sensitivity, but is also a function of the severity of the impact which that development poses to agriculture. This is not recognised in the screening tool classification of sensitivity. So, for example, the sensitivity of an agricultural

environment to overhead power lines is not what the screening tool classifies the sensitivity as, because most agricultural environments have a very low sensitivity to overhead power lines because these have negligible agricultural impact, regardless of the agricultural production potential of the land that they cross (see Section 9). Therefore, in the context of the development of overhead power lines, almost no land can be considered to have high sensitivity for impacts on agricultural resources.

For this reason the screening tool sensitivity of the power line corridor is irrelevant and only the sensitivity of the switching station and its access road influences the significance of the agricultural impact.

The screening tool classifies agricultural sensitivity according to only two independent criteria – the land capability rating and whether the land is used for cropland or not. All cropland is classified as at least high sensitivity, based on the logic that if it is under crop production, it is indeed suitable for it, irrespective of its land capability rating.

The screening tool sensitivity categories in terms of land capability are based upon the Department of Agriculture's updated and refined, country-wide land capability mapping, released in 2016. The data is generated by GIS modelling. Land capability is defined as the combination of soil, climate and terrain suitability factors for supporting rain fed agricultural production. It is an indication of what level and type of agricultural production can sustainably be achieved on any land, based on its soil, climate and terrain. The higher land capability values (≥ 8 to 15) are likely to be suitable as arable land for crop production, while lower values are only likely to be suitable as non-arable grazing land.

A map of the proposed assessment footprint, overlaid on the screening tool sensitivity, is given in Figure 2. As noted above, the screening tool sensitivity of the power line corridors is irrelevant to agricultural impact. Because none of the land is classified as cropland, agricultural sensitivity is purely a function of land capability. The land capability of the switching station and its access road site and power line corridor on the screening tool is predominantly 5, which translates to a low agricultural sensitivity.

The predominantly low agricultural sensitivity, as identified by the screening tool (27 June 2022), is confirmed by this assessment. The motivation for confirming the sensitivity is that the climate data (low rainfall of approximately 285 mm per annum and high evaporation of approximately 1,500 mm per annum) proves the area to be arid, and therefore of limited land capability. A land capability of 5 and consequent low agricultural sensitivity is entirely appropriate for this land which is totally unsuitable for dryland crop production.

This site sensitivity verification verifies the entire site as being of less than high agricultural sensitivity and predominantly of low agricultural sensitivity. The required level of agricultural assessment is therefore confirmed as an Agricultural Compliance Statement.

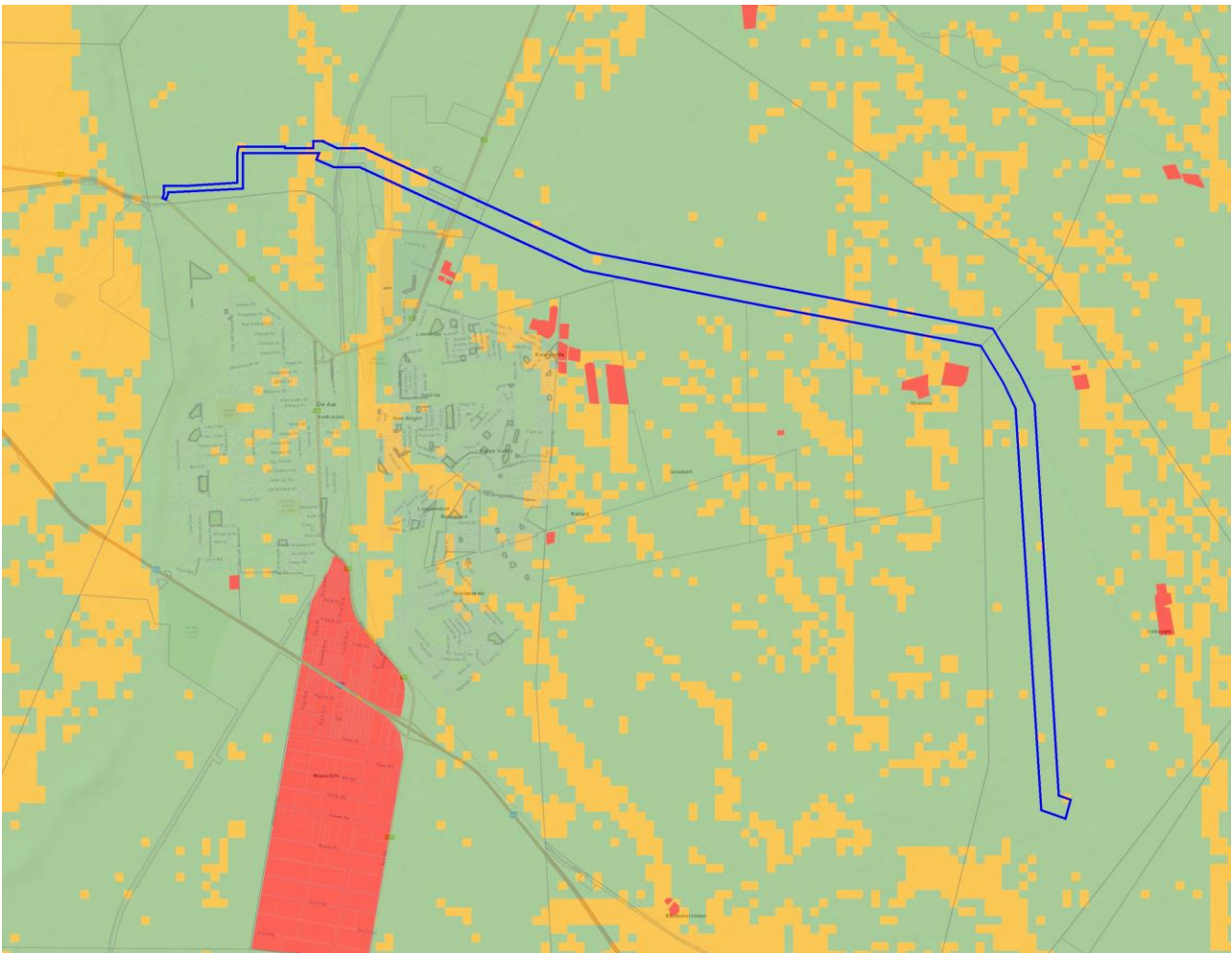


Figure 2. The proposed assessment footprint (dark blue outline) overlaid on agricultural sensitivity, as given by the screening tool (green = low; yellow = medium; red = high).

8 BASELINE DESCRIPTION OF THE AGRO-ECOSYSTEM

The agricultural production potential of the site is completely constrained by the aridity of the climate (low rainfall of approximately 285 mm per annum and high evaporation of approximately 1,500 mm per annum). As a result, the agricultural land use is limited to grazing. Grazing of both sheep and game is the dominant agricultural land use in the area. Grazing capacity of the site is fairly low at 20 hectares per large stock unit. There is no cultivation in the corridor. In the surrounding area the little cultivation that there is, is confined to small, isolated patches of pasture or fodder crops around farmsteads.

9 ASSESSMENT OF AGRICULTURAL IMPACT

9.1 General

An agricultural impact is a temporary or permanent change to the future production potential of land. The significance of the agricultural impact is directly proportional to the extent of the change in production potential. If a development will not change the future production potential of the land, then there is no agricultural impact.

The proposed electrical grid infrastructure has insignificant agricultural impact for three reasons:

- There is no loss of future agricultural production potential under transmission lines because all agricultural activities that are viable in this environment, can continue completely unhindered underneath transmission lines.
- The direct, permanent, physical footprint of the development that has any potential to interfere with agriculture (approximately 3 hectare footprint of the switching station and its access road), is insignificantly small within an agricultural environment of large farms with low density grazing. The track beneath the power line will have an insignificant effect on the grazing potential underneath the line.
- The affected land has very limited agricultural production potential, anyway.

The only sources of impact are the loss of approximately 3 hectares of grazing land and minimal disturbance to the land (erosion and topsoil loss) during construction and decommissioning. Land disturbance can be completely and fairly easily mitigated through generic mitigation measures.

9.2 Cumulative impact

The cumulative impact of a development is the impact that development will have when its impact is added to the incremental impacts of other past, present or reasonably foreseeable future activities that will affect the same environment. It is important to note that the cumulative impact assessment for a particular project, like what is being done here, is not the same as an assessment of the impact of all surrounding projects. The cumulative assessment for this project is an assessment only of the impacts associated with this project, but seen in the context of all surrounding impacts. It is concerned with this project's contribution to the overall impact, within the context of the overall impact. But it is not simply the overall impact itself.

The most important concept related to a cumulative impact is that of an acceptable level of change to an environment. A cumulative impact only becomes relevant when the impact of the proposed development will lead directly to the sum of impacts of all developments causing an acceptable

level of change to be exceeded in the surrounding area. If the impact of the development being assessed does not cause that level to be exceeded, then the cumulative impact associated with that development is not significant.

The potential cumulative agricultural impact of importance is a regional loss of future agricultural production potential. The defining question for assessing the cumulative agricultural impact is this:

What level of loss of future agricultural production potential is acceptable in the area, and will the loss associated with the proposed development, when considered in the context of all past, present or reasonably foreseeable future impacts, cause that level in the area to be exceeded?

There are a number of renewable energy developments that are leading to loss of agricultural grazing land in the area. However, because this development itself leads to insignificant agricultural land loss, its cumulative impact must also logically be insignificant. It therefore does not make sense to conduct a more formal assessment of the development's cumulative impacts as per DFFE requirements for cumulative impacts. Many times more electricity grid infrastructure than currently exists, or is currently proposed, can be accommodated before acceptable levels of change in terms of loss of production potential are exceeded. In reality the landscape in this environment could be covered with power lines and agricultural production potential would not be affected.

Due to the considerations discussed above, the cumulative impact of loss of future agricultural production potential can confidently be assessed as not having an unacceptable negative impact on the area. In terms of cumulative impact, the proposed development is therefore acceptable and it is therefore recommended that it be approved.

9.3 Impacts of the no-go alternative

The no-go alternative considers impacts that will occur to the agricultural environment in the absence of the proposed development. There is no agricultural impact of the no-go option. Therefore, the extent to which the development (insignificant impact) and the no-go alternative will impact agricultural production are more or less equal, which results in there being, from an agricultural impact perspective only, no preferred alternative between the development and the no-go. However, the no-go option would prevent the proposed development from contributing to the environmental, social and economic benefits associated with the development of renewable energy in South Africa.

9.4 Micro-siting to minimize fragmentation and disturbance of agricultural activities

The agricultural protocol requires confirmation that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities. However, the agricultural uniformity and low agricultural potential of the environment, means that the exact positions of all infrastructure will make no material difference to agricultural impacts and disturbance.

9.5 Confirmation of linear activity impact

The protocol provision of a linear impact confirmation only makes sense when the requirement for an Agricultural Compliance Statement is based on the fact that the development is a linear activity. In this case the verified low agricultural sensitivity determines that an Agricultural Compliance Statement suffices, even for non-linear activities.

9.6 Impact assessment and statement

An Agricultural Compliance Statement is not required to formally rate agricultural impacts. It is only required to indicate whether or not the proposed development will have an unacceptable impact on the agricultural production capability of the site. It must provide a substantiated statement on the acceptability, or not, of the proposed development and a recommendation on the approval, or not of the proposed development.

Nevertheless, it is hereby confirmed that the agricultural impact of the proposed development is insignificant.

The conclusion of this assessment is that the proposed development will have an insignificant and therefore acceptable impact on the future agricultural production potential of the site. This is because:

- There is no loss of future agricultural production potential under transmission lines because all agricultural activities that are viable in this environment, can continue completely unhindered underneath transmission lines.
- The direct, permanent, physical footprint of the development that has any potential to interfere with agriculture (approximately 3 hectare footprint of the switching station and its access road), is insignificantly small within an agricultural environment of large farms with low density grazing.
- The affected land has very limited agricultural production potential, anyway.

Therefore, from an agricultural impact point of view, it is recommended that the development be approved.

10 ENVIRONMENTAL MANAGEMENT PROGRAMME INPUTS

There are no additional mitigation measures required, over and above what has already been included in the Generic EMPr for overhead electricity transmission and distribution infrastructure as per Government Notice 435, which was published in Government Gazette 42323 on 22 March 2019.

11 CONCLUSIONS

The conclusion of this assessment is that the proposed development will have insignificant agricultural impact and will therefore be acceptable in terms of its impact on the agricultural production capability of the site. This is substantiated by the facts that the loss of agricultural production potential resulting from the development is insignificant because of the small amount of land excluded from agricultural production and because of the land's very limited production potential.

The only sources of impact are the loss of the 3 hectares of grazing land from the footprint of the substation and its access road and minimal disturbance to the land (erosion and topsoil loss) during construction and decommissioning. Land disturbance can be completely and fairly easily mitigated through generic mitigation measures included in the Generic EMPr for overhead electricity transmission and distribution infrastructure.

From an agricultural impact point of view, it is recommended that the development be approved.

The conclusion of this assessment on the acceptability of the proposed development and the recommendation for its approval is not subject to any conditions.

12 REFERENCES

Cape Farm Mapper. Available at: <https://gis.elsenburg.com/apps/cfm/>

Crop Estimates Consortium, 2019. *Field Crop Boundary data layer, 2019*. Pretoria. Department of Agriculture, Forestry and Fisheries.

Department of Agriculture, Forestry and Fisheries, 2017. National land capability evaluation raster data layer, 2017. Pretoria.

Schulze, R.E. 2009. SA Atlas of Climatology and Agrohydrology, available on Cape Farm Mapper.
Available at: <https://gis.elsenburg.com/apps/cfm/>

APPENDIX 1: SPECIALIST CURRICULUM VITAE

Johann Lanz Curriculum Vitae

Education

M.Sc. (Environmental Geochemistry)	University of Cape Town	1996 - 1997
B.Sc. Agriculture (Soil Science, Chemistry)	University of Stellenbosch	1992 - 1995
BA (English, Environmental & Geographical Science)	University of Cape Town	1989 - 1991
Matric Exemption	Wynberg Boy's High School	1983

Professional work experience

I have been registered as a Professional Natural Scientist (Pri.Sci.Nat.) in the field of soil science since 2012 (registration number 400268/12) and am a member of the Soil Science Society of South Africa.

Soil & Agricultural Consulting Self employed 2002 - present

Within the past 5 years of running my soil and agricultural consulting business, I have completed more than 170 agricultural assessments (EIAs, SEAs, EMPRs) in all 9 provinces for renewable energy, mining, electrical grid infrastructure, urban, and agricultural developments. I was the appointed agricultural specialist for the nation-wide SEAs for wind and solar PV developments, electrical grid infrastructure, and gas pipelines. My regular clients include: Zutari; CSIR; SiVEST; SLR; WSP; Arcus; SRK; Environamics; Royal Haskoning DHV; ABO; Enertrag; WKN-Windcurrent; JG Afrika; Mainstream; Redcap; G7; Mulilo; and Tiptrans. Recent agricultural clients for soil resource evaluations and mapping include Cederberg Wines; Western Cape Department of Agriculture; Vogelfontein Citrus; De Grendel Estate; Zewenwacht Wine Estate; and Goedgedacht Olives.

In 2018 I completed a ground-breaking case study that measured the agricultural impact of existing wind farms in the Eastern Cape.

Soil Science Consultant Agricultural Consultors International (Tinie du Preez) 1998 - 2001

Responsible for providing all aspects of a soil science technical consulting service directly to clients in the wine, fruit and environmental industries all over South Africa, and in Chile, South America.

Contracting Soil Scientist De Beers Namaqualand Mines July 1997 - Jan 1998

Completed a contract to advise soil rehabilitation and re-vegetation of mined areas.

Publications

- Lanz, J. 2012. Soil health: sustaining Stellenbosch's roots. In: M Swilling, B Sebitosi & R Loots (eds). *Sustainable Stellenbosch: opening dialogues*. Stellenbosch: SunMedia.
- Lanz, J. 2010. Soil health indicators: physical and chemical. *South African Fruit Journal*, April / May 2010 issue.
- Lanz, J. 2009. Soil health constraints. *South African Fruit Journal*, August / September 2009 issue.
- Lanz, J. 2009. Soil carbon research. *AgriProbe*, Department of Agriculture.
- Lanz, J. 2005. Special Report: Soils and wine quality. *Wineland Magazine*.

I am a reviewing scientist for the *South African Journal of Plant and Soil*.



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

APPENDIX 2: DETAILS OF THE SPECIALIST, DECLARATION OF INTEREST AND UNDERTAKING UNDER OATH

(For official use only)

File Reference Number:

NEAS Reference Number:

Date Received:

DEA/EIA/

Application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

PROJECT TITLE

PROPOSED GRID CONNECTION FROM PAARDE VALLEY PV2 TO VETLAAGTE MAIN TRANSMISSION SUBSTATION NEAR DE AAR, NORTHERN CAPE PROVINCE

Kindly note the following:

- This form must always be used for applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting where this Department is the Competent Authority.
- This form is current as of 01 September 2018. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at <https://www.environment.gov.za/documents/forms>.
- A copy of this form containing original signatures must be appended to all Draft and Final Reports submitted to the department for consideration.
- All documentation delivered to the physical address contained in this form must be delivered during the official Departmental Officer Hours which is visible on the Departmental gate.
- All EIA related documents (includes application forms, reports or any EIA related submissions) that are faxed; emailed; delivered to Security or placed in the Departmental Tender Box will not be accepted, only hardcopy submissions are accepted.

Departmental Details

Postal address: Department of Environmental Affairs, Attention: Chief Director: Integrated Environmental Authorisations, Private Bag X447, Pretoria, 0001

Physical address: Department of Environmental Affairs, Attention: Chief Director: Integrated Environmental Authorisations, Environment House, 473 Steve Biko Road, Arcadia

Queries must be directed to the Directorate: Coordination, Strategic Planning and Support at:

Email: EIAAdmin@environment.gov.za

1. SPECIALIST INFORMATION

Specialist Company Name:	Johann Lanz – Soil Scientist		
B-BBEE	Contribution level (indicate 1 to 8 or non-compliant)	4	Percentage Procurement recognition
Specialist name:	Johann Lanz		
Specialist Qualifications:	M.Sc. (Environmental Geochemistry)		
Professional affiliation/registration:	Registered Professional Natural Scientist (Pr.Sci.Nat.) Reg. no. 400268/12		
Physical address:	Member of the Soil Science Society of South Africa		
Postal address:	1a Wolfe Street, Wynberg, Cape Town, 7800		
Postal code:	7800	Cell:	082 927 9018
Telephone:	082 927 9018	Fax:	Who still uses a fax? I don't
E-mail:	johann@johannlanz.co.za		

2. DECLARATION BY THE SPECIALIST

I, **Johann Lanz**, 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

Johann Lanz – Soil Scientist (sole proprietor)

Name of Company:

Date: 02/06/2022

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, **Johann Lanz**, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

Johann Lanz – Soil Scientist (sole proprietor)

Name of Company

Date: 02/06/2022

Signature of the Commissioner of Oaths

Date



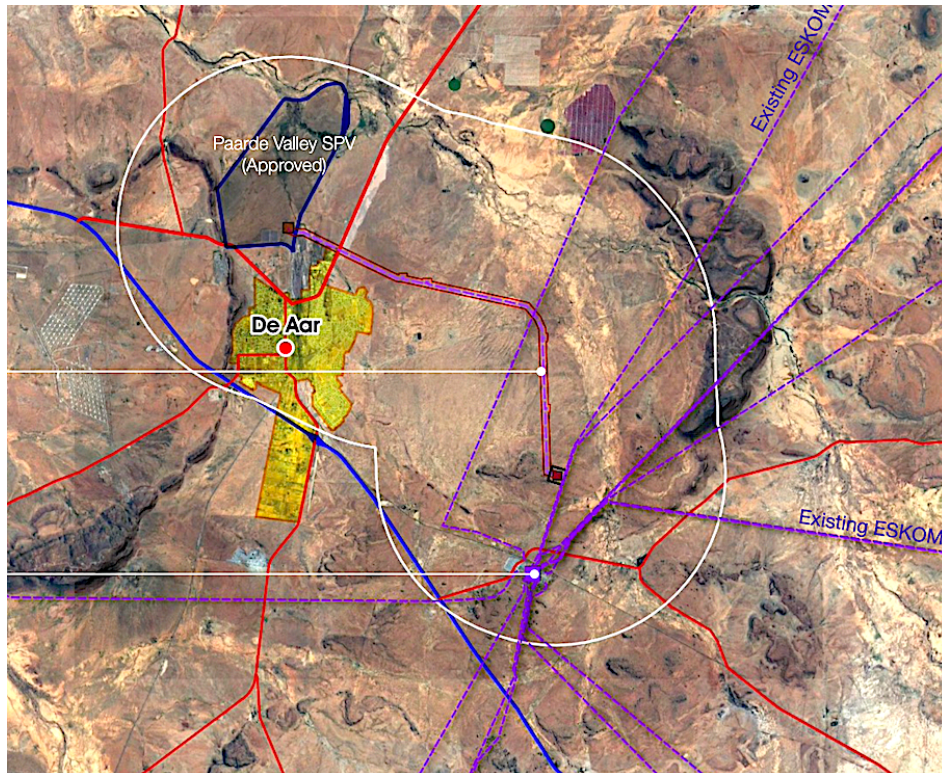
Appendix C2: Visual Specialist

Proposed Paarde Valley PV2 Grid Connection
to Vetlaagte Main Transmission Substation
Near De Aar, Northern Cape Province

for Paarde Valley PV2 (Pty) Ltd

Preliminary Visual Screening

28 March 2022
Updated 05 April 2022



Prepared for
Holland & Associates Environmental Consultants

Prepared by
Quinton Lawson Architect (qarc)
Bernard Oberholzer Landscape Architect (bola)

1 Introduction

The currently authorised 132kV/ 220kV grid connection for Paarde Valley PV2 is routed from the Paarde Valley PV2 facility to the De Aar substation. Because of Eskom's grid capacity constraints the Applicant wishes to amend the authorised grid connection (realignment and termination point) and create a separate Environmental Assessment for ESKOM's self-build components (substation & gridline). This would involve the construction of a 132kV overhead powerline from the authorised on-site substation at Paarde Valley PV2 to Vetlaagte Main Transmission Station.

The intention of the visual screening study is to assist in identifying any potential no-go areas for the proposed grid connection and IPP switching station. The visual screening involved a desktop study and field work to identify visual / scenic features and potential sensitive receptors, along with visual sensitivity mapping for the proposed development.

2. Project Description

The overhead powerline would be approximately 12.7 km in length, and is located in the Strategic Transmission Central Corridor. A 200 m corridor (100 m of each side of the line) is being assessed. The final servitude would be 31 m but during design development process a corridor of 200 meters is required to allow for minor tower position adjustments. (See **Maps 1 and 2**).

Exact pylon locations would be determined by specialist investigations and engineering considerations. On average there would be 4 - 5 towers per km, so that the route will consist of approximately 40 towers. The line would have a capacity of >150MVA and make use of either a steel monopole or steel lattice structure in line with Eskom specifications. (Holland & Assoc. March 2022).

The route selected follows boundary lines and / or existing powerline routes to limit disruption to current farming activities as much as possible. The infrastructure associated with the proposed Grid Connection includes the following:

- A 132kV overhead powerline from the PV2 switching station to the proposed Vetlaagte Main Transmission Substation.
- An on-site Switching Station (approx. 100x100m) adjacent to the IPP collector substation.

Technical details include:

- Height of pylons up to 32m
- Type of poles/ pylons either steel lattice or monopole structures
- Transmission capacity 132kV
- Permanent and construction laydown areas +-4 Hectares
- Area occupied by buildings +-1.0Hectares
- Length of service road – twin-tracked service road following line route only
- Width of service roads 6m (8m including V-drains) to access Eskom switching station from nearest road.
- Height of fencing 2m
- Type of fencing Palisade + farmers fencing for temporary works
- Capacity of on-site substation 132kv

3. Screening Assessment Methodology

Landscape features and sensitive receptors were mapped using 1:50 000 survey maps, Google Earth satellite imagery and field observations. Recommended buffers for grid connection powerlines were overlaid on the maps. Potential conflicts could then be identified to inform a preferred route for the grid connection.

4. Site Sensitivity Verification

The DFFE sensitivity screening tool report, downloaded by Holland & Associates (15 Dec. 2021), identifies a landscape / visual impact assessment protocol for inclusion in the assessment report. The DFFE's Report does not include a map of Relative Landscape Sensitivity for the proposed grid connection. Detailed visual sensitivity mapping at the project scale is however included in this Report.

5. Description of the Study Area

A brief description of the landscape and scenic features of the study area are given below, and in the accompanying photographs (Figures 1 to 3). The route taken during the field trip is indicated in green on **Map 3**.

The study area lies within an expansive flattish landscape, composed of Ecca Group shales, while a series of flat-topped dolerite koppies occur to the north-east of the study area, as well as to the west of the proposed Paarde Valley Solar PV. The elevation ranges from 1000 to 1500m in the region.

The town of De Aar lies about 1 km to the south of the proposed grid connection, and a few scattered farmsteads occur to the north and west. The De Aar Nature Reserve lies to the west of the town.

The vegetation is Northern Upper Karroo type (Mucina and Rutherford, 2006), consisting of dwarf shrubland and grassland. The grassland was unusually lush after the good summer rains experienced this year in the region.

The main agricultural activity is open-range sheep farming with both merino and dorper sheep occurring. There are a number of existing Eskom powerlines within the study area corridor.

6. Visual Sensitivity Mapping

Landscape features of visual or scenic value, along with potential sensitive receptors in the surroundings, are listed in Table 1 below. Visual features are indicated on **Map 5**.

Table 1: Typical Scenic Features and Sensitive Receptors

Landscape features within or adjacent to the grid corridor.	
Topographic features	The study area consists of relatively flat grassy plains.
Water Features	There are a few minor drainage courses in the study area, which are not of visual significance.
Cultural landscapes	Besides De Aar, the study area contains a few modest farmsteads with tree copses, grazing pasture and minimal cultivation.
Receptors adjacent to the grid corridor or in the local surroundings.	
Protected Areas	There is a Municipal Nature Reserve, known as the De Aar Nature Reserve immediately to the west of the town boundary.
Human settlements	The nearest settlement is De Aar about 1 km away.
Scenic and arterial routes	The proposed grid connection crosses a railway line and the R48 between De Aar and Philipstown.

Scenic resources and sensitive receptors within the study area have been categorised into no-go, high sensitivity, medium and low visual sensitivity zones, for the proposed grid connection, as indicated in Table 2. The visual sensitivity mapping categories are indicated on **Map 6**.

Table 2: Visual Sensitivity Mapping Categories for Proposed 132kV Connecting Powerline

Scenic Resources	Very high sensitivity (No-go)	High visual sensitivity	Medium visual sensitivity	Low visual sensitivity
Topographic features n/a	Feature	Within 150m	-	-
Steep slopes n/a	-	Slopes > 1:4	Slopes > 1:10	-
Drainage courses	Feature	Within 50m	-	-
Cultural landscapes n/a	within 100m	within 150m	Within 250m	
Protected Landscapes / Sensitive Receptors				
Municipal nature reserve	within 250m	within 500m	Within 1 km	-
Towns and settlements	within 250m	within 500m	Within 1 km	-
Farmsteads outside site	within 250m	within 500m	Within 1 km	-
Arterial / district routes ¹	within 100m	within 250m	-	-
Local airfields	Within 3 km	-	-	-

Note ¹ : Except where powerlines cross roads at roughly right angles.

Visibility:

Estimated degrees of visibility based on the scale of the 32m pylons and related infrastructure, and on distance from various viewpoints are indicated in Table 3 below:

Table 3: Degrees of Visibility of Proposed SEF and Related Infrastructure

Very high visibility	0-500m	Prominent feature within the observer's view frame
High visibility	500m-1km	Relatively prominent within observer's view frame
Moderate visibility	1-2km	Only prominent as part of the wider landscape
Low visibility	2-4km	Visible as a minor element in the landscape
Very low visibility	>4km	Hardly visible with the naked eye in the distance

Possible degrees of visibility from a number of viewpoints are indicated in Table 4 below. Visibility of lights at night would not be significant because of the localised need for lighting and the distance of receptors. Visibility of the proposed grid connection would be greatest where it crosses the R48, and less so from the northern part of De Aar, because of railway infrastructure in the foreground. To the east a number of existing Eskom powerlines already clutter the landscape.

Visual Exposure: (Map 4)

The viewshed, or zone of visual influence of the proposed grid connection potentially extends for some 4 to 5km, but is restricted by low hills to the west, where the surrounding area is in a view shadow. The viewshed of the proposed switching station would be fairly localised.

Table 4: PV2 Viewing Distances and Potential Visibility from Receptors

View-point		Latitude	Longitude	Distance to powerline	Potential Visibility
VP1	R68 Route	30.608777S	24.036920E	2.6 km	Low visibility.
VP2	Plessisdam	30.613773S	24.053968E	2.7 km	Low visibility.
VP3	De Aar North	30.631486S	24.026335E	70 m	High visibility.
VP4	De Aar NE corner	30.643383S	24.034956E	926 m	High visibility.
VP5	Near Lochinvar	30.659050S	24.046920E	2.3 km	Moderate visibility.
VP6	Merino	30.635874S	24.134207E	4.6 km	Low visibility.
VP7	Vetlaagte	30.671730S	24.102561E	1.1 km	Moderate visibility.
VP8	Wag-'n-Bietjie	30.711882S	24.115039E	3.0 km	Low visibility.
VP9	Badenhorstdam	30.698230S	24.049410E	4.2 km	Low visibility. View shadow
VP10	De Aar NW	30.640790S	24.005008E	1.7 km	Moderate visibility.
VP11	De Poort	30.604511S	24.972662E	4.4 km	Low visibility. View shadow

The visual sensitivity categories in relation to the mapping are outlined in Table 5 below.

Table 5: Visual Sensitivity Categories

No Go	Areas or features considered of such sensitivity or importance that any adverse effects upon them may be regarded as a fatal flaw.
High	Development to be limited and remain within acceptable limits of change determined by the specialist, and comply with restrictions or mitigation measures identified by the specialist.
Medium	Areas considered to be developable, but to remain within acceptable limits of change as determined by the specialist, and comply with restrictions or mitigation measures identified by the specialist.
Low	Low sensitivity areas that are considered to be developable. However specialists may still wish to define acceptable limits of change where necessary.

7. Preliminary Visual Indicators

Aspects of areas with potential visual impact significance for the proposed grid connection, are indicated on **Map 6**.

The proposed grid connection corridor could moderately affect the residential areas along the northern edge of De Aar while surrounding farmsteads to the east tend to be more than a kilometre away. A number of existing Eskom powerlines already occur in the study area.

The proposed grid connection and IPP switching station would not represent any fatal flaws in visual terms. Micro-siting of pylons and access / maintenance roads may be required.

References

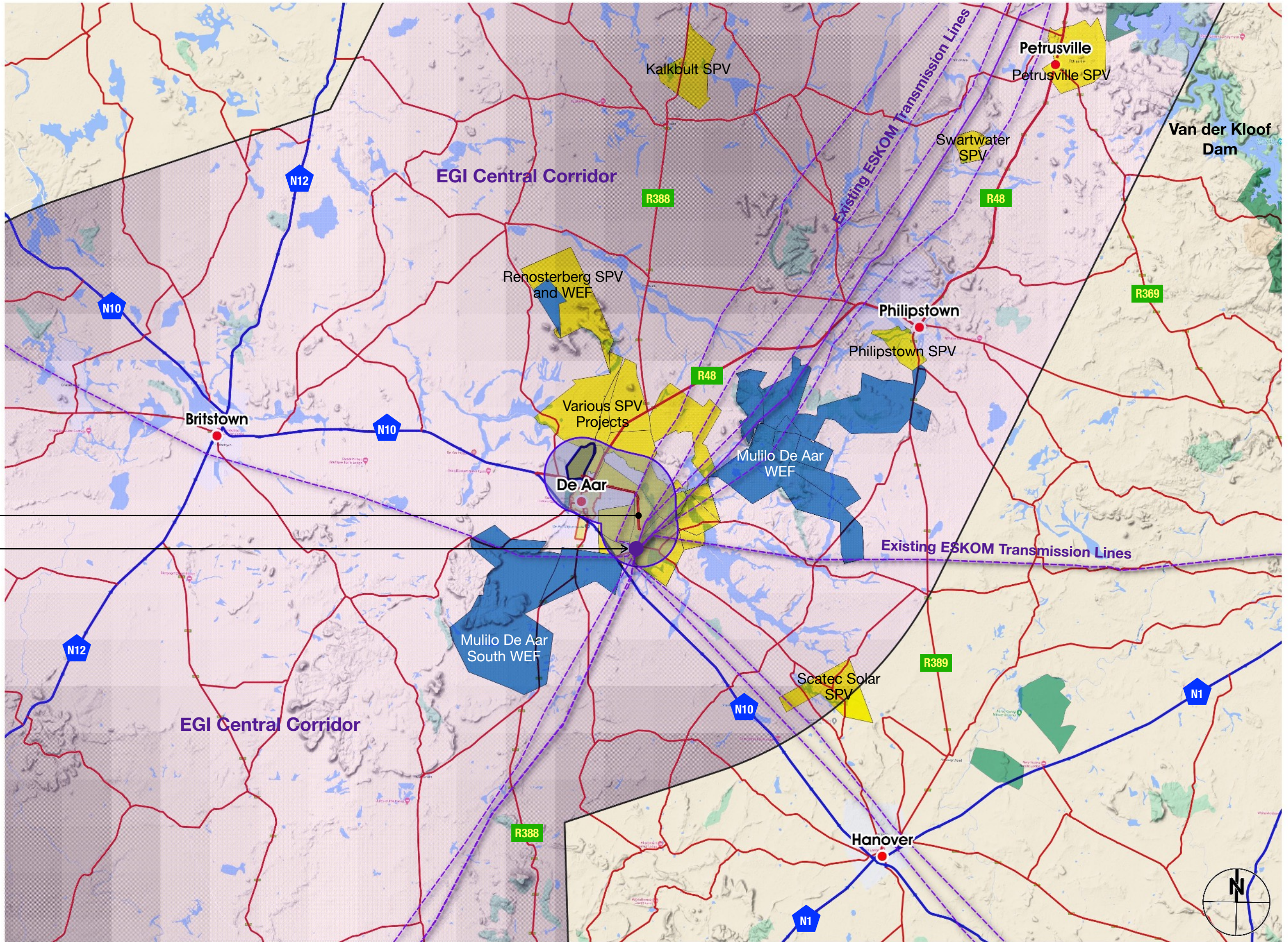
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Mucina L. and Rutherford MC. 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19, SANBI, Pretoria.

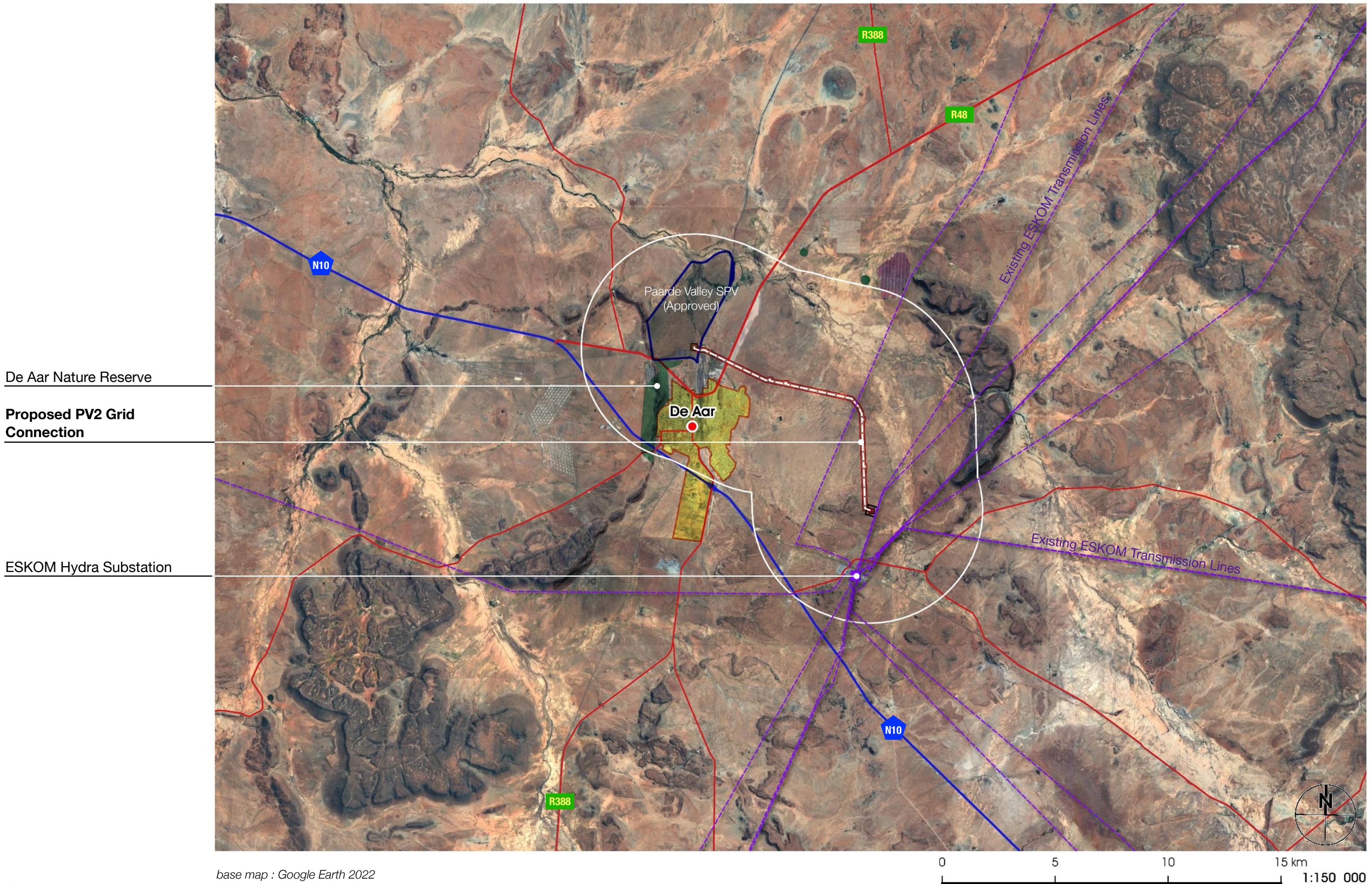
**Proposed PV2 Grid
Connection within 5km buffer**

ESKOM Hydra Substation



base map : Google Maps Terrain 2022

map 1 : Paarde Valley PV2 Grid Connection : Regional Locality • REEA Projects Q3 2021



map 2 : Paarde Valley PV2 Grid Connection : Local Context

Legend :

-  Field Track
-  Viewpoints

PV2 IPP Facility Substation

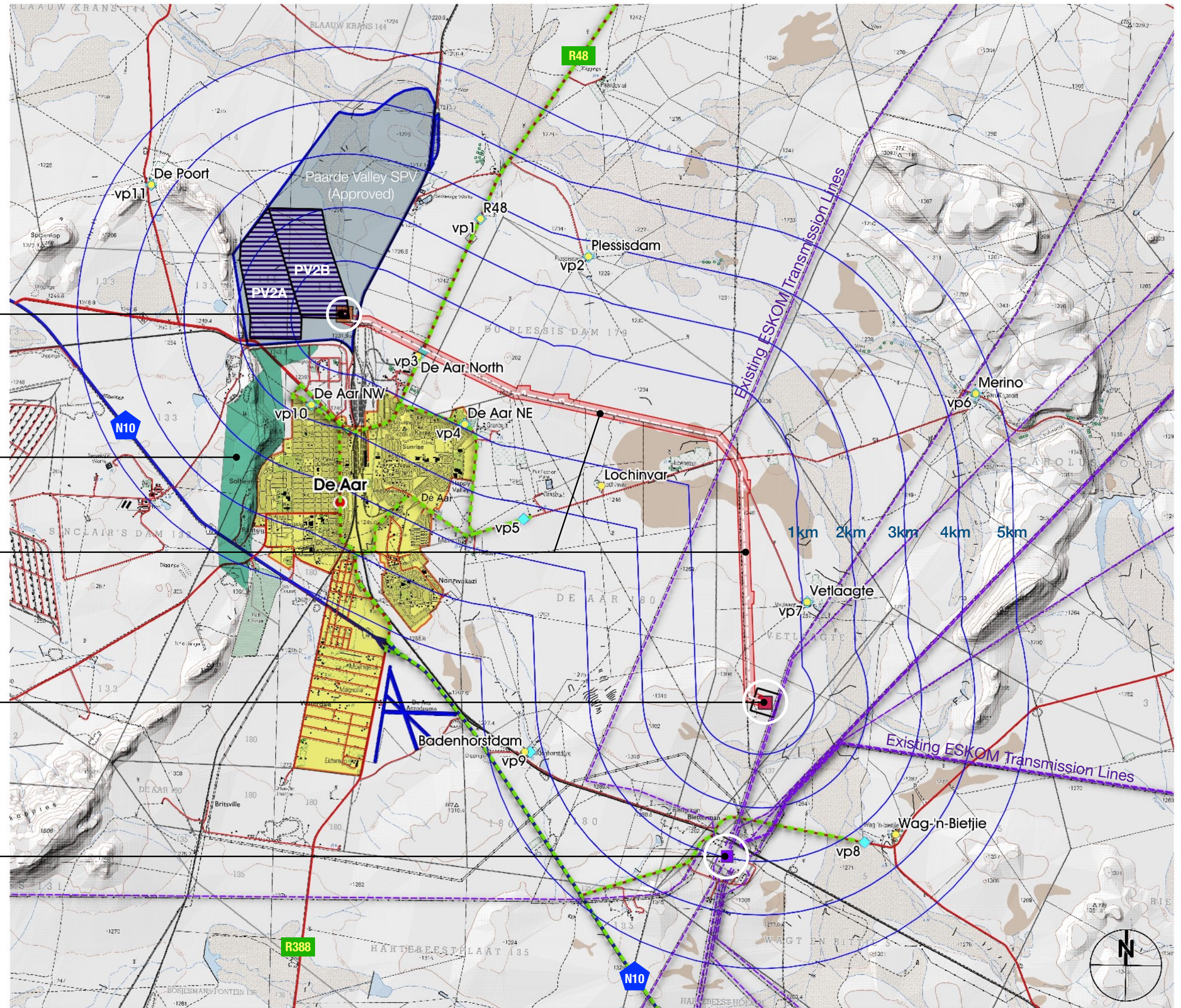
De Aar Nature Reserve

Proposed PV2 Grid Connection

In 200m wide corridor

Vetlaagte Substation

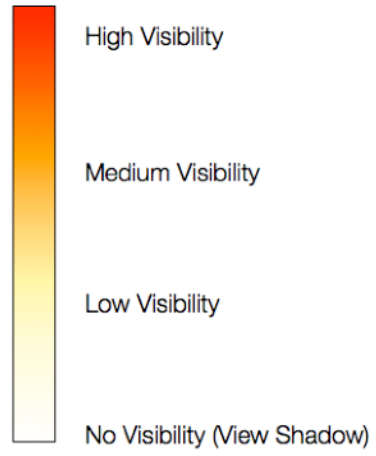
ESKOM Hydra Substation



base map : NGI 50K Topographic Series : 3024 CA De Aar, 3024 DB Brand

map 3 : Paarde Valley PV2 Grid Connection : Layout and Fieldwork

Viewshed Legend :



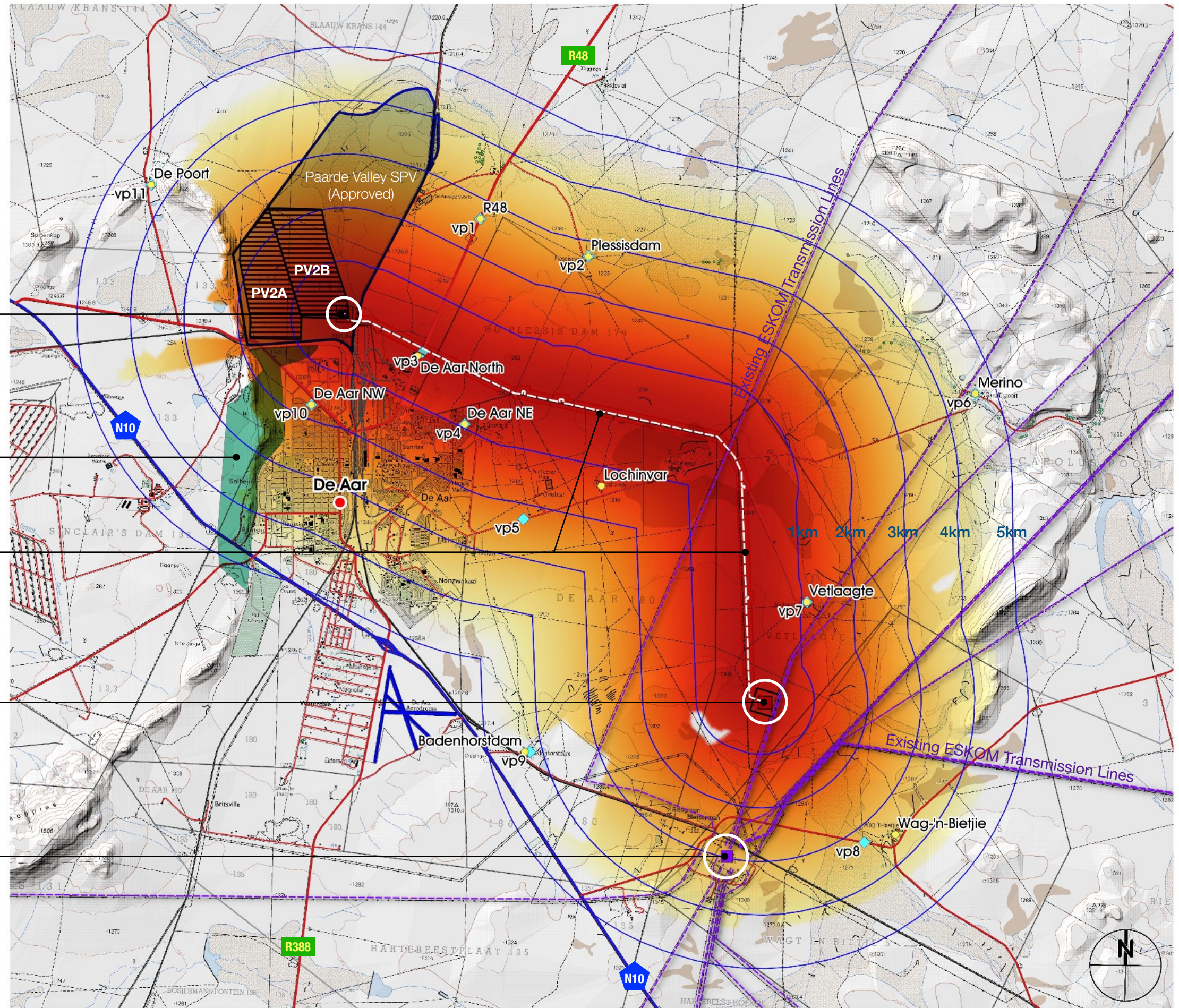
PV2 IPP Facility Substation

De Aar Nature Reserve

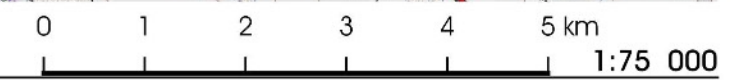
Proposed PV2 Grid Connection

Vetlaagte Substation

ESKOM Hydra Substation












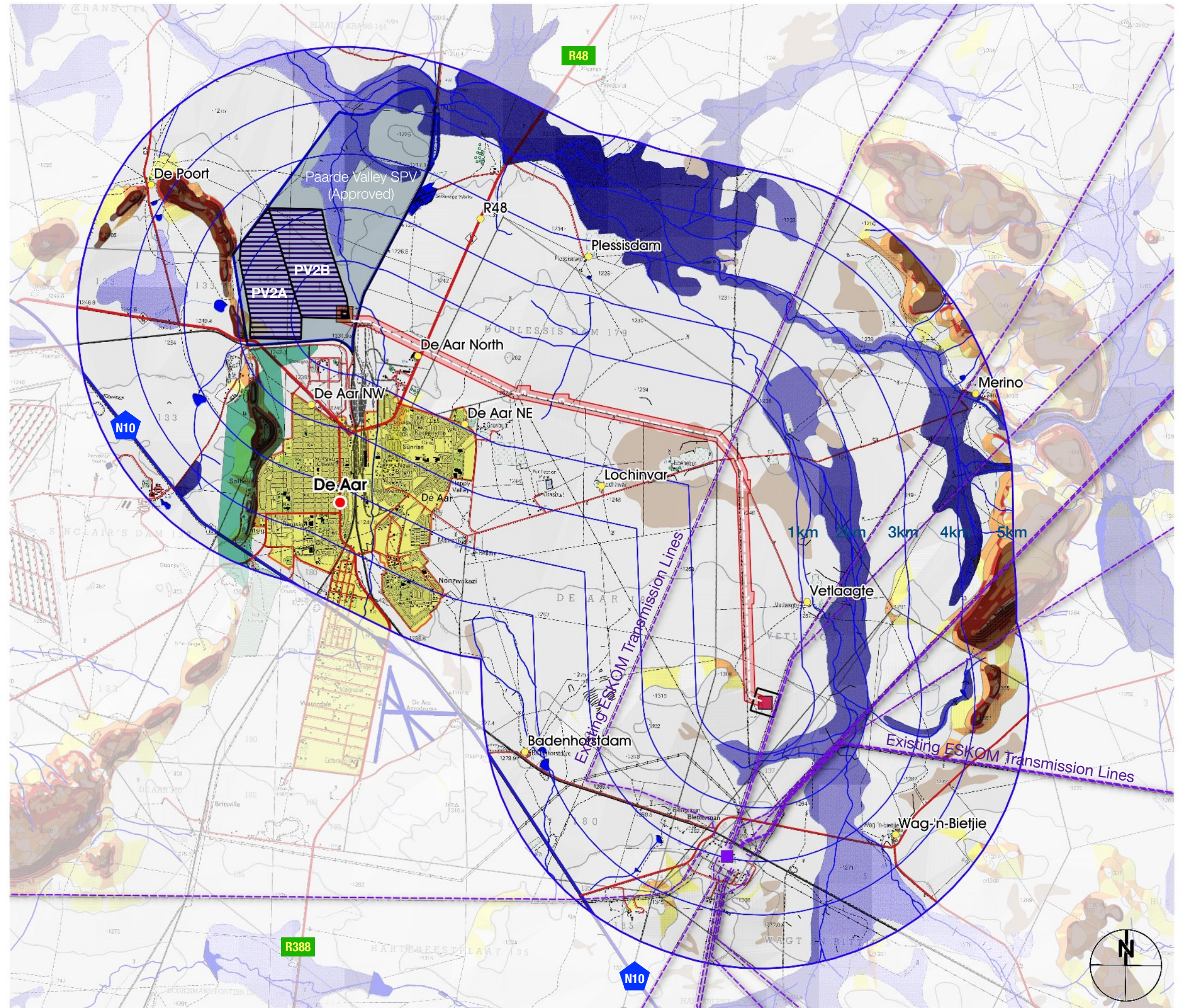
base map : NGI 50K Topographic Series : 3024 CA De Aar, 3024 DB Brand



map 4 : Paarde Valley PV2 Grid Connection : Nominal Viewshed • Pylons 32m high

Legend :

-  Topographic Features
-  **YELLOW** <1:10 slopes
ORANGE 1:10 - 1:4 slopes,
RED >1:4 + slopes
-  Drainage Courses
-  De Aar Nature Reserve
-  Urban Area
-  Visual Receptors
-  National Road
-  District Roads
-  Airfield



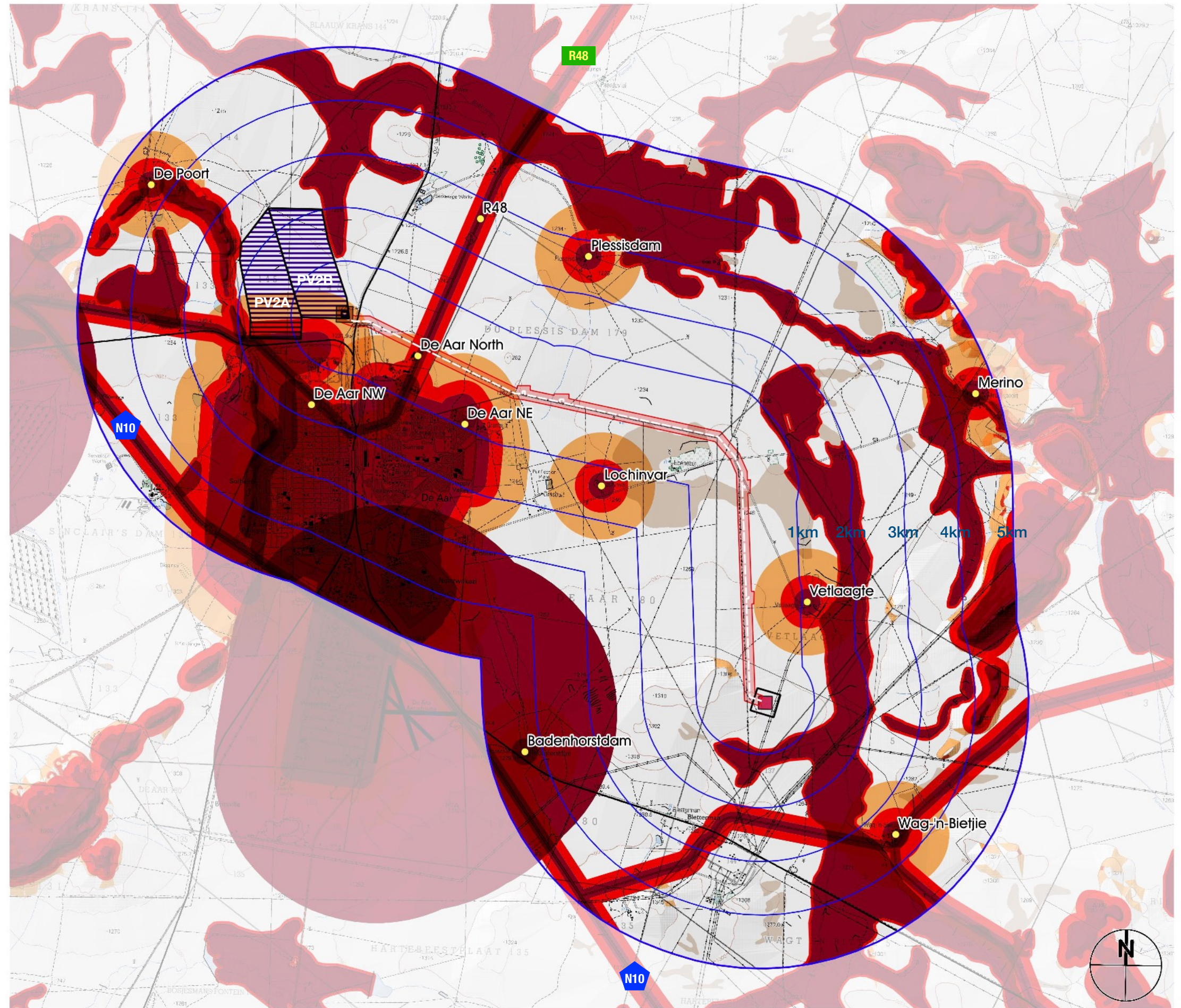
base map : NGI 50K Topographic Series : 3024 CA De Aar, 3024 DB Brand

map 5 : Paarde Valley PV2 Grid Connection : Visual Features

0 1 2 3 4 5 km
1:75 000

VISUAL SENSITIVITY

- Very High - NoGo
- High Visual Sensitivity
- Medium Visual Sensitivity
- Low Visual Sensitivity



base map : NGI 50K Topographic Series : 3024 CA De Aar, 3024 DB Brand

map 6 : Paarde Valley PV2 Grid Connection : Visual Sensitivity

0 1 2 3 4 5 km
1:75 000



vp1 : Looking South from R48 towards De Aar

30.608777S 24.036920E Distance 2.6km



vp3 : Looking North-East from R48 at Grid Connection Crossing

30.631486S 24.026335E Distance 70m

Figure 1 : Paarde Valley Grid Connection : Viewpoint Panoramas



vp4 : Looking North-East from De Aar NE Outskirts

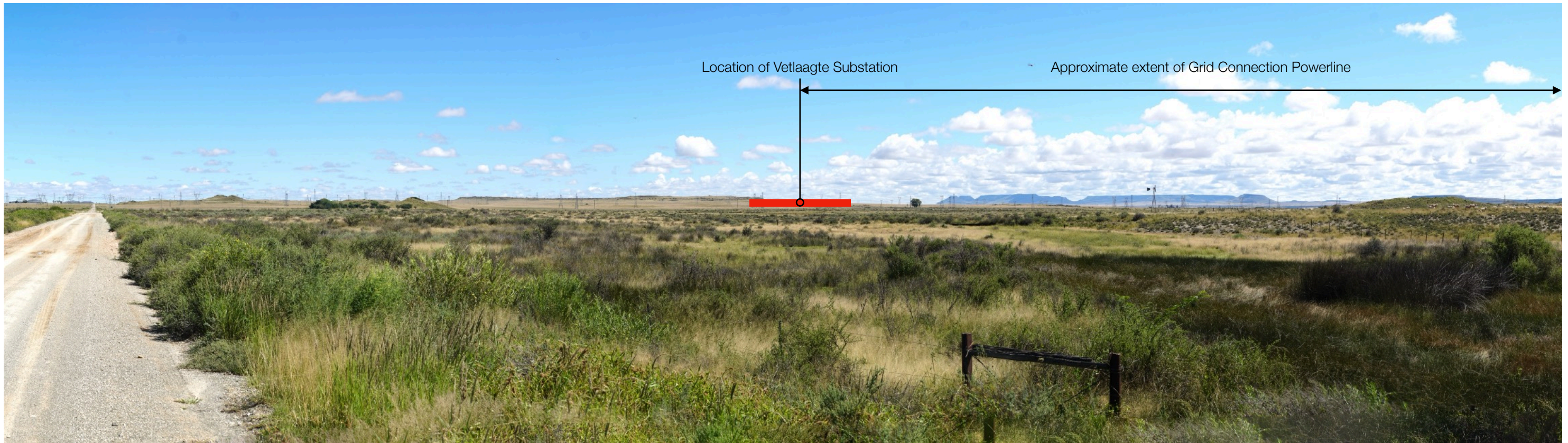
30.643383S 24.034956E Distance 926m



vp5 : Looking North-East from District Road near Lochinvar

30.659050S 24.046920E Distance 2.3km

Figure 2 : Paarde Valley Grid Connection : Viewpoint Panoramas



vp8 : Looking West from District Road near Wag-'n-Bietjie

30.711882S 24.115039E Distance 3.0km



vp10 : Looking North from De Aar NW Outskirts

30.640790S 24.005008E Distance 1.7km

Figure 3 : Paarde Valley Grid Connection : Viewpoint Panoramas

Appendix C3: Archaeological and Cultural Heritage Specialist

APPENDIX 2 – Site Sensitivity Verification

As required in Part A of the Government Gazette 43110, GN 320, a site sensitivity verification was undertaken in order to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool. The details of the site sensitivity verification are noted below:

<i>Date of Site Visit</i>	
<i>Specialist Name</i>	Dr Jayson Orton
<i>Professional Registration Number</i>	ASAPA: 233; APHP: 043
<i>Specialist Affiliation / Company</i>	ASHA Consulting (Pty) Ltd

Method of the Site Sensitivity Verification

Initial work was carried out using satellite aerial photography in combination with the author's accumulated knowledge of the local landscape. This was used to determine areas of potential sensitivity that should be focused on during the fieldwork. Two such areas were identified: the banks of the Brak River in the north and a low, rocky dolerite hill in the south. The site was then ground truthed, including areas identified as potentially sensitive. Desktop research was also used to inform on the heritage context of the area. This information is presented in the report (Sections 5.2.1 and 5.4.1).

Outcome

The map below is extracted from the screening tool report and shows the archaeological and heritage sensitivity to be low but with small spots of high scattered through the wider area. The site visit showed that in fact the entire study area is of low sensitivity with only heritage resources of very low cultural significance being found. A photographic record and description of the relevant heritage is contained within the impact assessment report.

The palaeontological component is dealt with in the relevant specialist report.

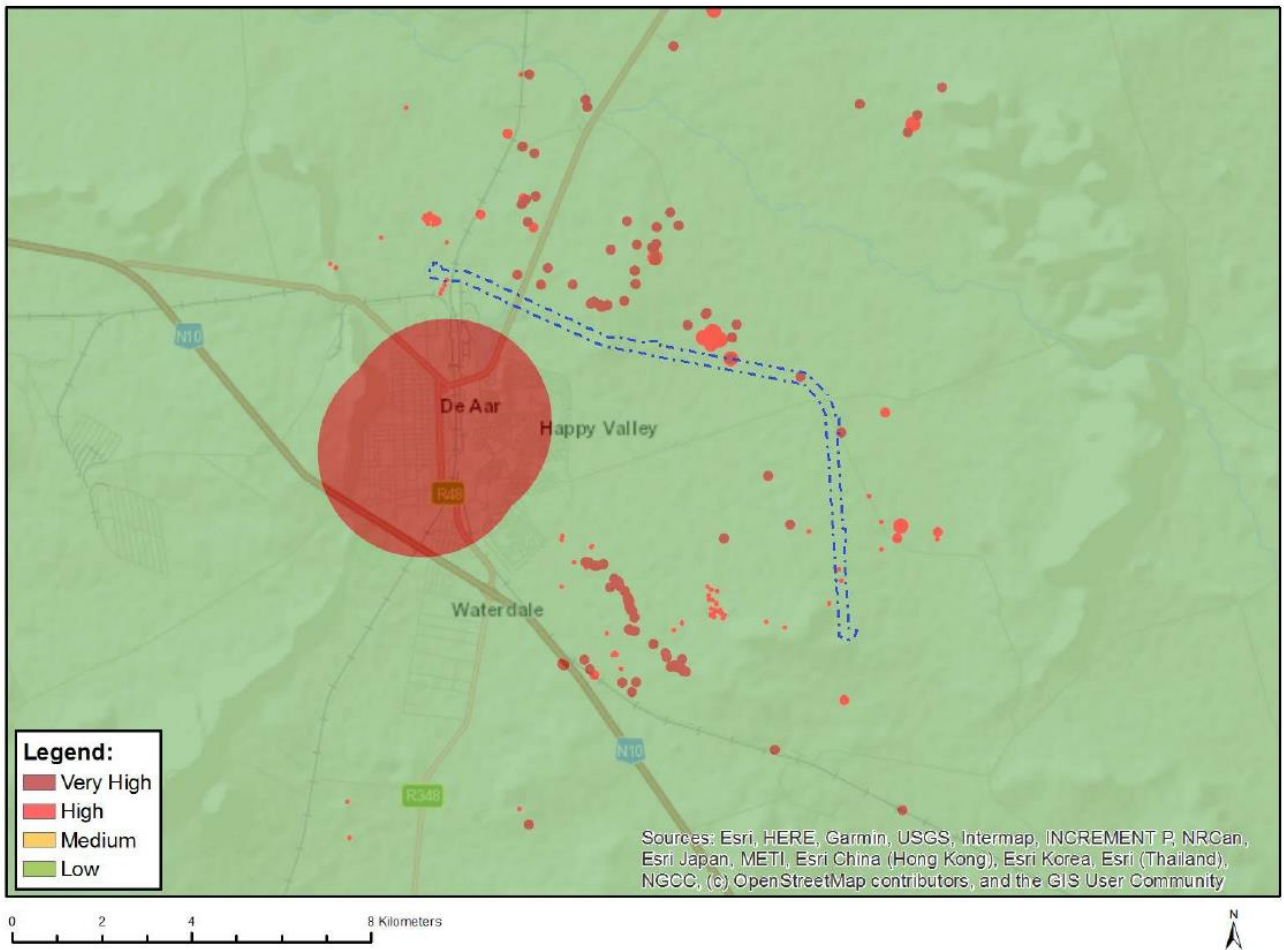


Figure A2.1: Screening tool map for archaeology and cultural heritage.

Appendix C4: Palaeontology Specialist



PALAEONTOLOGICAL SITE
SENSITIVITY VERIFICATION

PAARDE VALLEY PV2 GRID
CONNECTION TO
VETLAAGTE MAIN
TRANSMISSION
SUBSTATION (MTS)

NORTHERN CAPE PROVINCE
2022

COMPILED FOR:
HOLLAND & ASSOCIATES
ENVIRONMENTAL CONSULTANTS

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1 INTRODUCTION

Paarde Valley PV2 (Pty) Ltd proposes the construction of a 132 kV, double circuit, overhead powerline (OHPL) grid connection from the authorised on-site substation and switching station at Paarde Valley PV2 to Vetlaagte Main Transmission Station (MTS) (which is currently undergoing its own EA application process). The OHPL is proposed to be approximately 12.7 km in length, and is located in the Strategic Transmission Central Corridor¹. A 200 m corridor (100 m of each side of the line) is to be assessed. The final OHPL servitude will be registered as 31 m but during the design development process a corridor of 200 meters is required to allow for minor tower position adjustments.

The infrastructure associated with the proposed Grid Connection works for the Paarde Valley PV2 project (and to be handed back to Eskom following construction), includes the following

- A 132kV, double circuit Overhead Power Line (OHPL) from the Switching Station connecting to the proposed Vetlaagte Main Transmission Substation (MTS)
- 132kV Feeder Bay at the Vetlaagte MTS
- On-site Switching Station (SWS), adjacent to the authorised IPP 132 kV substation. (Approximately 100 m x 100 m combined)

The technical details include:

Overhead Powerline:

- Height of pylons Up to 32m
- Type of poles/ pylons to be used. Double Circuit configuration. The alternatives under consideration and to be assessed include Steel lattice or Monopole structures in line with Eskom required specifications²
- Transmission line capacity 132kV
- OHPL Service Road (to lie within the OHPL servitude)
 - Length of OHPL service road(s) – Twin tracked service road following line route
 - Width of OHPL service road(s) 6 m

Switching Station:

- Footprint of approximately 50 m – 100 m x 100 m adjacent to IPP Substation
- Area occupied by buildings (Control building, relay room, generator, storage warehouse, water tanks, ablutions) +-1.0 Hectares
- Switching Station Access Road (separate access servitude from the nearest public road to the Switching Station yard)
 - Compacted gravel

¹No. 113 of Government Gazette No. 41445 published 16 February 2018

- Length of access road: +- 2.34 km
- Width of access road: 8 m.
- Security fencing height: 2.4 m
- Type of fencing: Eskom palisade fencing + chain-link fencing for temporary works
- Capacity of on-site switching station 132KV

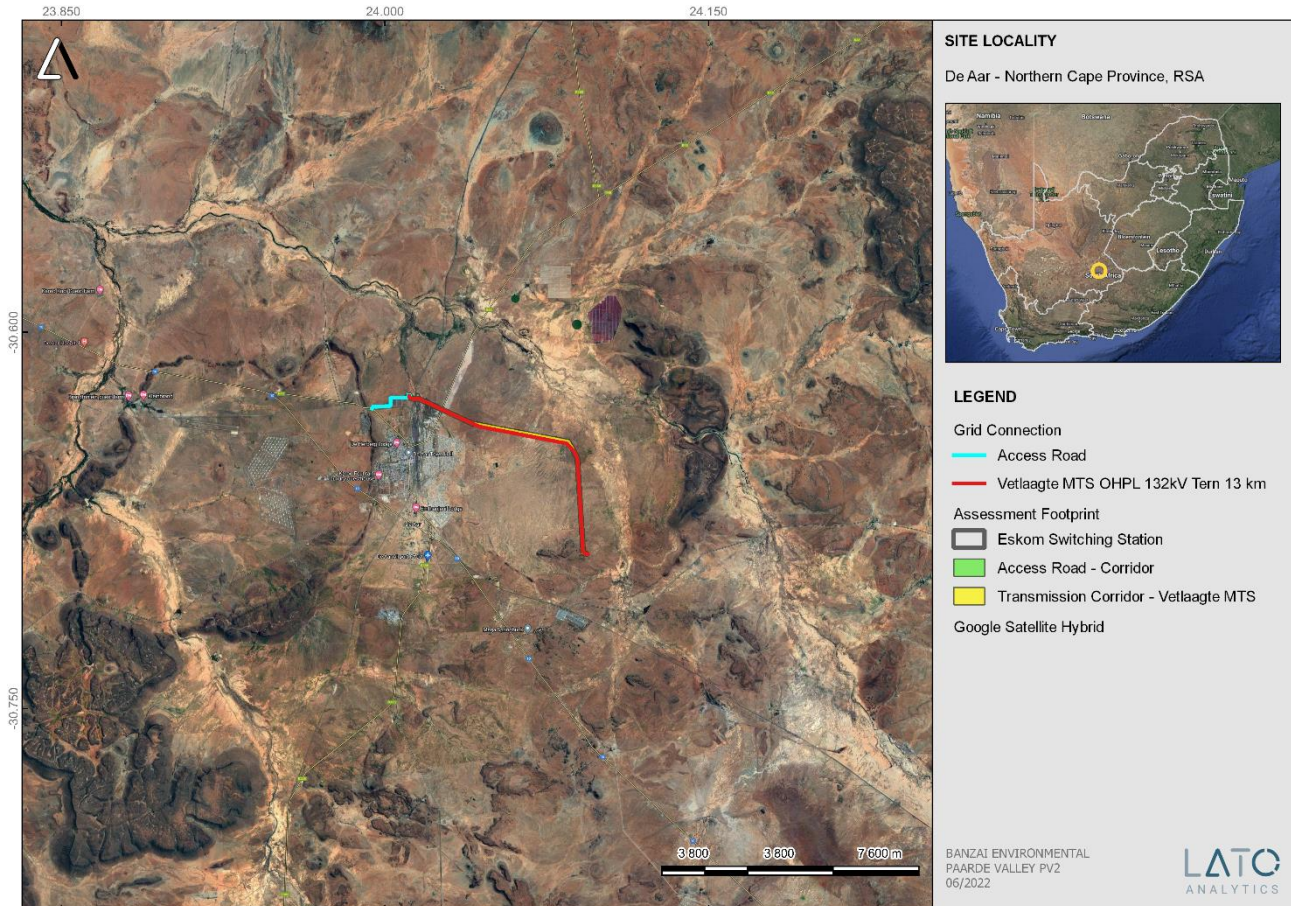


Figure 1: Regional locality for the proposed Paarde Valley PV2 Grid Connection to Vetlaagte MTS, near De Aar in the Northern Cape Province.

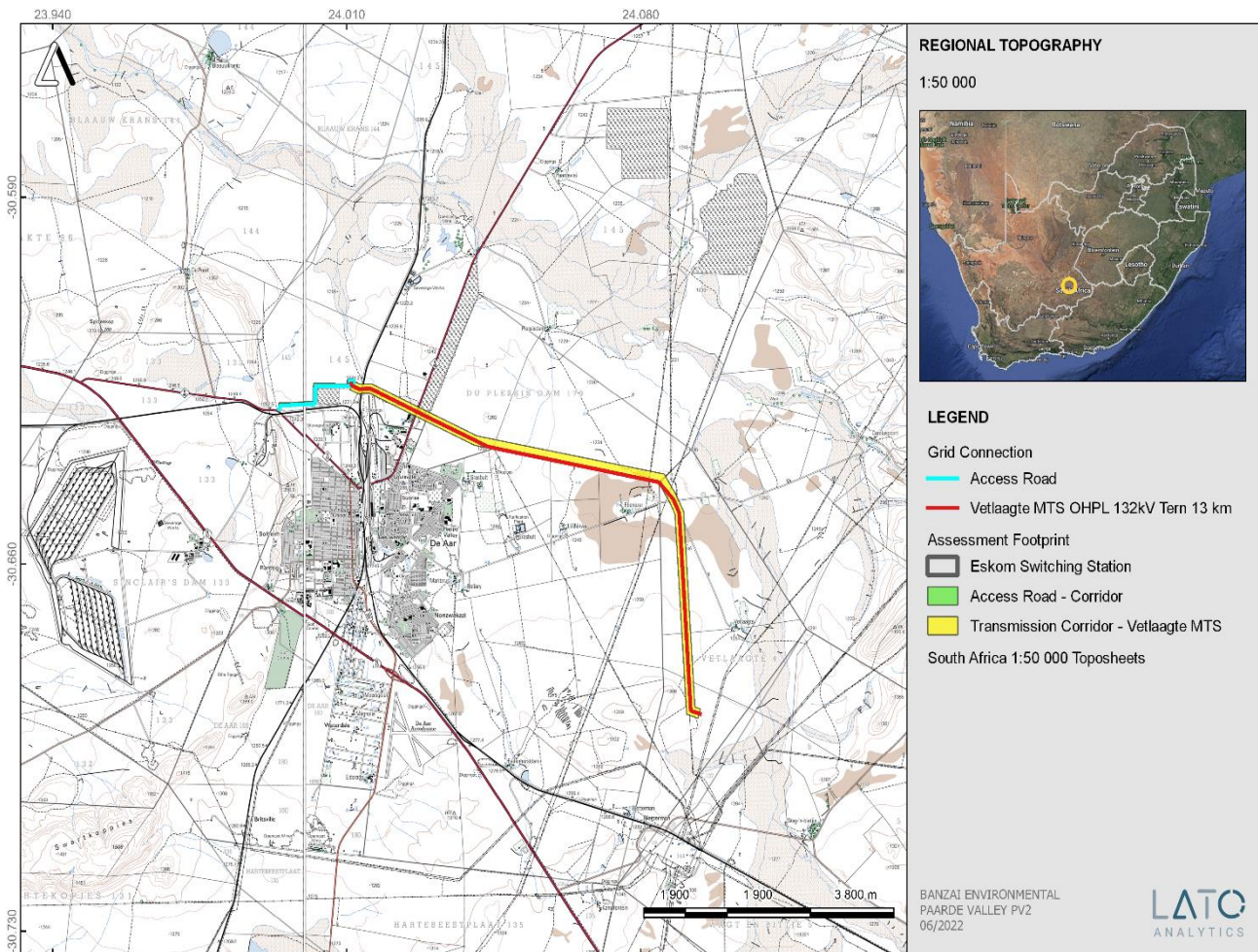


Figure 2: Topography of the proposed Paarde Valley PV2 Grid Connection to Vetlaagte Main MTS, near De Aar in the Northern Cape Province.

In terms of the National Environmental Management Act, 1998 (Act 107 of 1998), as amended (NEMA) Environmental Impact Assessment (EIA) Regulations [4 December 2014, Government Notice (GN) R982, R983, R984 and R985, as amended], various aspects of the proposed development may have an impact on the environment and are considered to be listed activities. These activities require authorisation from the regional Competent Authority (CA), namely the Northern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT), prior to the commencement thereof. One (1) application for EA for the proposed development will be submitted to the DEDEAT, in the form of a BA process, in terms of the NEMA EIA Regulations of 2014.

In accordance with GN 320 (20 March 2020)³ of the NEMA, prior to commencing with a specialist assessment, a site sensitivity verification must be undertaken to confirm the current land use and environmental sensitivity

³ GN 320 (20 March 2020): Procedures for The Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation



of the proposed project area as identified by the National Web-Based Environmental Screening Tool (i.e., Screening Tool). Mrs Elize Butler, as the Palaeontology Specialist, has been commissioned to verify the palaeontology sensitivity of the Paarde Valley PV Grid connection to Vetlaagte Main MTS.

2 SITE SENSITIVITY VERIFICATION METHODOLOGY

The Palaeontology Sensitivity Verification was undertaken by the following methodology:

- The site sensitivity is established through the National Environmental Web-Based Screening Tool
- The Site is mapped on the relevant Geological Map to determine the underlying geology of the development
- Then the site is mapped on the South African Heritage Resources Information System (SAHRIS) PalaeoMap, and the Sensitivity of the proposed development established.
- Other information is obtained by using satellite imagery and
- Palaeontological Impact Assessments and Desktop Assessments of projects in the same area are studied.
- No site visit has been undertaken

3 OUTCOME OF SITE SENSITIVITY VERIFICATION

The geology of the proposed Paarde Valley PV2 Grid Connection to Vetlaagte MTS, near De Aar in the Northern Cape Province is depicted on the 1:250 000 Colesberg 3024 (Le Roux, 1998) Geological map (Council of Geoscience, Pretoria) (**Figure 3**). According to this map the proposed grid connection is underlain by the quaternary alluvium in the far west (pale yellow; Quaternary), followed by a portion of Jurassic dolerite (Jd, red), while the largest portion is underlain by the Tierberg Formation (Pt, yellow-green; Ecca Group, Karoo Supergroup) in the east and south of the development. The most southern tip of the development is underlain by the Adelaide Subgroup (Pa, light green, Beaufort Group, Karoo Supergroup) while the MTS substation is located on Jurassic dolerite.

The PalaeoMap of the South African Heritage Resources Information System indicates that the Palaeontological Sensitivity of the Quaternary alluvium is Moderate, while that of the Tierberg Formation is High and that of the Jurassic Dolerite is Zero/Insignificant. The Palaeontological Sensitivity of the Adelaide Subgroup is Very High (Almond and Pether, 2009; Almond *et al.*, 2013) (**Figure 4**).

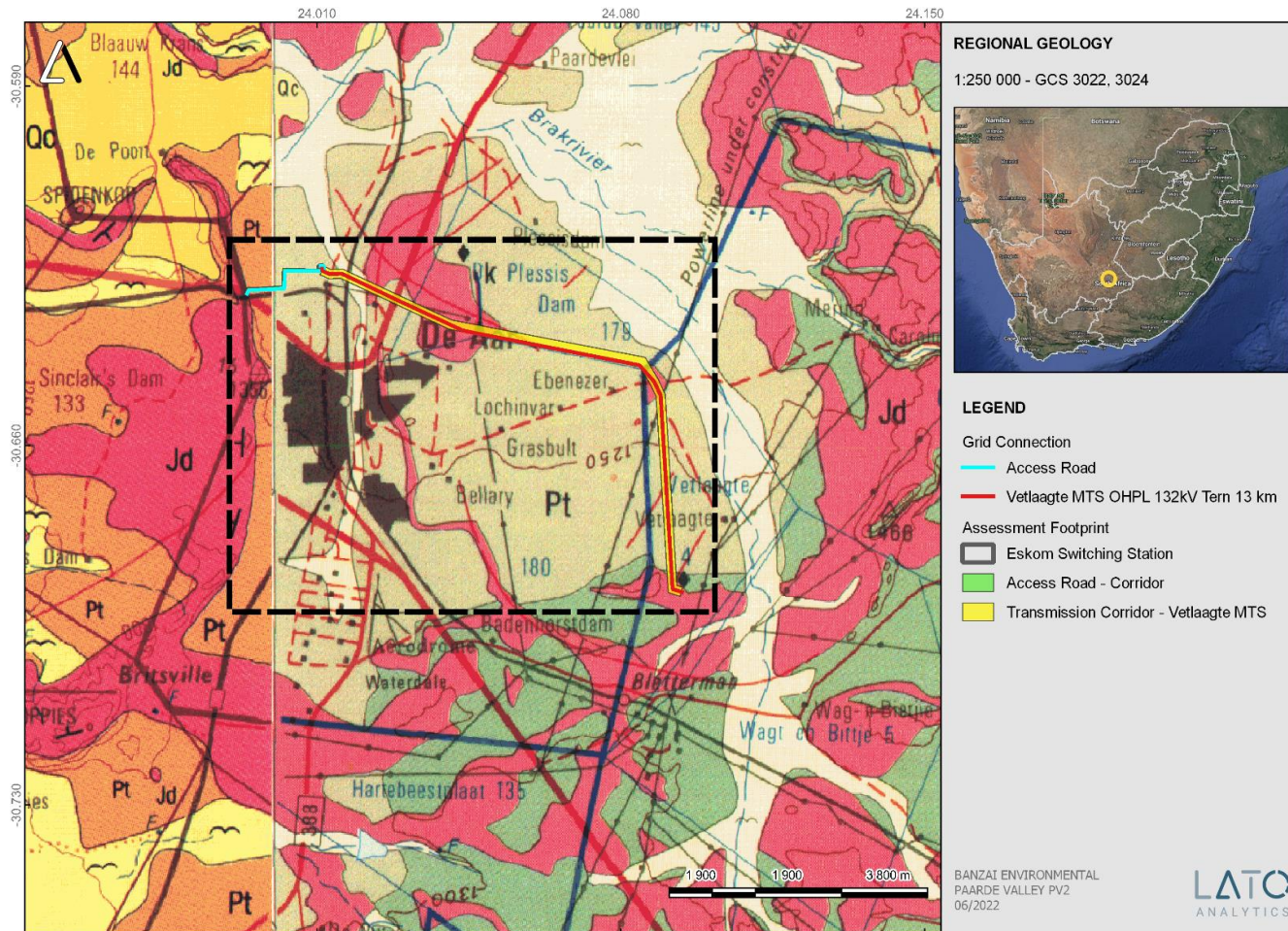
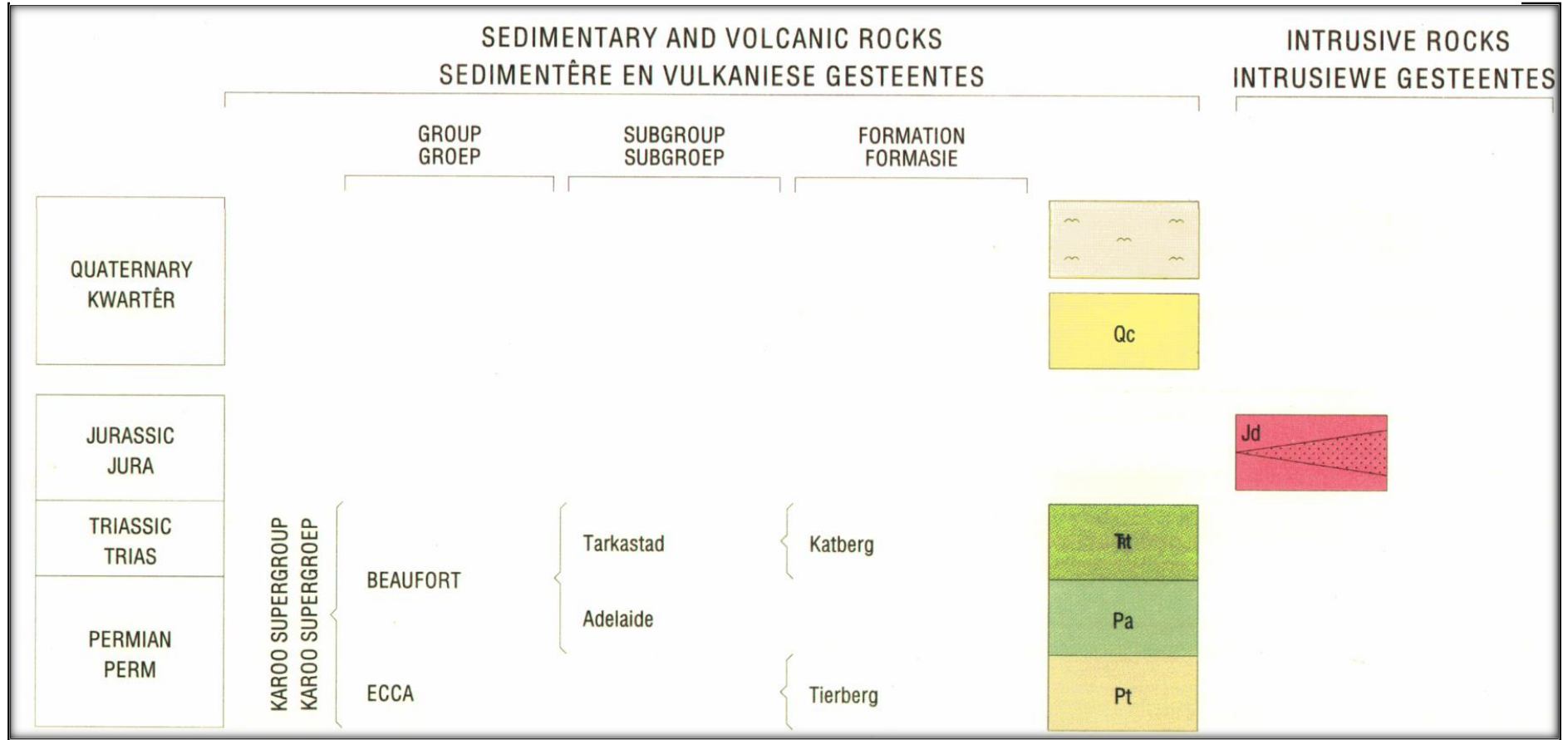


Figure 3: Extract of the 1:250 000 Colesberg 3024 (Le Roux, 1998) and 3022 Britstown (1992) Geological map (Council of Geoscience, Pretoria) indicating the proposed grid connection underlain by quaternary alluvium (pale yellow; Quaternary), Jurassic dolerite (Jd, red), Tierberg Formation (Pt, yellow-brown; Ecca Group, Karoo Supergroup) and Adelaide Subgroup (Pa, light green, Beaufort Group, Karoo Supergroup).

Table 1: Legend of the 1:250 000 Colesberg 3024 (1998) Geological map (Council of Geoscience, Pretoria)





LITHOLOGY / LITOLOGIE

~	Alluvium and debris Alluvium en puin
Qc	Calcrete Kalkreet
Jd	Dolerite, granophyric (); dyke () Doleriet, granofiries (); gang ()
Tt	Yellowish-grey fine-grained sandstone with interbedded brownish-red to grey mudstone Gelerige grys fynkorrelrige sandsteen met tussengelaagde bruinerige tot grys moddersteen
Pa	Blue-grey silty mudstone, subordinate brownish-red mudstone; sandstone Blougrys slikkige moddersteen, ondergeskikte bruinerige rooi moddersteen; sandsteen
Pt	Blue-grey to black shale with carbonate-rich concretions; subordinate siltstone and sandstone in upper part Blougrys tot swart skalie met karbonaatryke konkresies; ondergeskikte sliksteen en sandsteen in boonste gedeelte

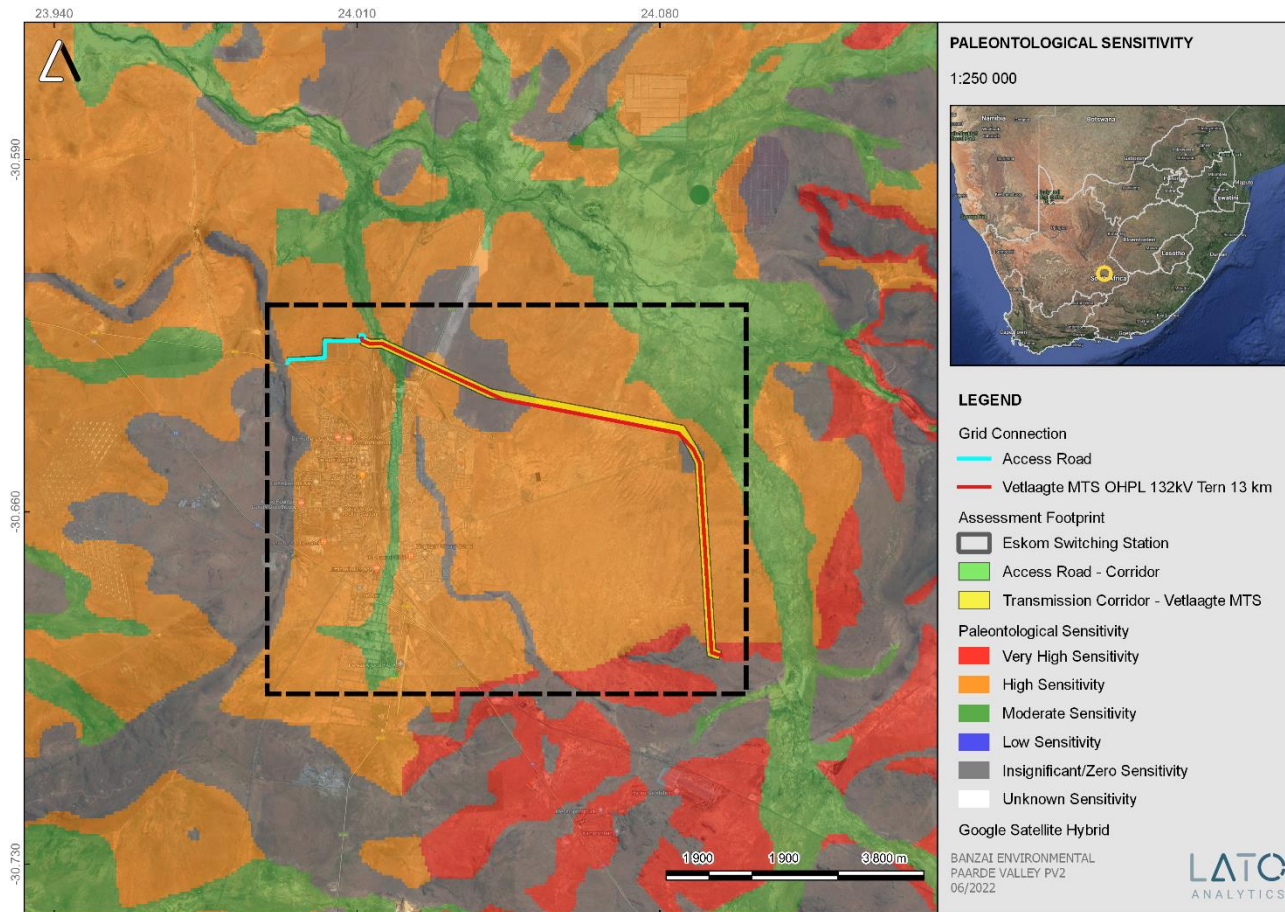


Figure 4: Extract of the 1:250 000 SAHRIS PalaeoMap map (Council of Geosciences, Pretoria) indicating the proposed Paarde Valley PV2 Grid Connection to Vetlaagte MTS, near De Aar in the Northern Cape.

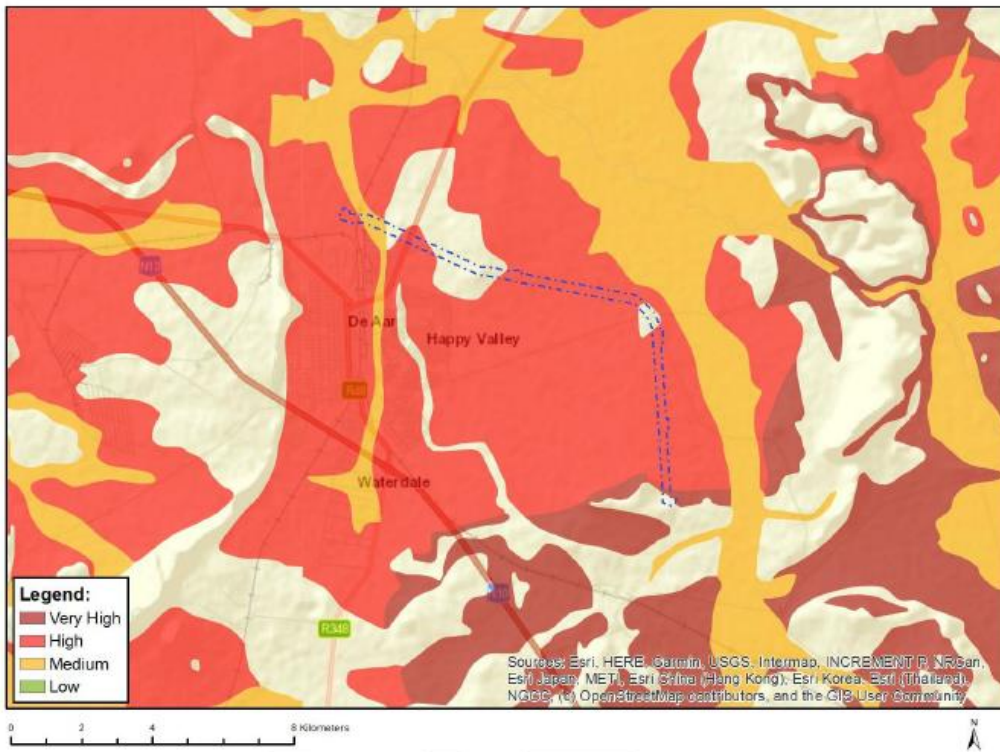
According to the SAHRIS Palaeosensitivity map (**Figure 4**) the proposed development is underlain by sediments of Very High (red), High (orange) and Moderate (green) and Zero (grey) Palaeontological Sensitivity.

Table 2: Palaeontological Significance

Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study; a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

The Sensitivity of rocks in the development is indicated in bold. The colours on the PalaeoMap indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero

MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY



Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
High	Features with a High paleontological sensitivity
Medium	Features with a Medium paleontological sensitivity
Very High	Features with a Very High paleontological sensitivity

Figure 5: Palaeontological Sensitivity generated by the National Environmental Web-Based Screening indicating the proposed development

The Environmental Screening Tool indicates that the Palaeontological Sensitivity of the proposed Paarde Valley PV2 Grid Connection to Vetlaagte MTS, near De Aar is Very High, High, Medium, and Low.



4 CONCLUSION

The Site Sensitivities of the proposed development has been verified and it was found that:

According to the SAHRIS Palaeosensitivity map (**Figure 4**) the proposed development is underlain by sediments of Very High (red), High (orange) and Moderate (green) and Zero (grey) Palaeontological Sensitivity.

.

And

The Environmental Screening Tool indicates that the Palaeontological Sensitivity of the proposed Paarde Valley PV2 Grid Connection to Vetlaagte MTS, near De Aar is Very High, High, Medium, and Low. This agrees with the SAHRIS Palaeosensitivity map.

Appendix C5: Ecology Specialist (Terrestrial Biodiversity, Animal Species and Plant Species)

Site Sensitivity Verification

prepared in accordance with the
*"Protocol for the Specialist Assessment and minimum report content
requirements for environmental impacts on Terrestrial Biodiversity"*

Paarde Valley PV2 to Vetlaagte MTS Grid Connection Project near
De Aar in Northern Cape Province



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Site Sensitivity Verification Report for the proposed Paarde Valley PV2 to Vetlaagte MTS Grid Connection Project near De Aar in Northern Cape Province

For: Paarde Valley PV2 (Pty) Ltd

5 July 2022

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SPECIALIST DETAILS & DECLARATION

This report has been prepared in accordance with the "Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial biodiversity", as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), published in GN. No. 320 dated 20 March 2020. It has been prepared independently of influence or prejudice by any parties.

The details of Specialists are as follows –

Table 1: Details of Specialist

Specialist	Qualification and accreditation
Dr David Hoare	PhD Pr.Sci.Nat. 400221/05 (Ecological Science, Botanical Science)

Details of Author:

Dr David Hoare

PhD (Botany) – Nelson Mandela Metropolitan University, Port Elizabeth

Main areas of specialisation

- Vegetation and general ecology (grasslands, savanna, Albany thicket, fynbos, coastal systems, wetlands).
- Plant biodiversity and threatened plant species specialist.
- Alien plant identification and control / management plans.
- Remote sensing, analysis and mapping of vegetation.
- Specialist consultant for environmental management projects.

Professional Natural Scientist, South African Council for Natural Scientific Professions, Reg. no. 400221/05 (Ecology, Botany)

Member, International Association of Vegetation Scientists (IAVS)

Member, Ecological Society of America (ESA)

Member, International Association for Impact Assessment (IAIA)

Member, Herpetological Association of Africa (HAA)

Employment history

- 1 December 2004 – present, Director, David Hoare Consulting (Pty) Ltd. Consultant, specialist consultant contracted to various companies and organisations.
- 1 January 2009 – 30 June 2009, Lecturer, University of Pretoria, Botany Dept.
- 1 January 2013 – 30 June 2013, Lecturer, University of Pretoria, Botany Dept.
- 1 February 1998 – 30 November 2004, Researcher, Agricultural Research Council, Range and Forage Institute, Private Bag X05, Lynn East, 0039. Duties: project management, general vegetation ecology, remote sensing image processing.

Declaration of independence:

David Hoare Consulting (Pty) Ltd in an independent consultant and hereby declare that it does not have any financial or other vested interest in the undertaking of the proposed activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act 107 of 1998). In addition, remuneration for services provided by David Hoare Consulting (Pty) Ltd is not subjected to or based on approval of the proposed project by the relevant authorities responsible for authorising this proposed project.

Disclosure:

David Hoare Consulting (Pty) Ltd undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) and will provide the competent authority with access to all information at its disposal regarding the application, whether such information is favourable to the applicant or not.

Based on information provided to David Hoare Consulting (Pty) Ltd by the client and in addition to information obtained during the course of this study, David Hoare Consulting (Pty) Ltd present the results and conclusion within the associated document to the best of the author's professional judgement and in accordance with best practise.



Dr David Hoare

5 July 2022

Date

TERMS OF REFERENCE

PROTOCOL FOR THE SPECIALIST ASSESSMENT AND MINIMUM REPORT CONTENT REQUIREMENTS FOR ENVIRONMENTAL IMPACTS ON PLANTS/ANIMALS/TERRESTRIAL BIODIVERSITY

This site sensitivity assessment follows the requirements of The Environmental Impact Assessment Regulations, as promulgated in terms of Section 24 (5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998), published in GN. No. 320 dated 20 March 2020. This states that prior to commencing with a specialist assessment, the current use of the land and the environmental sensitivity of the site under consideration identified by the national web based environmental screening tool must be confirmed.

1. The site sensitivity verification must be undertaken by an environmental assessment practitioner or a specialist.
2. The site sensitivity verification must be undertaken through the use of:
 - a. a desktop analysis, using satellite imagery;
 - b. a preliminary on-site inspection; and
 - c. any other available and relevant information.
3. The outcome of the site sensitivity verification must be recorded in the form of a report that:
 - a. confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;
 - b. contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity; and
 - c. is submitted together with the relevant assessment report prepared in accordance with the requirements of the Environmental Impact Assessment Regulations (EIA Regulations).

INTRODUCTION

Proposed project

Paarde Valley PV2 (Pty) Ltd (hereafter referred to as the Applicant) proposes the construction of a 132 kV, double circuit, overhead powerline (OHPL) grid connection from the authorised on-site substation and switching station at Paarde Valley PV2 to Vetlaagte Main Transmission Station (MTS) (which is currently undergoing its own EA application process). The OHPL is proposed to be approximately 12.7 km in length, and is located in the Strategic Transmission Central Corridor . A 200 m corridor (100 m of each side of the line) is assessed here. The final OHPL servitude will be registered as 31 m but during the design development process a corridor of 200 meters is required to allow for minor tower position adjustments. The exact pylon locations will be determined by the outcome of the specialist's investigations, and engineering considerations. On average there will be 4 - 5 towers per km, so that the route will consist of an approximately 40 towers. The teams constructing the OHPL often use cranes and these will fit into an area with a maximum radius of approximately 30 m around the base of each tower, with the final footprint being relatively small. The line will have a capacity of 132kV and will make use of either steel monopole or steel lattice structure in line with Eskom required specifications.

A monopole self-supporting structure has a maximum base of 5 m in diameter above the ground. In some situations the structures have stays. These would fall into the area with a maximum radius of 30 meters, but the stays themselves are hardly exposed at ground level, with only small steel rods protruding from the ground. Lattice towers have a bigger footprint as each has four legs that are a maximum of 15 m apart so that the final footprint would be approximately 15 m x 15 m. The height of either pylon structure will be up to 32 m.

The project will also include the switching station component of the authorised Paarde Valley PV2 on-site substation, with an approximate footprint area of 100 m x 100m, and a feeder bay at the Vetlaagte MTS with a capacity of 132 kV, as this needs to be handed over to Eskom with the grid connection self-build works once constructed.

In summary, the infrastructure associated with the proposed Grid Connection works for the Paarde Valley PV2 project (and to be handed back to Eskom following construction), includes the following:

- A 132kV, double circuit Overhead Power Line (OHPL) from the Switching Station connecting to the proposed Vetlaagte Main Transmission Substation (MTS)
- 132kV Feeder bay at the Vetlaagte MTS
- On-site Switching Station (SwS), adjacent to the authorised IPP 132 kV substation. (approximately 100 m x 100 m combined)

The technical details include:

Overhead Powerline:

- Height of pylons Up to 32m
- Type of poles/ pylons to be used. Double Circuit configuration. The alternatives under consideration and to be assessed include Steel lattice or Monopole structures in line with Eskom required specifications
- Transmission line capacity 132kV
- OHPL Service Road (to lie within the OHPL servitude)
 - Length of OHPL service road(s) – Twin tracked service road following line route
 - Width of OHPL service road(s) 6 m
- Switching Station:
 - Footprint of approximately 50 m – 100 m x 100 m adjacent to IPP Substation
 - Area occupied by buildings (Control building, relay room, generator, storage warehouse, water tanks, ablutions) +-1.0 Hectares

- Switching Station Access Road (separate access servitude from the nearest public road to the Switching Station yard)
 - Compacted gravel
 - Length of access road: +- 2.34 km
 - Width of access road: 8 m .
- Security fencing height: 2.4 m
- Type of fencing: Eskom palisade fencing + chainlink fencing for temporary works
- Capacity of on-site switching station 132kv

The OHPL and Switching station are required to connect the Paarde Valley PV2 Solar farm to the Eskom National Grid. The route selected follows boundary lines and / or existing OHPL routes so as to limit disruption to current farming activities as much as possible.

Site location and details

The proposed infrastructure is just to the north, north-east and east of the town of De Aar in the Northern Cape Province, within the quarter degree grid 3024CA (Figure 1).

The topography of the study site is gentle to flat. There is a non-perennial stream close to the Paarde Valley PV2 substation site, and the ground rises from there eastwards. The elevation on site varies from 1240 to 1336 m above sea level.

Most of the site consists of natural vegetation. The exception is a gravel road crossing the alignment corridor to the north of the Vetlaagte MTS, and a railway line very close to the Paarde Valley PV2.

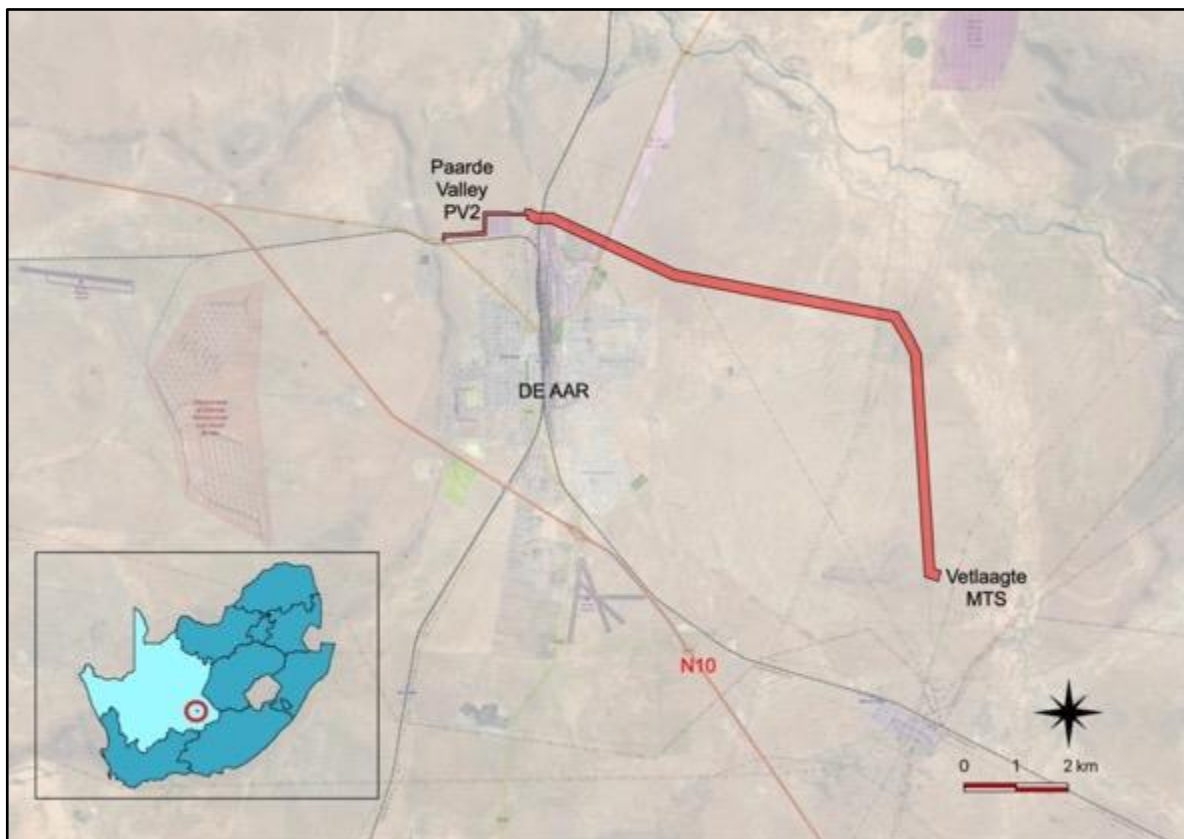


Figure 1: Location of the site adjacent to De Aar.

In accordance with GN 320 and GN 1150 (20 March 2020) of the NEMA EIA Regulations of 2014 (as amended), prior to commencing with a specialist assessment, a site sensitivity verification must be undertaken to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool (i.e., Screening Tool). David Hoare Consulting, as the Ecological specialist, have been commissioned to verify the sensitivity of the site under these specialist protocols.

The scope of this report is the 200 m corridor, the boundary of which is shown in Figure 2.

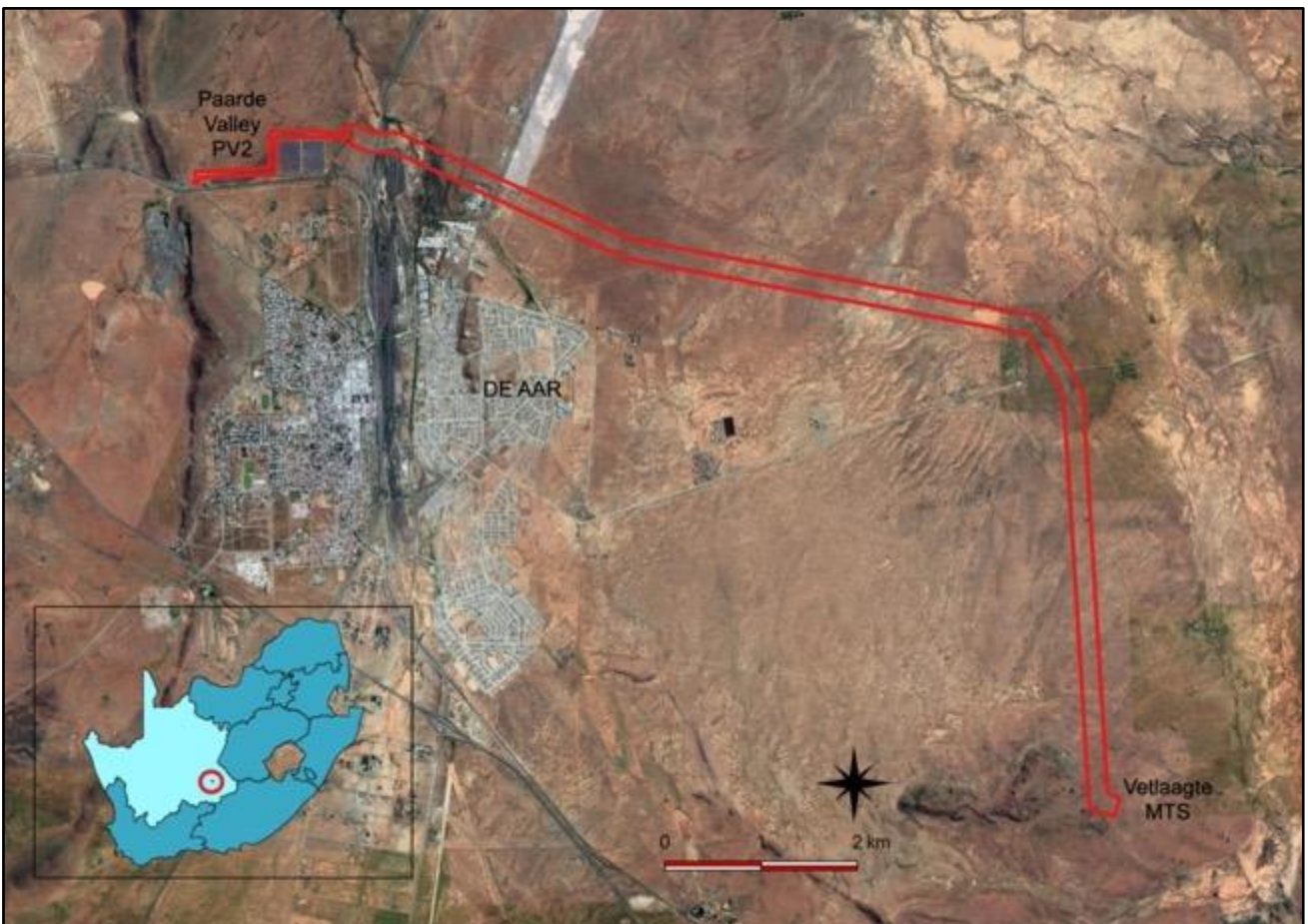


Figure 2: Aerial image of the corridor.

Identified Theme Sensitivities

A sensitivity screening report from the DEA Online Screening Tool was requested in the application category: Utilities Infrastructure | Electricity | Distribution and Transmission | Powerline. The DEA Screening Tool report for the area, dated 13/06/2022, indicates the following ecological sensitivities:

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Animal Species Theme		X		
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

Plant theme

Sensitivity features are indicated as follows:

Sensitivity	Feature(s)
Low	Low sensitivity
Medium	Hereroa concava
Medium	Tridentea virescens

Animal theme

Sensitivity features are indicated as follows:

Sensitivity	Feature(s)
High	Aves-Neotis ludwigii
High	Aves-Falco biarmicus
High	Aves-Aquila rapax
Low	Subject to confirmation
Medium	Aves-Aquila rapax
Medium	Aves-Neotis ludwigii

Terrestrial Biodiversity theme

Sensitivity features are indicated as follows:

Sensitivity	Feature(s)
Very High	Critical Biodiversity Area 2
Very High	Ecological support area
Very High	FEPA Subcatchments

SITE SENSITIVITY VERIFICATION METHODOLOGY

The detailed methodology followed as well as the sources of data and information used as part of this assessment is described below.

Survey timing

The study commenced as a desktop-study followed by a site-specific field study on 4 and 5 March 2022. The site is within the Nama-Karoo Biome. The climate is arid to semi-arid. Rainfall occurs from November to March, but peaks in mid- to late summer (February / March). Mean annual rainfall is 275 mm per year. There had been relatively good recent rainfalls prior to the field survey. The timing of the survey in early summer is therefore acceptable in terms of assessing the flora and vegetation of the site. The vegetation on site was in relatively good condition in terms of the seasonal presence of perennial plant species, although grass cover had not recovered from the previous winter period. The overall condition of the vegetation was therefore possible to be determined with a moderately high degree of confidence.

Field survey approach

Field surveys included both meander searches of general areas, and active searching in habitats that were considered to be suitable for specific groups or species. During the field survey, the entire corridor was assessed on foot. A hand-held Garmin GPSMap 64s was used to record a track within which observations were made. Digital photographs were taken of features and habitats on site, as well as of all plant and animal species that were seen. All plant and animal species recorded were uploaded to the iNaturalist website (<https://www.inaturalist.org>) and are accessible by viewing the observations for the site (use the Explore menu, zoom and pan until the desired study area is within the browser window, click the button "Redo search in map", and all observations for that area will be shown and listed).

Aerial imagery from Google Earth was used to identify and assess habitats on site. Patterns identified from satellite imagery were verified on the ground. Digital photographs were taken at locations where features of interest were observed. During the field survey, particular attention was paid to ensuring that all habitat variability was covered physically on the ground.

Digital photographs were taken of features of interest that were seen on site, as well as of habitat in different parts of the site.

Sources of information

Vegetation and plant species

- Broad vegetation types occurring on site were obtained from Mucina and Rutherford (2006), with updates according to the SANBI BGIS website (<http://bgis.sanbi.org>). The description of each vegetation type includes a list of plant species that may be expected to occur within the particular vegetation type.

- Plant species that could potentially occur on in the general area was extracted from the NewPosa database of the South African National biodiversity Institute (SANBI) for the quarter degree grid/s in which the site is located.
- The IUCN Red List Category for plant species, as well as supplementary information on habitats and distribution, was obtained from the SANBI Threatened Species Programme (Red List of South African Plants, <http://redlist.sanbi.org>).
- Lists were compiled specifically for any species at risk of extinction (Red List species) previously recorded in the area. Historical occurrences of threatened plant species were obtained from the South African National Biodiversity Institute (<http://posa.sanbi.org>) for the quarter degree square/s within which the study area is situated. Habitat information for each species was obtained from various published sources. The probability of finding any of these species was then assessed by comparing the habitat requirements with those habitats that were found, during the field survey of the site, to occur there.
- Regulations published for the National Forests Act (Act 84 of 1998) (NFA) as amended, provide a list of protected tree species for South Africa. The species on this list were assessed in order to determine which protected tree species have a geographical distribution that coincides with the study area and habitat requirements that may be met by available habitat in the study area. The distribution of species on this list were obtained from published sources (e.g. van Wyk & van Wyk 1997) and from the SANBI Biodiversity Information System website (<http://sibis.sanbi.org/>) for quarter degree grids in which species have been previously recorded. Species that have been recorded anywhere in proximity to the site (within 100 km), or where it is considered possible that they could occur there, were listed and were considered as being at risk of occurring there.

Fauna

- Lists of animal species that have a geographical range that includes the study area were obtained from literature sources (Bates et al., 2014 for reptiles, du Preez & Carruthers 2009 for frogs, Mills & Hes 1997 and Friedmann and Daly, 2004 for mammals). This was supplemented with information from the Animal Demography Unit website (adu.uct.ac.za) and literature searches for specific animals, where necessary.

Regional plans

- Information from the National Protected Areas Expansion Strategy (NPAES) was consulted for possible inclusion of the site into a protected area in future (available on <http://bgis.sanbi.org>).
- The Western Cape Biodiversity Conservation Plan maps were consulted for inclusion of the site into a Critical Biodiversity Area or Ecological Support Area (biodiversityadvisor.sanbi.org).

OUTCOME OF THE SITE SENSITIVITY VERIFICATION

Broad vegetation patterns

There is one regional vegetation type in the study area, namely Northern Upper Karoo (NKu3), which occurs throughout the site (Figure 3), briefly described below, including expected species composition.

Northern Upper Karoo

Distribution

Northern Cape and Free State Provinces: Northern regions of the Upper Karoo plateau from Prieska, Vosburg and Carnarvon in the west to Philipstown, Petrusville and Petrusburg in the east. Bordered in the north by Niekerkshoop, Douglas and Petrusburg and in the south by Carnarvon, Pampoenpoort and De Aar. A few patches occur in Griqualand West. Altitude varies mostly from 1 000–1 500 m.

Vegetation & Landscape Features

Shrubland dominated by dwarf karoo shrubs, grasses and *Senegalia mellifera* subsp. *detinens* and some other low trees (especially on sandy soils in the northern parts and vicinity of the Orange River).

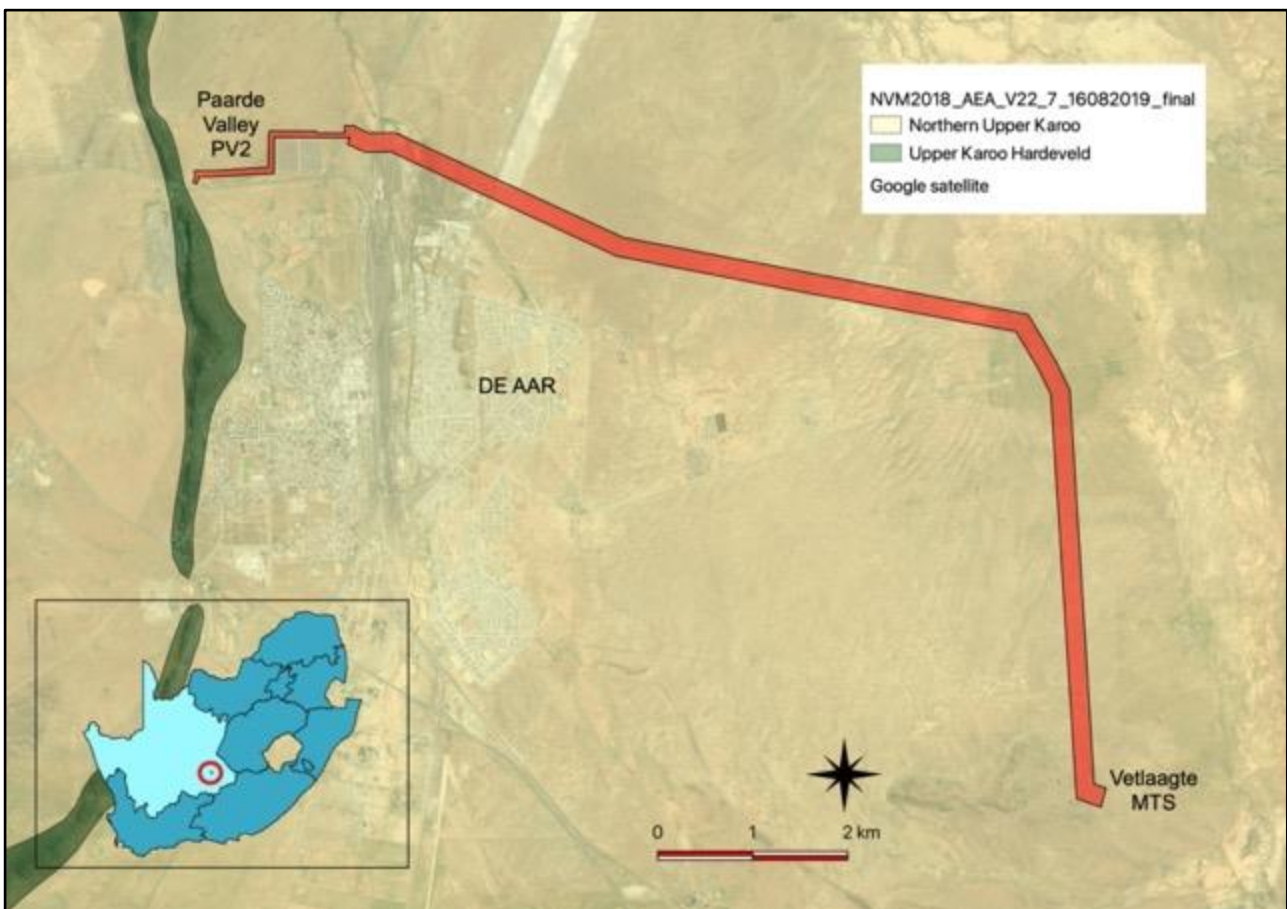


Figure 3: Regional vegetation types of the site and surrounding areas.

Flat to gently sloping, with isolated hills of Upper Karoo Hardeveld in the south and Vaalbos Rocky Shrubland in the northeast and with many interspersed pans.

Geology & Soils

Shales of the Volksrust Formation and to a lesser extent the Prince Albert Formation (both of the Ecca Group) as well as Dwyka Group diamictites form the underlying geology. Jurassic Karoo Dolerite sills and sheets support this vegetation complex in places. Wide stretches of land are covered by superficial deposits including calcretes of the Kalahari Group. Soils are variable from shallow to deep, red-yellow, apedal, freely drained soils to very shallow Glenrosa and Mispah forms. Mainly Ae, Ag and Fc land types.

Climate

Rainfall peaks in autumn (March). MAP ranges from about 190 mm in the west to 400 mm in the northeast. Mean maximum and minimum monthly temperatures for Britstown are 37.9°C and -3.6°C for January and July, respectively. Corresponding values are 37.1°C and -4.8°C for De Aar and 39.0°C and -2.3°C for Kareekloof (northwest of Strydenburg).

Important Taxa

Small Trees: *Senegalia mellifera* subsp. *detinens*, *Boscia albitrunca*.

Tall Shrubs: *Lycium cinereum* (d), *L. horridum*, *L. oxycarpum*, *L. schizocalyx*, *Rhigozum trichotomum*.

Low Shrubs: *Chrysocoma ciliata* (d), *Gnidia polycephala* (d), *Pentzia calcarea* (d), *P. globosa* (d), *P. incana* (d), *P. spinescens* (d), *Rosenia humilis* (d), *Amphiglossa triflora*, *Aptosimum marlothii*, *A. spinescens*, *Asparagus glaucus*, *Barleria rigida*, *Berkheya annectens*, *Eriocephalus ericoides* subsp. *ericoides*, *E. glandulosus*, *E. spinescens*, *Euryops asparagoides*. *Felicia muricata*, *Helichrysum lucilioides*, *Hermannia spinosa*, *Leucas capensis*, *Limeum aethiopicum*, *Melolobium candicans*, *Microloma armatum*, *Osteospermum leptolobum*, *O. spinescens*, *Pegolettia retrofracta*, *Pentzia lanata*, *Phyllanthus maderaspatensis*, *Plinthus karooicus*, *Pteronia glauca*, *P. sordida*, *Selago geniculata*, *S. saxatilis*, *Tetragonia arbuscula*, *Zygophyllum lichtensteinianum*.

Succulent Shrubs: *Hertia pallens*, *Salsola calluna*, *S. glabrescens*, *S. rabieana*, *S. tuberculata*, *Zygophyllum flexuosum*.

Semiparasitic Shrub: *Thesium hystrix* (d).

Herbs: *Chamaesyce inaequilatera*, *Convolvulus sagittatus*, *Dicoma capensis*, *Gazania krebsiana*, *Hermannia comosa*, *Indigofera alternans*, *Lessertia pauciflora*, *Radyera urens*, *Sesamum capense*, *Sutera pinnatifida*, *Tribulus terrestris*, *Vahlia capensis*.

Succulent Herb: *Psilocaulon coriarium*.

Geophytic Herb: *Moraea pallida*.

Graminoids: *Aristida adscensionis* (d), *A. congesta* (d), *A. diffusa* (d), *Enneapogon desvauxii* (d), *Eragrostis lehmanniana* (d), *E. obtusa* (d), *E. truncata* (d), *Sporobolus fimbriatus* (d), *Stipagrostis obtusa* (d), *Eragrostis bicolor*, *E. porosa*, *Fingerhuthia africana*, *Heteropogon contortus*, *Stipagrostis ciliata*, *Themeda triandra*, *Tragus berteronianus*, *T. koelerioides*, *T. racemosus*.

Biogeographically Important Taxa

Herb (western distribution limit): *Convolvulus boedeckerianus*.

Tall Shrub (southern limit of distribution): *Gymnosporia szyszyłowiczii* subsp. *namibiensis*.

Endemic Taxa

Succulent Shrubs: *Lithops hookeri*, *Stomatium pluridens*.

Low Shrubs: *Atriplex spongiosa*, *Galenia exigua*.

Herb: *Manulea deserticola*.

Vegetation conservation status

National status

The conservation status of Northern Upper Karoo is Least Concern. The vegetation type is not listed in The National List of Ecosystems that are Threatened and need of protection (GN1002 of 2011), published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004).

Table 2: Conservation status of vegetation types occurring in the study area, according to Mucina et al. 2005 and the National List of Ecosystems that are Threatened and need of protection (GN1002 of 2011).

Vegetation Type	Status (Mucina et al. 2005)	Status (NEMBA – 2011)	Status (NBA 2018)
Northern Upper Karoo	Least threatened	LC	LC

Biodiversity Conservation Plans

The Northern Cape CBA map classifies the natural vegetation of the province according to conservation value in decreasing value, as follows:

1. Protected
2. Critical Biodiversity Area One (Irreplaceable Areas) (RED)
3. Critical Biodiversity Area Two (Important Areas) (ORANGE)

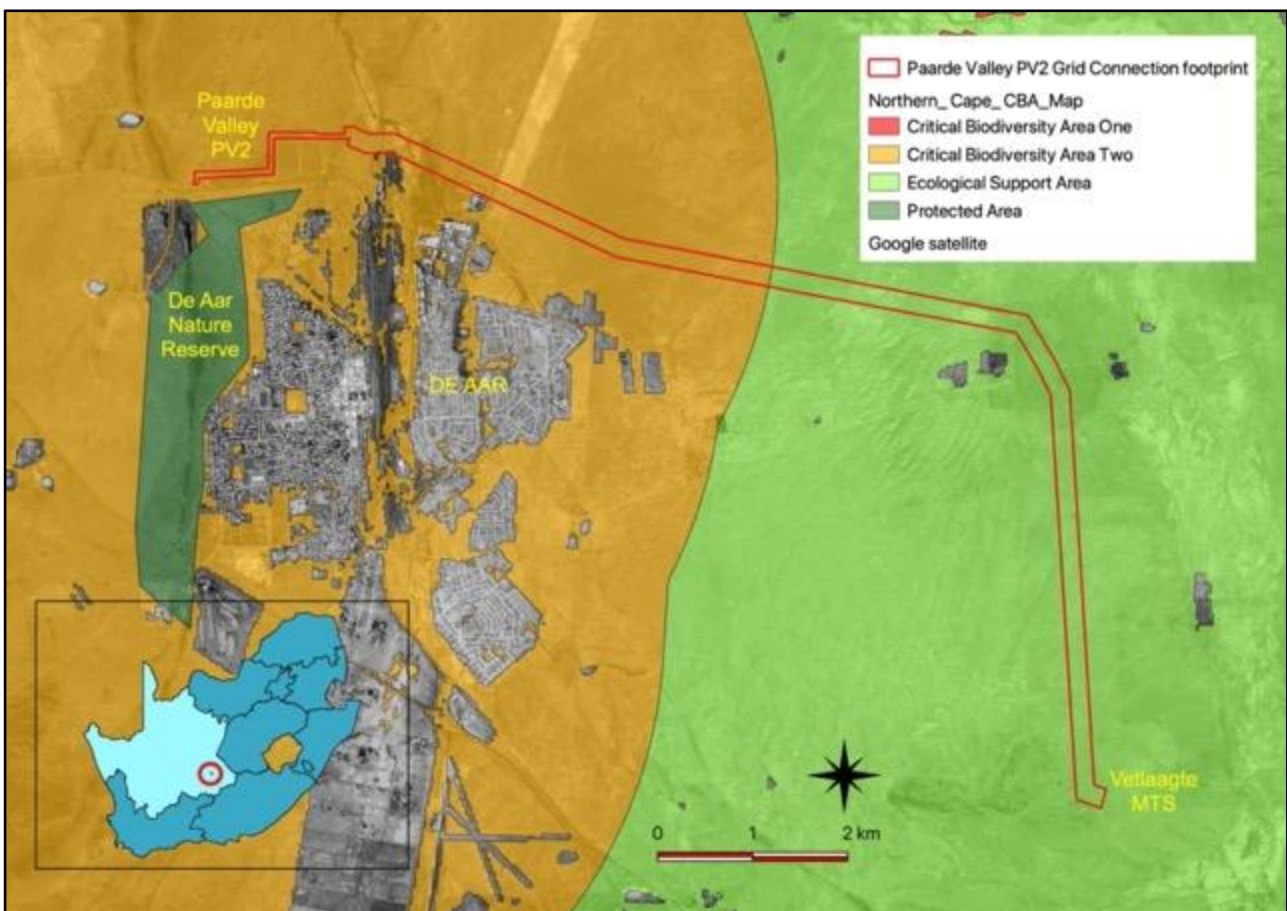


Figure 4: Northern Cape Biodiversity Conservation Plan for the site and surrounding areas.

4. Ecological Support Area (GREEN)
5. Other Natural Area (YELLOW)

This shows features within the study area within two of these classes, as follows (Figure 4):

1. Critical Biodiversity Area Two: north-eastern third of the corridor.
2. Ecological Support Areas: Remainder of the corridor, which corresponds with all remaining natural habitat.

There is a small protected area within 700 m of the project, called the De Aar Nature Reserve.

It is therefore verified that the site occurs within mapped Critical Biodiversity Area and Ecological Support Area. However, the characteristics of the on-site habitat determine whether vegetation consistent with a biodiversity conservation zone occurs on site or not – if there is no natural habitat then the sensitivity is LOW with respect to this attribute at those locations, or, if natural habitat occurs then those areas would have VERY HIGH sensitivity with respect to this attribute.

Habitats found on site

Plains

This is the widespread plains vegetation of the area around De Aar and occupies most of the area within the corridor (Figure 4). It is generally found on loamy soils with relatively low rock cover. The vegetation consists mostly of low dwarf shrubs, along with various grasses, especially after recent rainfall. It is relatively species poor, and is uniform across wide areas. There are some areas that are slightly raised relative to the general lowland plains, and have shallow rocky soils. They often occur on low rises, as well as forming a gradient to hills. The vegetation has many more dwarf shrubs and less grass than the lowland plains, and there is a higher species richness and more diverse local composition.

The vegetation consists mostly of low dwarf shrubs, such as *Pentzia incana*, *Chrysocoma ciliata*, *Aizoon africanum*, *Eriocephalus ericoides*, and *Ruschia intricata*, along with various grasses, including *Aristida congesta*, *Fingerhuthia africana*, *Eragrostis lehmanniana*, *Eragrostis obtusa*, *Chloris virgata*, *Stipagrostis uniplumis*, *Enneapogon cenchroides*, and *Cynodon dactylon*. It is relatively species poor, in terms of plant species, and is uniform across wide areas.

The plains support a variety of animal species, characteristically including the following mammals: *Raphicerus campestris* (Steenbok), *Antidorcas marsupialis* (Springbok), *Lepus saxatilis* (Scrub hare), *Lepus capensis* (Cape hare), *Geosciurus inauris* (Cape Ground Squirrel), *Suricata suricatta* (Suricate), *Cynictis penicillata* (Yellow mongoose), *Herpestes pulverulentus* (Cape grey mongoose), *Hystrix africaeaustralis* (Porcupine), *Cryptomys hottentotus* (Common mole rat), *Phacocoerus africanus*

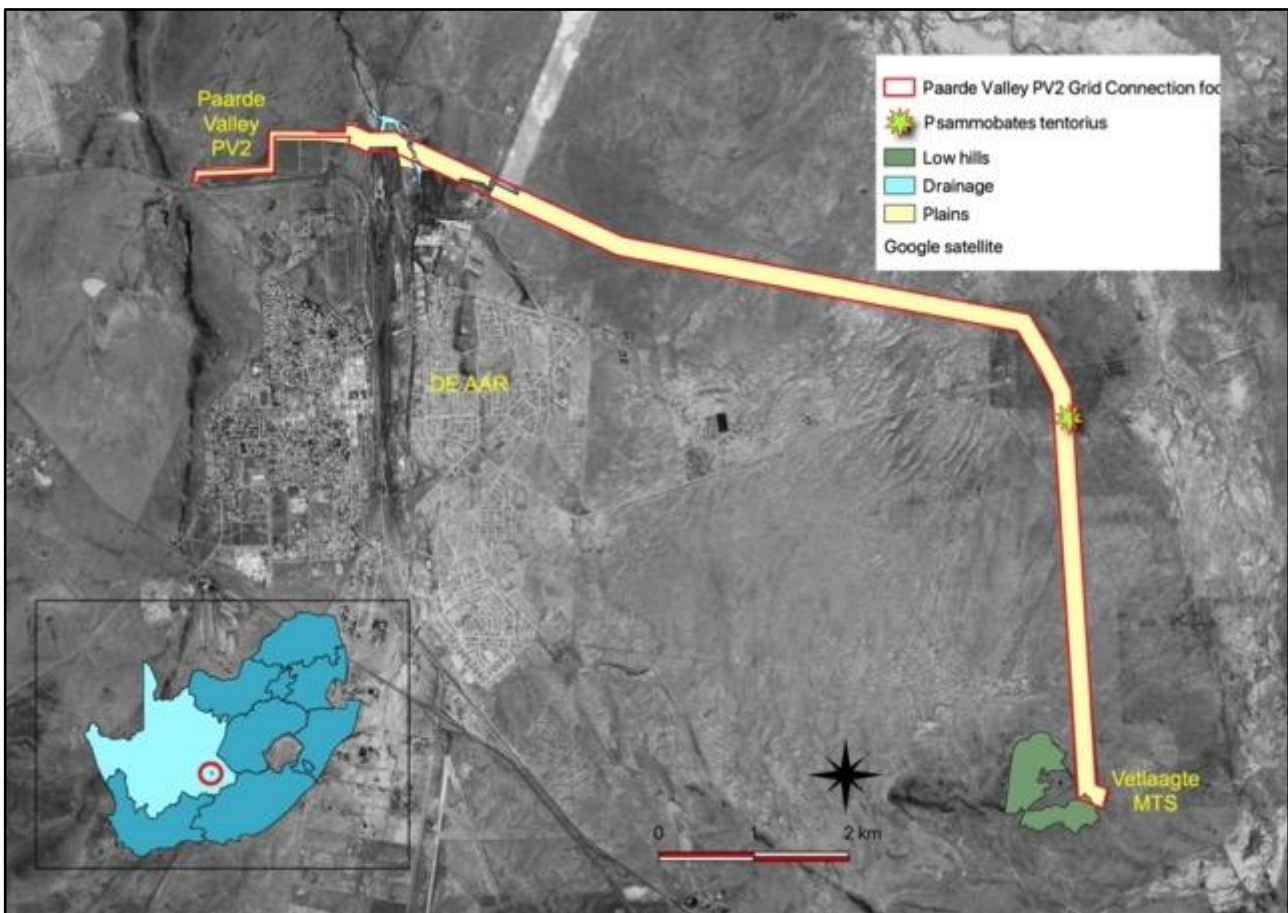


Figure 4: Habitats within the corridor.

(Common warthog), *Ictonyx striatus* (Striped polecat), *Proteles cristatus* (Aardwolf), *Oryctopus afer* (Aardvark), *Lupulella mesomelas* (Black-backed jackal), and *Caracal caracal* (Caracal), the following reptiles: *Stigmochelys pardalis* (Leopard tortoise), *Bitis arietens* (Puffadder), *Naja nivea* (Cape cobra), *Psammophylax rhombatus* (Rhombic skaapsteker), *Psammobates tentorius* (Karoo tent tortoise), *Pedioplanis namaquensis* (Namaqua sand lizard).

Low hills

There are a small number of low hills at the southern end of the study area (Figure 4) that have a steeper topography than the surrounding plains, are more rocky, and include various amounts of scattered rock and outcrops.

The vegetation is much more diverse than the surrounding plains and includes a higher diversity of woody shrubs, such as *Searsia burchellii*, *Diospyros austro-africanus*, *Boscia albitrunca* (PROTECTED TREE), *Asparagus glaucus*, and *Felicia filifolia*. The grass species composition is also different and includes *Heteropogon contortus*, *Themeda triandra*, and *Cenchrus ciliaris*.

Many of the species characteristic of the plains take refuge in the low hills, but there are also species most commonly found only in the hills, such as *Pronolagus saundersiae* (Hewitts red rock rabbit), *Atelerix frontalis* (Hedgehog), *Elephantulus rupestris* (Western rock elephant shrew), *Macroscelides proboscideus* (Round-eared elephant shrew), *Trachylepis sulcata* (Western rock skink), *Varanus albigularis* (Rock monitor)

Drainage

In the general De Aar area, the drainage areas include a variety of valley bottoms that are sometimes channelled and sometimes not, depending on the size. There is one of these that crosses the corridor near to the northern end (Figure 4). The margins generally grade into the surrounding karoo vegetation. The bottom is either bare soil or hollows that become waterlogged during rainfall. There are a number of built structures to hold back drainage, either for creating waterbodies or for erosion control. In places are well-defined channels in which recognisable wetland vegetation occurs. There are also local shallow depressions, as well as artificial waterholes, where wetland-like conditions exist.

Wetland vegetation is dominated by species such as *Afroscirpoides dioeca*, *Limosella major*, *Juncus rigidus*, *Eleocharis dregeana* and *Lobelia thermalis*. As is typical with wetland vegetation, there is often characteristic zonation driven by levels of water in the soils, sometimes resulting in localised areas dominated by a single species, and repetition of patterns in widely divergent areas.

These habitats are habitat for a number of animals, including the following amphibians: *Amietia poyntoni* (Poynton's river frog), *Breviceps adpersus* (Common rain frog), *Cacosternum boettgeri* (Common caco), *Poyntonophrynus vertebralis* (Southern pygmy toad), *Pyxicephalus adpersus* (African bullfrog), *Tomopterna tandyi* (Tandy's sand frog), and *Vandijkophrynus garipeensis* (Karoo toad). In addition, drainage areas are important migration corridors because they provide shrub vegetation cover and a low point in the landscape through which animals can move. They often also have soil moisture conditions that support vegetation growth even when surrounding plains are dry from drought conditions, which means that they provide a food supply when there is nothing else available in the landscape.



Figure 5: View of plains vegetation in central part of corridor.



Figure 6: View of corridor along northern part of site.



Figure 7: North-western end of corridor.



Figure 8: Hill with rock outcrops.



Figure 9: Vegetation within hills showing scattered rock piles.



Figure 10: Typical view of plains at southern end of corridor.

Red List plant species of the study area

There are two plant species flagged for the site in the DEA Online Screening Tool output, namely *Tridentea virescens* (Figure 11), listed as Rare, and *Hereroa concava*, listed as Vulnerable.

Tridentea virescens has a wide distribution over the drier parts of the Northern Cape and northern parts of the Eastern Cape (Bruyns 1994), as well as in southern Namibia (Figure 11). It occurs on stony ground, or on hard loam in floodplains. This habitat preference includes the entire section from the central bend to the Vetlaagte MTS. The species has been recorded twice previously near to De Aar and could possibly occur on site. However, it was not found, despite a careful search in suitable areas of habitat.

Due to taxonomic uncertainty, the distribution range of *Hereroa concava* is not well known. It appears to be endemic to a small area in the Great Karoo between Beaufort West, Richmond and De Aar. Plants occur sheltered among shrubs on flats and plateaus with shale outcrops. There are no known records from De Aar, although the site is within the overall geographical range known for the species. It was not found, despite a careful search in suitable areas of habitat.

There are no known additional listed species from further afield with a geographical distribution that may include the site.

There are therefore no threatened, near threatened or rare species that occur in the study area. It is therefore verified that the Plant Species Theme has LOW sensitivity.

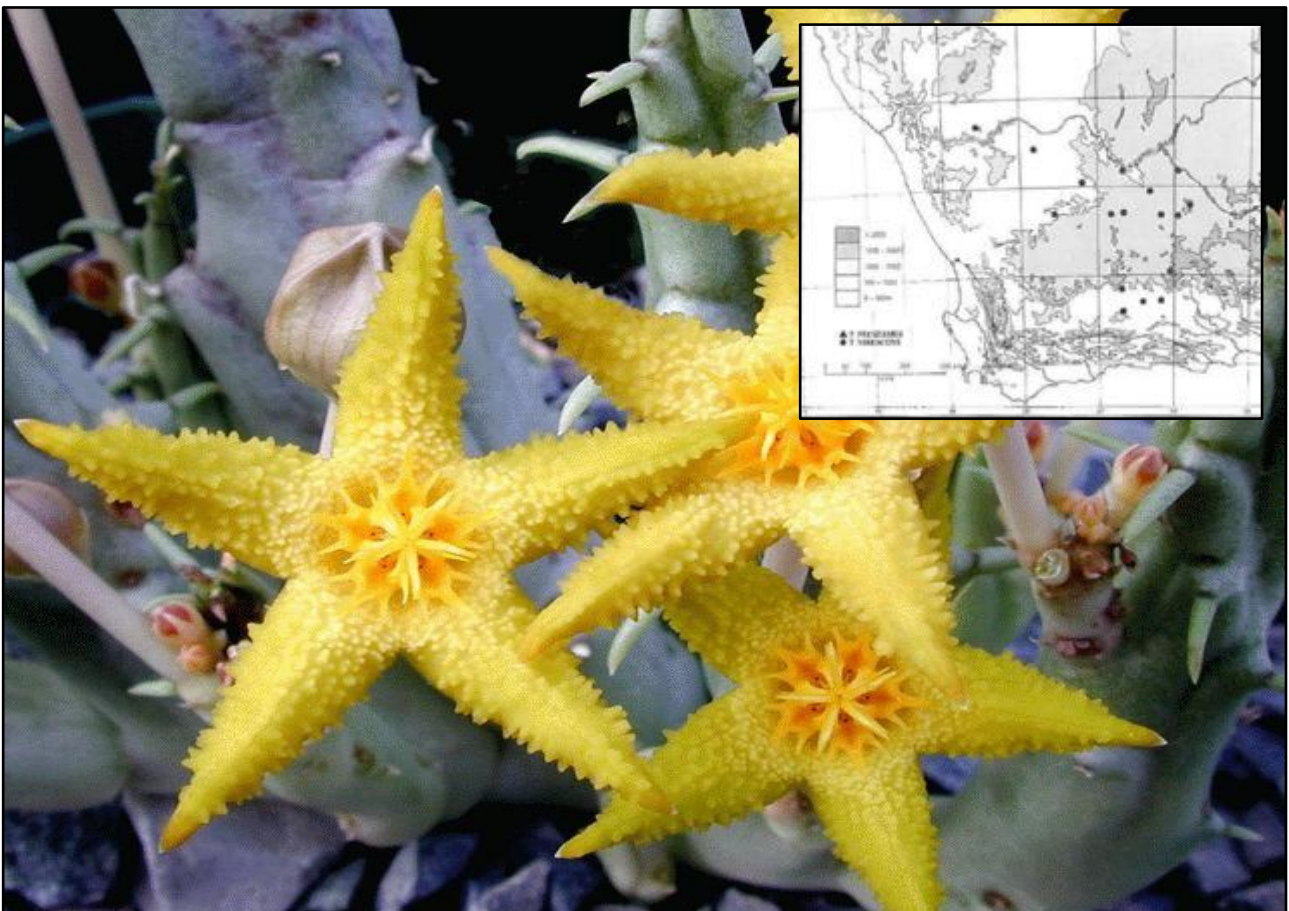


Figure 11: *Tridentea virescens* (picture from www.cactus-mall.com).

Protected trees

Tree species protected under the National Forest Act are listed in Appendix 2. There is one that has a geographical distribution that includes the study area, *Boscia albitrunca* (Shepherd's Tree / Witgatboom / !Xhi).

Boscia albitrunca occurs in semi-desert areas and bushveld, often on termitaria, but is common on sandy to loamy soils and calcrete soils. A number of individuals were found within the low hills at the southern end of the corridor, but outside of the assessed areas. This is close to the Vetlaagte MTS, but outside the footprint of the proposed infrastructure occurring in that area (proposed grid routes).

Red List animal species of the study area

Other than bird species, which are assessed in a separate specialist study, there are no animal species flagged for the site in the DEA Online Screening Tool output. A specialist avifaunal assessment forms a separate component of the environmental assessment application and birds in general are not discussed here.

One Near Threatened reptile species was found on site, the Tent Tortoise (*Psammobates tentorius*). The individual tortoise was found near the north-eastern end of the study area under the existing power line, within the proposed corridor for this BA process. This species has a wide distribution in South Africa from south-east of Graaff-Reinett to southern Namibia. The current observation is near to the north-eastern edge of the known distribution range. The main general threats to the species include primarily general habitat degradation and loss. The loss of habitat due to the proposed project will not have a significant impact on the overall availability of habitat for this species.

Other listed animal species that could possibly occur in the study area (based on geographical distribution) are mostly small carnivores, including Black-footed Cat (Vulnerable) and Brown Hyaena (Near Threatened), both mobile species that will move away from any human disturbance. Neither of these species has been recently observed anywhere nearby and it is considered unlikely that they occur there.

The sensitivity rating for the Animal Species Theme is for "SCC listed on the IUCN Red List of Threatened Species or South Africa's National Red List website as Critically Endangered, Endangered or Vulnerable according the IUCN Red List 3.1. Categories and Criteria and under the national category of Rare."

It is therefore verified that the Animal Species Theme (excluding the taxon Aves) has LOW sensitivity.

CONCLUSIONS

Desktop information, field data collection and mapping from aerial imagery provides the following verifications of patterns provided in the DEA Online Screening Tool for various themes:

1. Almost the entire corridor, as well as both substation sites, consists of natural vegetation.
2. Most of the study area occurs within Critical Biodiversity Area 2 or Ecological Support Area in the Northern Cape CBA map. Therefore the site has VERY HIGH sensitivity for this component of the Terrestrial Biodiversity Theme. A Terrestrial Biodiversity Specialist Assessment is therefore required.
3. There are no plant species of concern that are likely to occur on site and none were seen on site. This verifies the LOW sensitivity for the Plant Species Theme. A Plant Species Compliance Statement is therefore required.
4. The site has no habitat that is suitable for any of the flagged animal species (excluding the taxon Aves) and none of these species are likely to occur there. This verifies the LOW sensitivity for the Animal Species Theme (excluding the taxon Aves). An Animal Species Compliance Statement is therefore required.

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APPENDICES:

Appendix 1: Plant species recorded on site and nearby.

Species	Category
<i>Afroscirpodes dioeca</i>	
<i>Agave americana</i>	Category
<i>Aizoon africanum</i>	
<i>Aizoon canariense</i>	
<i>Aizoon plinthoides</i>	
<i>Albuca</i> sp.	
<i>Aloe broomii</i>	
<i>Aptosimum marlothii</i>	
<i>Argemone ochroleuca</i>	Category 1b
<i>Aristida adscensionis</i>	
<i>Aristida congesta</i> subsp. <i>congesta</i>	
<i>Asparagus glaucus</i>	
<i>Asparagus striatus</i>	
<i>Asplenium cordatum</i>	
<i>Berkheya pinnatifida</i>	
<i>Berkheya spinosissima</i>	
<i>Boscia albitrunca</i>	PROTECTED
<i>Bulbine frutescens</i>	
<i>Cadaba aphylla</i>	
<i>Cenchrus ciliaris</i>	
<i>Chelanthes eckloniana</i>	
<i>Chloris virgata</i>	
<i>Chrysocoma ciliata</i>	
<i>Coccinia sessilifolia</i>	
<i>Cucumis africanus</i>	
<i>Cynodon dactylon</i>	
<i>Cynodon incompletus</i>	
<i>Cyperus usitatus</i>	
<i>Datura ferox</i> *	Category 1b
<i>Diospyros austro-africana</i>	
<i>Dipcade crispum</i>	
<i>Eleocharis dregeana</i>	
<i>Enneapogon cenchroides</i>	
<i>Enneapogon desvauxii</i>	
<i>Eragrostis bergiana</i>	
<i>Eragrostis bicolor</i>	
<i>Eragrostis curvula</i>	
<i>Eragrostis homomalla</i>	
<i>Eragrostis lehmanniana</i>	
<i>Eragrostis obtusa</i>	
<i>Eriocephalus africanus</i>	
<i>Eriocephalus ericoides</i>	
<i>Felicia filifolia</i>	
<i>Fingerhuthia africana</i>	
<i>Gazania jurineifolia</i>	
<i>Gazania krebsiana</i>	
<i>Gomphocarpus fruticosus</i>	

Helichrysum sp.	
Heliophila minima	
Hermannia althaeifolia	
Hermannia coccocarpa	
Heteropogon contortus	
Hibiscus trionum	
Indigofera alternans	
Jamesbrittenia sp.	
Juncus rigidus	
Kohautia amatymbica	
Lasiosiphon polycephalus	
Ledebouria apertiflora	
Limosella major	
Lobelia thermalis	
Lycium cinereum	
Lycium horridum	
Mesembryanthemum coriarium	
Mesembryanthemum junceum	
Mestoklema tuberosum	
Monsonia salminiflora	
Opuntia engelmannii	Category 1b
Opuntia robusta*	Category 1b
Osteospermum scariosum	
Osteospermum spinescens	
Panicum impeditum	
Peliostomum leucorrhizum	
Pentzia incana	
Pentzia sphaerocephala	
Phragmites australis	
Phymaspermum parvifolium	
<i>Polygala ephedroides</i>	
Prosopis glandulosa	Category 1b
Ruschia intricata	
Scabiosa columbaria	
Schoenoplectus muricinux	
Searsia burchellii	
Selago sp.	
Solanum elaeagnifolium	Category 1b
Solanum sp.	
Stipagrostis obtusa	
Stipagrostis uniplumis	
Themeda triandra	
Tragus berteronianus	
Tragus koelerioides	
Tribulus terrestris	
Zygophyllum sp.	

Appendix 2: Checklist of animal species found on site or nearby (within 20 km).

Species	Category
REPTILES:	
<i>Acontias gracilicauda</i> (Thin-tailed Legless Skink)	
<i>Acontias occidentalis</i> (Okahandja Legless Skink)	
<i>Agama aculeata</i> (Ground Agama)	
<i>Bitis arietans</i> (Puffadder)	
<i>Chondrodactylus bibronii</i> (Bibron's Thick-toed Gecko)	
<i>Duberria lutrix</i> (Common Slug Eater)	
<i>Homopus femoralis</i> (Greater Padloper)	
<i>Karusasaurus polyzonus</i> (Karoo Girdled Lizard)	
<i>Lamprophis aurora</i> (Aurora House Snake)	
<i>Naja nivea</i> (Cape Cobra)	
<i>Nucras holubi</i> (Holub's Sandveld Lizard)	
<i>Pedioplanis namaquensis</i> (Namaqua Sand Lizard)	
<i>Psammobates tentorius</i> (Tent Tortoise)	NEAR THREATENED
<i>Psammophis leightoni</i> (Cape Sand Snake)	
<i>Psammophylax rhombeatus</i> (Rhombic Skaapsteker)	
<i>Stigmochelys pardalis</i> (Leopard Tortoise)	
<i>Trachylepis sulcata</i> (Western Rock Skink)	
<i>Varanus albigularis</i> (Rock Monitor)	
MAMMALS	
<i>Antidorcus marsupialis</i> (Springbok)	
<i>Atelerix frontalis</i> (Hedgehog)	PROTECTED
<i>Caracal caracal</i> (Caracal)	
<i>Connochaetes gnou</i> (Black Wildebeest)	
<i>Connochaetes taurinus</i> (Common Wildebeest)	
<i>Cryptomys hottentotus</i> (Common mole rat)	
<i>Cynictis penicillata</i> (Yellow Mongoose)	
<i>Elephantulus rupestris</i> (Western Rock Sengi)	
<i>Felis lybica</i> (African Wild Cat)	
<i>Felis nigripes</i> (Black-footed Cat)	VULNERABLE, PROTECTED
<i>Geosciurus inauris</i> (Cape Ground Squirrel)	
<i>Herpestes pulverulentus</i> (Cape Grey Mongoose)	
<i>Hippotragus niger</i> (Sable Antelope)	
<i>Hystrix africaeaustralis</i> (Porcupine)	
<i>Ictonyx striatus</i> (Striped Polecat)	
<i>Lepus capensis</i> (Cape Hare)	
<i>Lepus saxatilis</i> (Scrub Hare)	
<i>Lupulella mesomelas</i> (Black-backed Jackal)	
<i>Macroselides proboscideus</i> (Karoo Round-eared Sengi)	
<i>Mystromys albicaudatus</i> (White-tailed Rat)	VULNERABLE
<i>Orycteropus afer</i> (Aardvark)	
<i>Phacochoerus africanus</i> (Common Warthog)	
<i>Procavia capensis</i> (Dassie)	
<i>Pronolagus saundersiae</i> (Southern Red Rockrabbit)	
<i>Proteles cristatus</i> (Aardwolf)	
<i>Raphicerus campestris</i> (Steenbok)	
<i>Redunca fulvorufula</i> (Mountain Reedbuck)	ENDANGERED
<i>Suricata suricatta</i> (Meerkat)	
<i>Vulpes chama</i> (Cape Fox)	PROTECTED

AMPHIBIANS	
<i>Amietia poyntoni</i> (Poynton's River Frog)	
<i>Breviceps adspersus</i> (Common Rain Frog)	
<i>Cacosternum boettgeri</i> (Boettger's Dainty Frog)	
<i>Tomopterna tandyi</i> (Tandy's Sand Frog)	
<i>Poyntonophrynus vertebralis</i> (Pygmy Toad)	
<i>Pyxicephalus adspersus</i> (African Giant Bullfrog)	PROTECTED
<i>Vandijkophrynus gariepensis</i> (Karoo Toad)	
INVERTEBRATES	
<i>Locustana pardalina</i>	
<i>Acanthopplus</i> sp.	
<i>Hycleus burmeisteri</i>	
Subfamily Coenosiinae	
Tribe Tylopsidini	
<i>Scarabeus</i> sp.	
Subfamily Asilinae	
<i>Orthetrum caffrum</i>	
<i>Zonocerus elegans</i>	
Family Lycosidae	
Genus <i>Argiope</i>	
<i>Vanessa cardui</i>	

Appendix C6: Aquatic Biodiversity Specialist

Appendix C: Site Sensitivity Verification

Prior to commencing with the Aquatic Biodiversity Specialist Assessment in accordance with the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Aquatic Biodiversity (Government Notice 320, dated 20 March 2020), a site sensitivity verification was undertaken to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool (Screening Tool).

The details of the site sensitivity verification are noted below:

Date of Site Visit	3 and 4 March 2022
Specialist Name	Toni Belcher
Professional Registration Number	400040/10
Specialist Affiliation / Company	-

The proposed site for the **Paarde Valley PV2 Grid Connection** near De Aar in the Northern Cape Province, was assessed in terms of its aquatic biodiversity sensitivity using a desktop analysis using available aquatic ecosystem mapping, aerial imagery and a site visit, undertaken on 3 and 4 March 2022. A literature survey was also undertaken to determine any aquatic biodiversity sensitivities that may occur in the surrounding area.

The field visit comprised of delineation, characterisation and integrity assessments of the aquatic habitats within the site. Mapping of the freshwater features was undertaken using a GPS Tracker and mapped in PlanetGIS and Google Earth Professional.

The following techniques and methodologies were utilised to undertake the assessments:

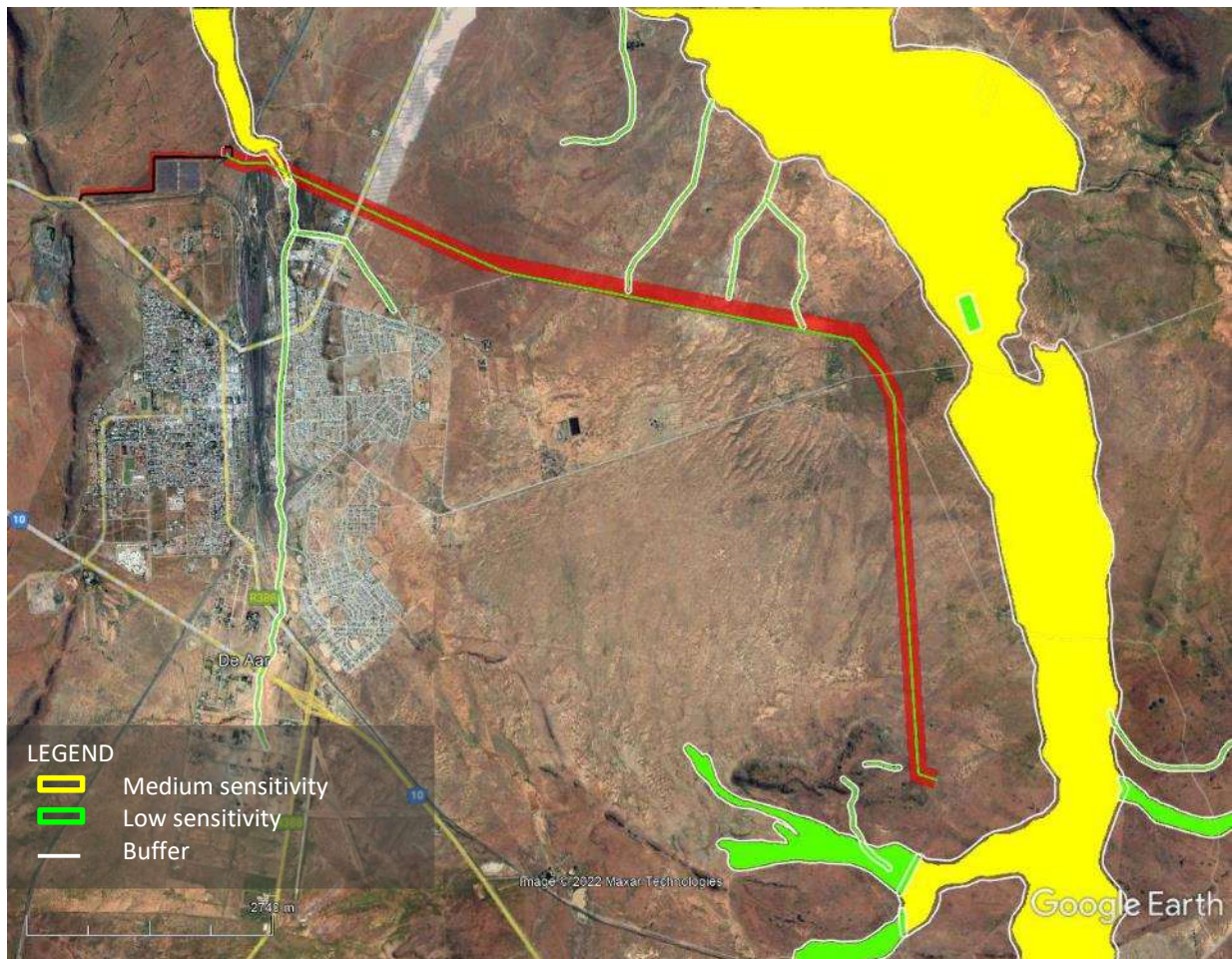
- The guideline document, "A Practical Field Procedure for the Identification and Delineation of Wetlands and Riparian Areas" document, as published by DWAF (2005), was followed for the delineation of the aquatic habitats;
- The present ecological condition of the watercourses was determined using the national River Health Programme and Wet-Health methodologies;
- The ecological importance and ecological sensitivity (EI&ES) assessment of the watercourses were conducted according to the guidelines as developed by DWAF (1999); and
- Recommendations are made concerning the adoption of buffer zones within the site were based on watercourse functioning and site characteristics as well as the DWS buffer tool.

The aquatic features within the wider study area comprise ephemeral unnamed tributaries of the Brak River. The river flows approximately 3 km to the north of the study area with a larger tributary crossing the eastern extent of the study area. A second, smaller tributary of the Brak River is the Sandsloot River which flows through the town of De Aar and transects the Paarde Valley farm. Several smaller ephemeral watercourses and drainage lines drain into these larger river corridors from the surrounding higher lying areas. Associated with the larger watercourses are wider floodplains wetlands. Small, shallow instream dams have been constructed within these watercourses in the area that tends to be dominated by *Typha capensis* bulrush or *Phragmites australis* reeds. There are also artificial wetland areas on the northeastern portion of the Paarde Valley farm as a result of the overflow from the De Aar Wastewater Treatment Works.

The Brak River, its larger tributaries and the associated floodplain through the area are deemed to be of moderate aquatic ecological sensitivity, while the smaller watercourses and drainage lines are considered to be of low sensitivity.

The Screening Tool has indicated that the catchment of the Brak River Tributary at the site is mapped as being of very high Aquatic Biodiversity Combined Sensitivity. The very high sensitivity is linked to the Strategic

Water Source Area for groundwater that has been identified in the wider area as well as the larger Brak River FEPA Sub-catchment. The proposed activities are however unlikely to impact the SWSA or the ecological integrity of the FEPA River.



Google Earth image with the Aquatic Ecosystem Sensitivity mapping where the green area indicates low sensitivity and the yellow the moderate sensitivity areas. The white lines indicate the recommended buffers.

Appendix C7: Avian Specialist

APPENDIX 3: SITE SENSITIVITY VERIFICATION

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1. INTRODUCTION

Environmental Authorisation (EA) for 150MW Paarde Valley PV2 was granted by the Department of Forestry, Fisheries and the Environment (DFFE) on 7 September 2012. The authorised project includes the construction of a PV solar energy facility (SEF) to generate approximately 75–150MW, as well as 132kV/220kV overhead transmission lines and associated infrastructure (access roads, water supply infrastructure, stormwater infrastructure, internal access roads, buildings and fencing).

The currently authorised 132kV/220kV grid connection for Paarde Valley PV2 is routed from the Paarde Valley PV2 facility to the De Aar substation. However, due to grid capacity constraints in the Northern Cape, the Paarde Valley PV2 cannot connect to the De Aar substation. As a result, Paarde Valley PV2 (Pty) Ltd wishes to amend the authorised grid connection (realignment and termination point) and create a separate EA for the construction of the 132kV double circuit overhead powerline (OHPL) grid connection from the authorised on-site substation and switching station (SwS) at Paarde Valley PV2 to Vetlaagte Main Transmission Station (MTS), which is currently undergoing its own EA application process. The proposed OHPL is approximately 12.7km in length, located within the Strategic Transmission Central Corridor, following boundary lines and/or existing powerline alignments so as to limit disruption to current farming activities as much as possible. The project also includes the 132kV SwS component of the authorised Paarde Valley PV2 on-site substation, with an approximate footprint area of 100 m x 100m, a feeder bay at the Vetlaagte MTS and an 8m wide SwS gravel access road, approximately 2.34km in length. The Paarde Valley PV2 grid connection is located within 10km of De Aar, in the Pixley Ka Seme District Municipality in the Northern Cape Province of South Africa (Figure 1).

In terms of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) Environmental Impact Assessment (EIA) Regulations [4 December 2014, Government Notice (GN) R982, R983, R984 and R985, as amended], various aspects of the proposed developments may have an impact on the environment and are considered to be listed activities. These activities require authorisation from the National Competent Authority (CA), namely the Department of Forestry, Fisheries and the Environment (DFFE), prior to the commencement thereof. In accordance with GN 320 and GN 1150 (20 March 2020)³ of the NEMA EIA Regulations of 2014 (as amended), prior to commencing with a specialist assessment, a site sensitivity verification must be undertaken to confirm the current land use and environmental sensitivity of the proposed project areas as identified by the National Web-Based Environmental Screening Tool (i.e., Screening Tool). Chris van Rooyen, in association with Albert Froneman, as avifaunal specialists, have been commissioned to verify the sensitivity of the project sites under these specialist protocols. The scope of this report is for the proposed development.

³ GN 320 (20 March 2020): Procedures for The Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act, 1998, when applying for Environmental Authorisation

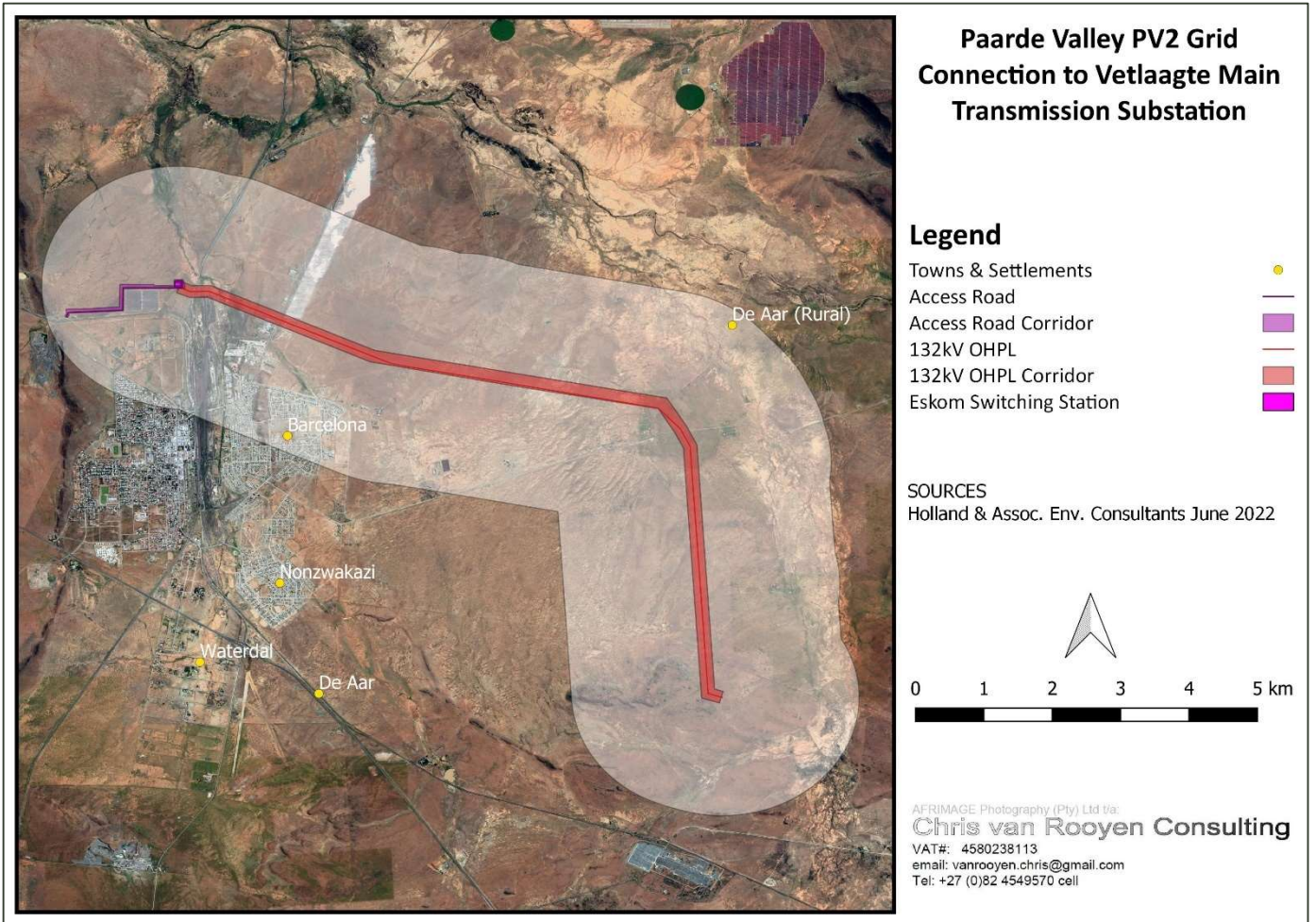


Figure 1: Locality map indicating the location of the proposed development within the study area near De Aar, Northern Cape Province.

2. SITE SENSITIVITY VERIFICATION METHODOLOGY

The following information sources were consulted to compile this report:

- Bird distribution data from the Southern African Bird Atlas Project 2 (SABAP2) was obtained (<http://sabap2.adu.org.za/>), in order to ascertain which species occur in the pentads where the proposed development is located. A pentad grid cell covers 5 minutes of latitude by 5 minutes of longitude (5' × 5'). Each pentad is approximately 8 × 7.6 km. To get a more representative impression of the birdlife, a consolidated data set was obtained for a total of six pentads some of which intersect and others that are near the study area. The decision to include multiple pentads around the study area was influenced by the fact that the pentads within which the proposed development is located have few completed full protocol surveys. The additional pentads and their data augment the bird distribution data. The six pentad grid cells are the following: 3035_2355, 3035_2400, 3035_2405, 3040_2355, 3040_2400 and 3040_2405 (Figure 2). A total of 28 full protocol lists (i.e. bird listing surveys lasting a minimum of two hours each) and 41 ad hoc protocol lists (surveys lasting less than two hours but still yielding valuable data) have been completed to date for the six pentads within which the study area is located. The SABAP2 data is regarded as a reliable reflection of the avifauna which occurs in the area and is supplemented with data collected during the site visit and extensive general knowledge of the area.
- A classification of the vegetation types in the study area was obtained from the Atlas of Southern African Birds 1 (SABAP1) and the National Vegetation Map compiled by the South African National Biodiversity Institute (Mucina & Rutherford 2006).
- The national threatened status of all priority species was determined with the use of the most recent edition of the Red Data Book of Birds of South Africa, Lesotho and Swaziland (Taylor et al. 2015), and the latest authoritative summary of southern African bird biology (Hockey et al. 2005).

- The global threatened status of all priority species was determined by consulting the latest (2021.3) IUCN Red List of Threatened Species (<http://www.iucnredlist.org/>).
- The Important Bird and Biodiversity Areas of South Africa (Marnewick *et al.* 2015; <http://www.birdlife.org.za/conservation/important-bird-areas>) was consulted for information on potentially relevant Important Bird Areas (IBAs).
- Satellite imagery (Google Earth © 2022) was used in order to view the broader area on a landscape level and to help identify bird habitat on the ground.
- The South African National Biodiversity BGIS map viewer was used to determine the locality of the study area relative to National Protected Areas, National Protected Areas Expansion Strategy (NPEAS) focus areas and Critical Biodiversity Areas in the Northern Cape Province .
- The DFFE National Screening Tool was used to determine the assigned avian sensitivity of the study area (February, 2022).
- Procedures for the Assessment and Minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of NEMA when applying for Environmental Authorisation (Gazetted October 2020)
- Guidelines for the Implementation of the Terrestrial Flora (3c) & Terrestrial Fauna (3d) Species Protocols for EIAs in South Africa produced by the South African National Biodiversity Institute on behalf of the Department of Environment, Forestry and Fisheries (2020).
- Primary avifaunal diversity and abundance data collected during a single season, one-day site visit conducted on 28 March 2022. Data was collected by means of incidental counts.

3. OUTCOME OF SITE SENSITIVITY VERIFICATION

The project site and immediate environment is classified as **MEDIUM and HIGH** sensitivity for terrestrial animals according to the Terrestrial Animal Species Theme (Figure 2). These classifications are linked to the potential occurrence of Ludwig’s Bustard *Neotis ludwigii* (Globally and Regionally Endangered) and Verreaux’s Eagle *Aquila verreauxii* (Regionally Vulnerable). The study area contains confirmed habitat for species of conservation concern (SCC) as defined in the Protocol for the specialist assessment and minimum report content requirements for environmental impacts on terrestrial animal species (Government Gazette No 43855, 30 October 2020, namely listed on the IUCN Red List of Threatened Species or South Africa’s National Red List website as Critically Endangered, Endangered or Vulnerable.

4. CONCLUSION

Although the occurrence of the SCC could not be confirmed during the site visit to the study area, the authors have conducted several assessments and research projects in broader area and have previously observed both Ludwig’s Bustard and Verreaux’s Eagle in identical habitats in the broader area, in addition to Martial Eagle *Polemaetus bellicosus* and Tawny Eagle *Aquila rapax*. Based on these observations, the classification of **HIGH** sensitivity for avifauna in the screening tool is therefore confirmed.

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY

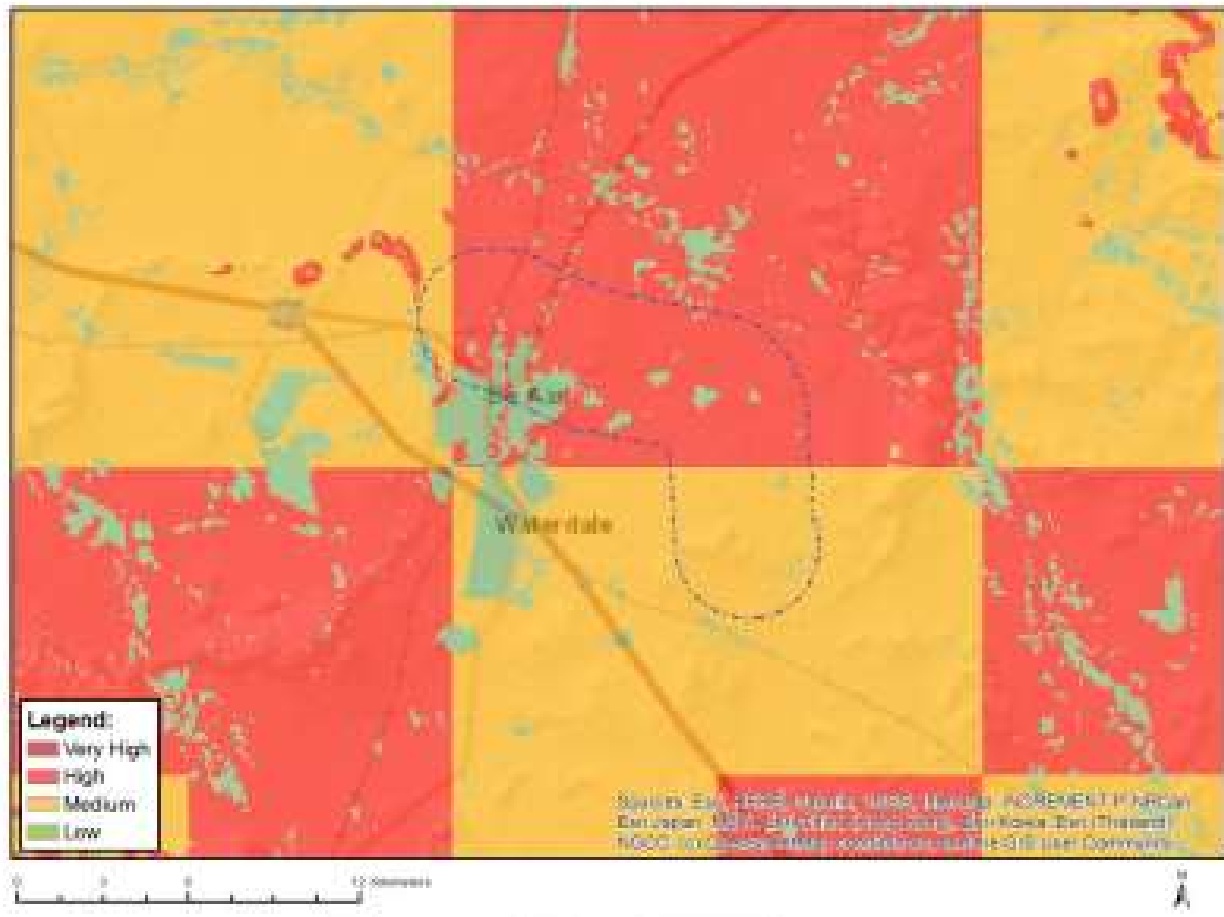


Figure 2: the classification of the study area in the DFFE online screening tool.

Appendix C8: Comment from the Civil Aviation Authority





From: Lizell Stroh <StrohL@caa.co.za>
Sent: 11 May 2022 14:45
To: anja@hollandandassociates.net
Cc: Adelle Odendaal; Evelyn Shogole; Doris Khoza; Simphiwe Masilela
Subject: RE: Request for comment: Paarde Valley PV2 Grid Connection
Attachments: CAA_2021_11_332.pdf; Revised CAA_2021_11_332 Letter.pdf; FW: Paarde Valley PV 2 Solar Energy Facility Powerlines - CAA Assessments (6.97 MB)

Good day Anja, the respected approval was Granted towards the Developer.

Could you kindly confirm that this would be the approval Relevant to the project enquired.

Kind regards



Lizell Stroh
Obstacle Inspector
Aerodrome Infrastructure
Aviation Infrastructure
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Email: StrohL@caa.co.za | www.caa.co.za
Foll us on    



“We spend most of our waking lives at work, so it's important that we do what we love and love what we do.”

Richard Branson

From: Canny Mosebjadi Mothapo <MothapoC@caa.co.za>
Sent: Wednesday, 11 May 2022 12:48
To: Lizell Stroh <StrohL@caa.co.za>; Doris Khoza <KhozaD@caa.co.za>; Simphiwe Masilela <Masilelas@caa.co.za>
Cc: Adelle Odendaal <OdendaalA@caa.co.za>; Evelyn Shogole <ShogoleE@caa.co.za>
Subject: FW: Request for comment: Paarde Valley PV2 Grid Connection

From: anja@hollandandassociates.net <anja@hollandandassociates.net>
Sent: Wednesday, 11 May 2022 11:46
To: Obstacles <Obstacles@caa.co.za>
Cc: Lizell Stroh <StrohL@caa.co.za>; 'Nicole Holland' <nicole@hollandandassociates.net>;

tilly@hollandandassociates.net

Subject: Request for comment: Paarde Valley PV2 Grid Connection

Good day,

I trust this e-mail finds you well.

I have attached a letter regarding a request for comment by the CAA on the Paarde Valley PV2 132 kV grid connection application. I have also attached a shapefile of the proposed project.

Kindly confirm receipt of this e-mail and advise if you require any further information in order to provide comment on the above-mentioned project?

I look forward to hearing from you!

Kind regards,

Anja Albertyn (MSc, Pr. Sci. Nat.)

Holland & Associates
Environmental Consultants



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Fax Number: +27 21 934 1326

Paarde Valley PV 2 (Pty) Ltd

Top Floor- Golf Park 4- Raapenberg Road- Mowbray
Cape Town
Western Cape
7700

Enquiries: L Stroh

Tel. 011 545 1232

strohl@caa.co.za

Ref. CA8/2/De Aar

CAA_2021_11_332

09 March 2022

Attention: Warren Morse

Conditional Approved: Proposed Paarde Valley PV 2 Solar Photovoltaic Power Energy Facility situated near De Aar in the Northern Cape Province.

After evaluating the site position and reviewing the information received 08 November 2021, the SACAA has **no objection** to the proposed Energy Facility subject to a maximum height of 10m above ground level. Other facilities would be at a height of 24m on the solar site, Transmission/ Power line proposed at 32m.

The above statement is conditional to the developer, providing the SACAA with the "as built" parameters of the facility, which includes the height of the pylon structures conveying power generated by the facility.

This conditional approval is valid for 5 years from the date of this letter.

Note that this SACAA letter of no objection does not substitute or replace other approvals which may be required by the applicant.

Yours truly,

Lizell Stroh

Obstacle Inspector

PANS-OPS Section

Air Navigation Services Department

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OBSTACLE APPROVAL

CAA Obstacle ID

CAA_2021_11_332**APPLICANT**

Applicant Name

Contact Person

Cell Nr

Tel Nr

Email

VAT Nr

Address

City

Province

Postal Code

OWNER

Owner Name

Contact Person

Cell Nr

Tel Nr

Email

Application Date Received Date

Application Type New Shared Replacement

Attachments: GIS/Google File Survey Report
 Plan/Eng Drawing Other

DETAILS OF PROPOSED STRUCTURE

Type of Structure Construction Start Date

Site Name Construction End Date

Site ID

LAT (Degrees) LAT (Minutes) LAT (Seconds) Jib/Guywire (m)

LONG (Degrees) LONG (Minutes) LONG (Seconds) Datum

Site Elevation (m) Notes: Coord Data Source

Substructure Height (m) Other (specify)

Superstructure Height (m) Elevation Data Source

Structure Elevation (m) Other (Specify)

APPROVAL STATUS:

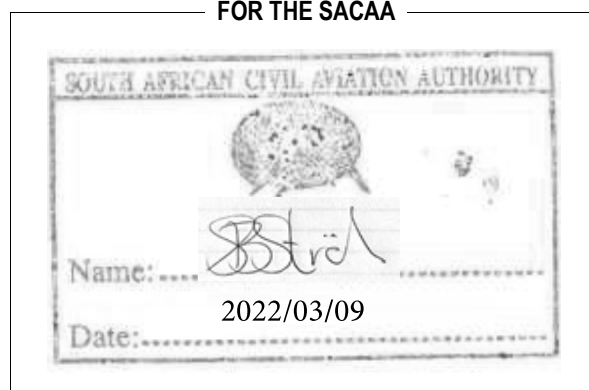
Note: 1. Conditional Approval only valid for 5 years from date of signature.
2. Final approval subject to applicant/owner providing 'As-Built' data.

Approval Conditions:

- No Markings
 Day Markings
 Night Markings
 Day/Night Markings
 UPS
 Other/Special

Other/Special Conditions:

FOR THE SACAA



SOUTH AFRICAN CIVIL AVIATION AUTHORITY

Name:

Date:



Holland & Associates



Environmental Consultants

Impact Assessments - Environmental Management Programs - Compliance Monitoring - Process Review

South African Civil Aviation Authority (SACAA)

Per Email: obstacles@caa.co.za

11 May 2022

Attention: Lizell Stroh

Dear Ms Stroh,

REQUEST FOR COMMENT ON THE PROPOSED PAARDE VALLEY SOLAR PV2 132 KV GRID CONNECTION TO VETLAAGTE MAIN TRANSMISSION SUBSTATION FOR INCLUSION IN THE BASIC ASSESSMENT PROCESS

1 Introduction

Holland & Associates Environmental Consultants has been appointed to undertake the requisite application for environmental authorisation for a proposed grid connection, in accordance with the National Environmental Management Act (NEMA) (No. 107 of 1998) EIA Regulations (2014), as amended. The application for environmental authorisation will require an assessment (Basic Assessment process) of the proposed grid connection corridor.

The National Screening Tool Report was run for the proposed Paarde Valley PV2 Grid Connection corridor on 15 December 2021. The report indicated a "High sensitivity" for the Civil Aviation theme and identified the need for a Civil Aviation Assessment in line with the *Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Civil Aviation Installations* (No. 320 of Government Gazette No. 43110, published 20 March 2020). The designated "High sensitivity" appears to be a result of the proposed project being "*Within 8 km of other civil aviation aerodrome*" and "Medium sensitivity" is designated as a result of the proposed project being "*Within 5 km of an air traffic control or navigation site*" and "*Between 15 and 35 km from a civil aviation radar*". Please refer to Appendix A to see a map of the proposed project and the Civil Aviation sensitivities identified by the Screening Tool. A Shapefile of the proposed grid connection has also been attached to the email with this letter.

Considering the "High sensitivity" identified for this theme, the protocol requires a Compliance Statement to be completed for the proposed project with respect to the potential impacts on Civil Aviation. One of the requirements of the Compliance statement is "*a comment, in writing, from the South African Civil Aviation Authority (SACAA), which may include inputs from the Obstacle Evaluation Committee (OEC), if appropriate, confirming no unacceptable impact on civil aviation installations*". On this basis, Holland & Associates Environmental Consultants (H&A), on behalf of Paarde Valley PV2 (Pty) Ltd (hereafter referred to as the Applicant) kindly request comment

from SACAA on the proposed project. The project background and description are described below in Section 2.

2 Background & Project Description

Environmental Authorisation (EA) for 150 MW Paarde Valley PV2 was granted by the Department of Environmental Affairs (DEA) (now known as the Department of Forestry, Fisheries and the Environment (DFFE)) on 7 September 2012, in terms of the NEMA EIA Regulations (2010). The authorised project includes the construction of a PV solar energy facility to generate approximately 75 – 150 MW on the aforementioned farm, as well as 132 kV / 220 kV overhead transmission lines and associated infrastructure (access roads, water supply infrastructure, stormwater infrastructure, internal access roads, buildings and fencing). Since the EA has been granted, it has undergone four amendments and the EA currently expires on 7 September 2022.

The currently authorised 132kV/ 220kV grid connection for Paarde Valley PV2 is routed from the Paarde Valley PV2 facility to the De Aar substation. However, Eskom has grid capacity constraints in the Northern Cape, and at certain lines and on certain substations. Eskom does not have capacity for the Paarde Valley PV2 to connect at the De Aar substation, accordingly the Applicant wishes to amend the authorised grid connection (realignment and termination point) and create a separate EA for the ESKOM's self-build components (substation & gridline).

Paarde Valley PV2 (Pty) Ltd (hereafter referred to as the Applicant) proposes the construction of a 132 kV, double circuit, overhead powerline (OHPL) grid connection from the authorised on-site substation and switching station at Paarde Valley PV2 to Vetlaagte Main Transmission Station (MTS) (which is currently undergoing its own EA application process). The OHPL is proposed to be approximately 12.7 km in length, and is located in the Strategic Transmission Central Corridor¹. A 200 m corridor (100 m of each side of the line) is to be assessed, as per the provided kml. The final OHPL servitude will be registered as 31 m but during the design development process a corridor of 200 meters is required to allow for minor tower position adjustments. The exact pylon locations will be determined by the outcome of the specialist's investigations, and engineering considerations. On average there will be 4 - 5 towers per km, so that the route will consist of an approximately 40 towers. The teams constructing the OHPL often use cranes and these will fit into an area with a maximum radius of approximately 30 m around the base of each tower, with the final footprint being relatively small. The line will have a capacity of 132kV and will make use of either steel monopole or steel lattice structure in line with Eskom required specifications.

A monopole self-supporting structure has a maximum base of 5 m in diameter above the ground. In some situations the structures have stays. These would fall into the area with a maximum radius of 30 meters, but the stays themselves are hardly exposed at ground level, with only small steel rods protruding from the ground. Lattice towers have a bigger footprint as each has four legs that are a maximum of 15 m apart so that the final footprint would be approximately 15 m x 15 m. The height of either pylon structure will be up to 32 m.

¹No. 113 of Government Gazette No. 41445 published 16 February 2018

The project will also include the switching station component of the authorised Paarde Valley PV2 on-site substation, with an approximate footprint area of 100 m x 100m, and a feeder bay at the Vetlaagte MTS with a capacity of 132 kV, as this needs to be handed over to Eskom with the grid connection self build works once constructed.

In summary, the infrastructure associated with the proposed Grid Connection works for the Paarde Valley PV2 project (and to be handed back to Eskom following construction), includes the following:

- A 132kV, double circuit Overhead Power Line (OHPL) from the Switching Station connecting to the proposed Vetlaagte Main Transmission Substation (MTS)
- 132kV Feeder bay at the Vetlaagte MTS
- Onsite Switching Station (SwS), adjacent to the authorised IPP 132 kV substation. (approximately 100 m x 100 m combined)

The technical details include:

Overhead Powerline:

- Height of pylons Up to 32m
- Type of poles/ pylons to be used: Double Circuit configuration. The alternatives under consideration and to be assessed include Steel lattice or Monopole structures in line with Eskom required specifications
- Transmission line capacity 132kV
- OHPL Service Road (to lie within the OHPL servitude)
 - Length of OHPL service road(s) – Twin tracked service road following line route
 - Width of OHPL service road(s) 6 m

Switching Station:

- Footprint of approximately 50 m – 100 m x 100 m adjacent to IPP Substation
- Area occupied by both permanent and construction laydown areas +-4 Hectares (for grid works only)
- Area occupied by buildings +-1.0 Hectares
- Switching Station Access Road (separate access servitude from the nearest public road to the Switching Station yard)
 - Compacted gravel
 - Length of access road: +- 2.34 km (see attached kmz. file for the route)
 - Width of access road: 8 m .
- Security fencing height: 2.4 m
- Type of fencing: Eskom palisade fencing + chainlink fencing for temporary works
- Control building, relay room, battery room, Generator, storage warehouse water tanks, ablutions
- Laydown area
- Capacity of on-site substation 132kv

The OHPL and Switching station are required to connect the Paarde Valley PV2 Solar farm to the Eskom National Grid. The route selected follows boundary lines and / or existing OHPL routes so as to limit disruption to current farming activities as much as possible.

We trust that the above information provided is adequate for CAA to provide comment on the proposed project for inclusion in the Basic Assessment process. Should further information be required, please do not hesitate to contact the undersigned.

Yours sincerely,



NICOLE HOLLAND (Reg. EAP (EAPASA); BSc Hons, Pr.Sci.Nat)

For: Holland & Associates - Environmental Consultants

APPENDIX A

Map of the proposed Project & Civil Aviation sensitivities

Appendix C9: Proof of Geotechnical Study (to be conducted)



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South Africa

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HOLLAND AND ASSOCIATES ENVIRONMENTAL CONSULTANTS
ATTENTION: Ms Anja Albertyn
Environmental Assessment Practitioner

20 June 2022

Dear Madam,

CONFIRMATION OF PAARDE VALLEY PV2'S INTENT TO COMMISSION THE COMPILATION OF A GEOTECHNICAL STUDY FOR THE PROPOSED GRIDLINE CONNECTION AND ASSOCIATED INFRASTRUCTURE IN DE AAR, NORTHERN CAPE.

We refer to the aforementioned and advise as follows:

A Screening tool report was generated for the proposed gridline which will connect the authorised Paarde Valley PV2 Solar Energy Facility to the proposed Vetlaagte Main Transmission Substation. In response to the required Geotechnical study identified by the Screening tool report, a Site Sensitivity Verification report was compiled and stated that a geotechnical study will be commissioned once the Applicant is awarded Preferred Bidder status.

Paarde Valley PV2 is in the process of finalising the required scope in order for a Geotechnical Scope and Requests for Proposals to be circulated to qualified service providers. In addition, the Project is engaging with Eskom to ensure the design and data of the study is correctly captured in order to meet Eskom's Self Build design standards as the substations and powerline design and underlying studies will be handed back to Eskom once commissioned.

We trust the aforementioned provides you with clarity. If you have any questions or require further clarification, please do not hesitate to contact our offices.

Kind regards

Warren Morse
Authorised Representative
Paarde Valley PV2 (PTY) LTD



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**Proposal for Geotechnical Technical Advisory
– Geotechnical Investigation**

CE2022-090

Rev0 7 June 2022

**Understanding the
Project Requirements**



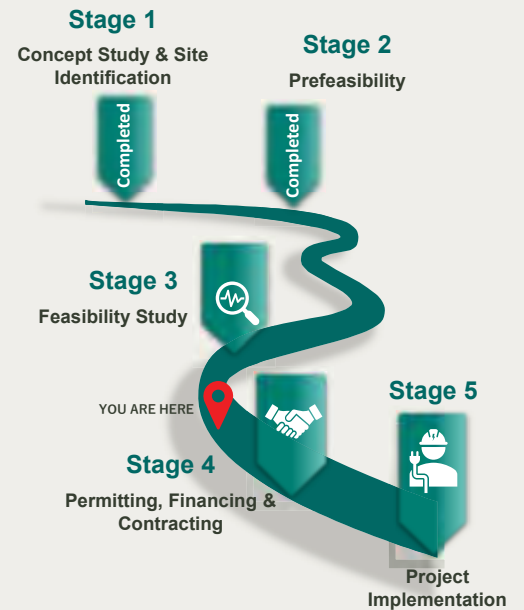
ZUTARI IMPACT. ENGINEERED.

Understanding the Project Requirements

Thank you for the meeting held on Monday 6th June via Teams.

Paarde Valley PV2 has requested Zutari to provide geotechnical technical advisory services. It is understood that the developer typically in the past has procured geotechnical investigations for preliminary project stages. The need is for geotechnical advice related to geotechnical investigations (GI) for detailed design for Solar PV projects.

1. The Developer has identified an opportunity for developing a generic type Geotechnical Investigation Specification document which will form a base document for Geotechnical Investigations. The scoping for a Geotechnical Investigation is site specific driven by available information, past investigations and the ground conditions expected at the site and associated ground risks. This document will include all aspects that could potentially be included in a GI for solar PV outlining project specific details for inclusion and to be scoped by a geotechnical professional for each site. This document will standardize the approach to GI and mitigate rework for each project in relation to creation of GI specifications and BoQ's.
2. The second component of the scope is to provide a scope, specification and BoQ for the geotechnical investigation for the Paarde Valley PV2 site. It is understood that Zutari may undertake the Detailed Design and the scoping of the GI will mitigate risk to the design in ensuring the correct information is acquired and received from the GI works for detailed design and construction.



Understanding the Project Requirements

Understanding of site for Scope 2

Paarde Valley PV 2 Solar project

The proposed development for the solar project is Paarde Valley PV 2 solar facility located north of De Aar adjacent to the existing Mulilo De Aar 10MW Solar Plant. Zutari was appointed for the Hydra Solar Project to the west of De Aar.

Paarde Valley Solar PV2 project

De Aar MW Solar plant



Hydra Solar project



Approach and Methodology

Geotechnical

ZUTARI

Our value add to the project

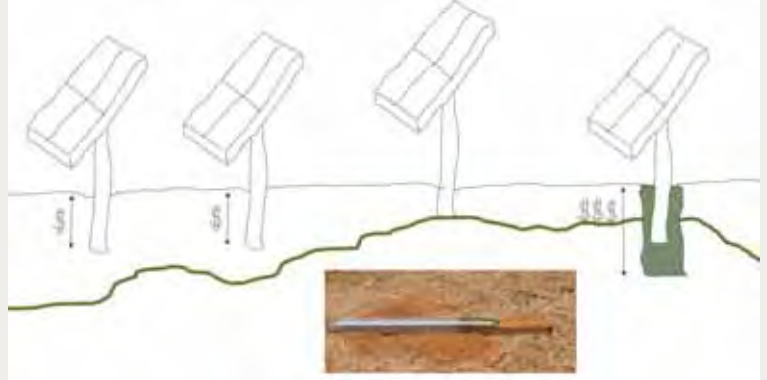
The Zutari team possess the following key strengths and will provide the best value for this project:

- Zutari has an extensive track record with solar farm projects.
- Our geotechnical service offering covers the entire life cycle of a solar project from initial remote studies, field investigation, preliminary and detailed design, specialist site supervision and monitoring and design review. We have worked on over 28 No. solar farm projects totalling over 2.5 GW.
- We have extensive experience working in complex environments and designing the best solutions for our clients for the complex ground conditions anticipated at the site.
- Zutari brings value to the project through our balance of engineering geologists and geotechnical engineers. The interlinked working of the two disciplines brings immense value in the interpretation of ground conditions, drivers for design and the development of the best solutions.
- We bring eminent extensive geotechnical expertise to the project with our Senior Geotechnical Engineer having developed a guideline on derisking solar PV projects from a ground perspective.
- Zutari utilises advanced numerical modelling capability to understand complex environments and ground conditions and develop ground solutions that best manage our client's ground risk.
- Zutari will utilise digital capture of all geotechnical data, this will include capture of the existing geotechnical information and create a geological model of the site using LeapFrog software. This will give the client a 3D view and understanding of the geology of the project site. This allows informed design and construction decisions to be made.
- We have a experience with the local ground conditions.
- We have extensive experience in managing geotechnical investigations and interfacing with many stakeholders.

Approach and Methodology

Economy of scale drives foundations for PV structures where ease and time of installation and foundation pile length are important in ensuring a commercially viable project. Ground conditions and the associated risks to foundation design and installation for solar PV power plant projects continue to pose a large cost risk to developers and contractors.

A change in foundation installation type is often required due to refusal of driven piles, shallow bedrock or soft conditions. This change impacts construction cost where for instance a change from driven to predrilled pile foundations can be in the order of 3x the cost of the originally intended driven pile solution. This has not only cost but programme implications to the project.



Approach and Methodology

A high level of uncertainty exists at the beginning stages of the project and the developer incurs cost to address the relevant uncertainties at each stage. The incurred cost in the early stages is often incurred at risk. Ground investigations undertaken in the early stages of the project are required to inform preliminary foundation design which is used for tender.

A founding solution best suited for the perceived ground conditions is designed for and the potential variability assessed to determine the percentage allowance to be made for any alternative founding solutions due to a change in ground conditions. The ground information available at tender influences the level of ground risk the EPC Contractor is required to carry into construction. This can result in elevated construction prices and potential claims. Detailed Design is undertaken after tender where an optimisation in founding solution and pile length is strived for. The ground risk also relates to the cable design and sizing.

The approach to when the ground investigation is undertaken and what this comprises of is very important to ensure its value to understanding potential ground risks at critical stages of the project.



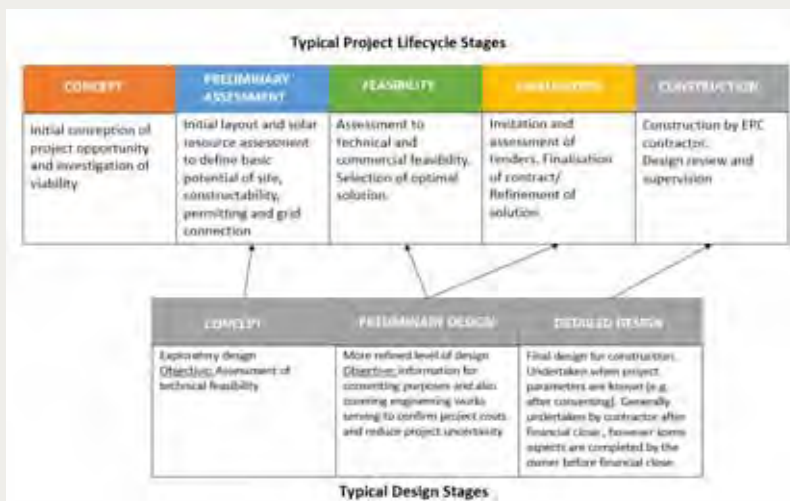
Approach and Methodology

The key to managing ground and foundation risk is:

1. Understanding of what ground risks could occur
2. Apply a structured targeted approach throughout project lifecycle to address ground risks and allow an optimised foundation design to be developed

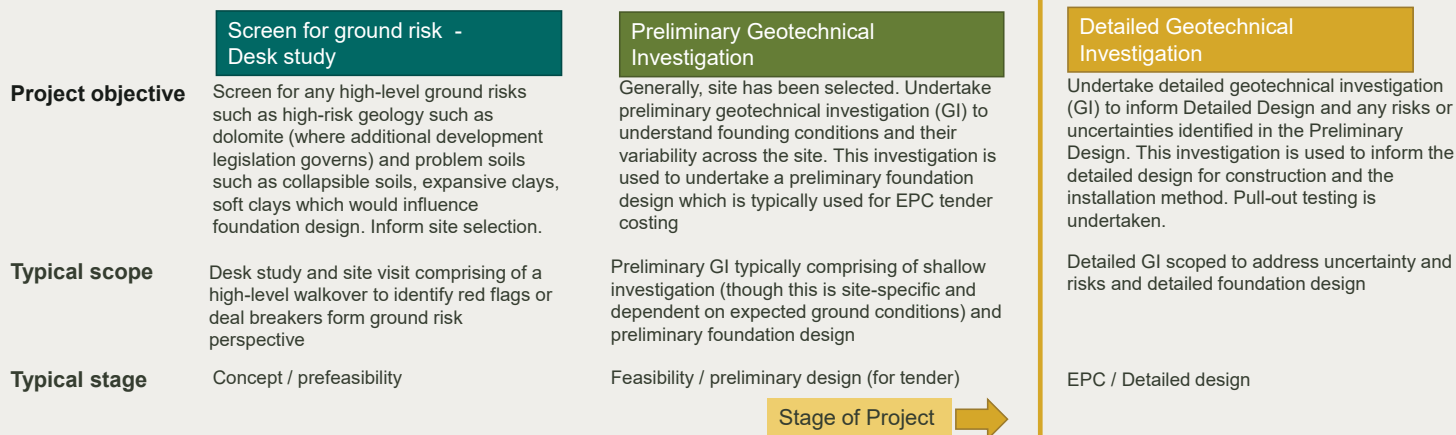
This is applied through the methodology developed by Zutari Ground Engineering. The method and approach has been based on extensive experience on many solar PV projects. The methodology is to map out ground risks and guide the approach throughout the project cycle.

The project lifecycle stages and design stages are summarised alongside. In general, the design stages will typically be undertaken in the project development lifecycle stages as shown alongside however this is project dependent.



Approach and Methodology

- The assessment required to understand ground risks at each stage of the project is tailored to balance technical risk to cost to allow a decision to be made on feasibility and viability of the site from a foundation solution and ground risk perspective.
- The following are typically the stages for geotechnical studies required along the project cycle to understand ground risk and inform preliminary and detailed foundation design. These descriptions are general and could change with project-specific requirements and development stages. The requirements at each stage are to reduce uncertainty balanced by spend at each project stage.



Drivers for foundation design and ground risk



- Depending on the MW of the plant, solar PV plants comprise of some 40,000 to 80,000 No. foundations.
- Solar PV structures are lightly loaded compared with more conventional structures and result in shallow foundations (dependent on the geology of the underlying area).
- However because of economy of scale this results in every 0.1m of length of foundation adding cost to the project.
- Solar PV foundations are driven by the shallow ground profile, and uplift and lateral loads due to wind are generally the driving design case.
- The foundation design and understanding of ground risks is thus driven by:
 - Nature of the material
 - Ground water level
 - Potential corrosivity of the material
 - Stiffness and material consistency with depth
 - Shallow rock and rock outcrops
 - Areas subject to flooding
 - Erodibility of material,
 - The stiffness and variability of the material with depth and spatially, and the
 - Occurrence of problems soils such as highly expansive, soft clays, collapsible soil, dolomite etc.
- These factors all influence the type of foundation and installation required for each project site as well as the risk of a number of foundation types and installation methods being required due to variability in ground conditions across the site. In addition, they influence electrical design such as cable sizing, trenching etc. This all influences the construction cost.

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Geotechnical Investigation scope

A Geotechnical Investigation is scoped to assess:

- Ground water level
- Potential corrosivity of the material
- Stiffness and material consistency with depth
- Shallow rock and rock outcrops
- Erodibility of material
- The stiffness and variability of the material with depth and spatially, and the
- Occurrence of problems soils such as highly expansive, soft clays, collapsible soil, dolomite etc.

Each scope is different for each site as the ground conditions and ground risks differ. In addition, the GI scope is different for each stage of the project as it is scoped and structured to address risk reduction and value creation aligned with the project stage.

For Detailed Design stage, the GI aims to provide a deeper understanding of the site-specific ground conditions required to determine the most appropriate and suitable foundation design for the site and build in allowance for any potential variability to occur in construction. An understanding of the ground risks and potential variability on the site is important at this stage.

The scope also considers available information and previous investigations on a site and aims to use this information to optimize testing and test locations.

A poorly scope geotechnical investigation at any stage of a project will ultimately result in greater costs incurred later in the project either through elevated tender costing to account for uncertainty and risk or costly foundation changes during construction due to change in ground conditions to those assumed during tender which impact programme.

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► Scope 1 – Generic-type Geotechnical Investigation Specification

Zutari will create a generic type Geotechnical investigation Specification.

This will detail methods and tests typically applied for solar PV projects, highlighting where site-specific criteria need to be “inputted”.

It will provide one concise document that forms a template for specification for geotechnical investigations for Solar PV developments. A generic BoQ will be provided to be populated per project.

Scoping of a GI per site will need to be undertaken by a professional Geotechnical practitioner (Geotechnical engineer / engineering geologist) and quantities and scope applied to this generic specification per site.

The generic specification will assist to streamline process and efficiency negating the need to create a new GI specification per project as the template is used as a base standardising process. It also ensures methods and tests related to best practise are included. This will include requirements for ESKOM overhead lines, substations etc.

Deliverable: Geotechnical Investigation Specification and BoQ

► Scope 2 – Geotechnical Investigation Scope and Specification for Paarde Valley PV 2 solar project

It is understood that no intrusive geotechnical investigation works have been undertaken on the site.

The available information for the neighbouring site will be reviewed to understand expected ground conditions and a desk study will be undertaken for the site considering expected geology.

The following information is available for De Aar 10MW Solar Plant adjacent to the site.

- Geotechnical Report for design De Aar Solar Park, Report prepared by ABB South Africa by GCS Consulting, February 2013, Report No. GCS-RP/0010/2013.
- Gestamp Solar, De Aar Site – Preliminary Report on Geotechnical Investigation, Report prepared for Gestamp Solar South Africa, Report No. 447966/1, SRK Consulting, May 2012.
- Test Report, Prieska 20MW ABB & De Aar 10MW ABB, Ground Screw Pull Out Test, Powerway Renewable Energy Co. Ltd, 31/05/2013
- TE REN OPS, Appendix E1, Grid Interconnection Philosophy, Paarde Valley PV2 Solar Energy Facility, 30/05/2022
- Powerway Renewable Energy South Africa, Foundation Design and Calculation Report for ABB South Africa, Mulilo Renewable Energy Solar PV De Aar Park Project, Version V1.4
- Powerway Renewable Energy South Africa, Powerway Ground Screw Pull Out Test Report, ABB De Aar 10 MW Solar Project, 03/08/2013
- Rocklab Report, 24 April 2013, for SRK Consulting



De Aar 10MW solar plant

Scope 2 – Geotechnical Investigation Scope and Specification for Paarde Valley PV 2 solar project

The scope for the GI will comprise the PV array and all associated infrastructure as well as the electrical infrastructure (substations, switching stations, overhead lines etc).

Thermal and electrical resistivity testing shall be included.

The scope does not include a Pile testing specification.

Deliverable:

- Geotechnical Investigation Specification
- Drawing showing test locations and co-ordinates
- BoQ



De Aar 10MW
solar plant

Who are we



Geotechnical

Zutari have a strong cohort of engineering geologists and geotechnical engineers who support our solar energy projects through development and execution. We assist our clients to understand ground risk and how this impacts the different stages of the project cycle. Our services to clients include:

- Geotechnical mapping
- Desktop studies for pre-feasibility
- Preliminary and detailed geotechnical investigations
- Site suitability from geotechnical perspective
- Factual and interpretive reporting
- Aggregate sourcing studies
- Foundation design incorporating soil-structure interaction
- Slope stability
- Verification of founding conditions during construction
- Pile testing to inform design

KEY CONTACTS



Salona Naidoo
Technical Director,
Geotechnical



Dr. Gabi Wojtowicz
Associate,
Geotechnical Engineer



Trevor Pape
Engineering
Geologist

Through the development of our digital database, it provides business intelligence for optioneering studies and project shaping, giving a higher confidence in concept design development and a more efficient scoping for ground investigations.

Why us?

We are lean, agile and adapting to a changing project landscape through the application of design-led thinking, lean methodologies and value co-creation on our projects. Working with our clients to develop the best solutions for complex problems based on a creative approach.

- We assist our clients in understanding and managing ground risk.
- In the project shaping stage, we identify potential geohazards early in the project life-cycle and through a value co-creation framework assist our clients in assessing technical feasibility, business viability, human desirability, system sustainability and project constructability.
- We advise and undertake third-party asset protection assessments through ground movement and building damage assessments utilising soil-structure analyses
- We provide specialist design services for a wide range of geotechnical applications.
- Our detailed, advanced numerical modelling capability allows us to determine driving mechanisms to inform better, design solutions. It also assists the structural engineer to verify superstructure design through provision of optimised springs, foundation forces and moments and post construction effects.



Our Services

Desktop and feasibility studies
Ground investigations and interpretation
Geotechnical risk assessment
Earthworks design
Ground treatment / improvement methods
Slope stability and seismic assessments
Karst and undermining assessments
Shallow and deep foundation design
Tailings

Excavation support and retaining system
Advanced numerical modelling
Geological modelling
Construction impact assessment
Instrumentation planning, implementation and monitoring
Specialist construction supervision
Design verification
Specialist dam engineering geology
Rock engineering

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Key Personnel

ZUTARI



Dr Gabi Wojtowicz
Geotechnical Engineer

Gabi is a senior geotechnical engineer and Associate Design Director at Zutari with more than 15 years' experience. She has worked on a variety of projects throughout the United Arab Emirates, Qatar, Saudi Arabia, Africa, South Africa, United Kingdom and Australia. Her experience includes a wide range of civil infrastructure projects, including tall and super-tall buildings, bridges, sport stadia, large commercial developments, wind and solar farms, railways, large metro projects, harbours and mining infrastructure. Gabi has been responsible for geotechnical analysis, design and design review for a number of Zutari's solar energy projects across sub-Saharan Africa.

Most recent PV project experience include the 20MW Golomoti PV plant (JCM Power) in Malawi, Anglo Solar PV projects across the development portfolio at a number of mines, Total-Mullio Hydra Solar Project and a number of REIPPP and RMIPPP projects. Gabi was the Geotechnical Design Lead responsible for geotechnical investigation, pile testing, prelim foundation design, specifications, review of contractor's detail foundation design and construction support.

Gabi holds a PhD in Geotechnical Engineering from the University of Southampton in the United Kingdom and BEng (Hons) Geotechnical Engineering and BEng Civil Engineering from the University of Pretoria (UP), South Africa. She is also a registered professional engineer with the Engineering Council of South Africa (ECSA) and a member of the South African Institute for Civil Engineering (SAICE). Gabi is the winner of both the Consulting Engineers South Africa (CESA) Aon Excellence in Engineering 'Young Engineer of the Year' award and the SAICE 'Young Engineer of the Year' award in the same year (2016) as well as the South African Professional Services Awards - Built Environment Category - Young Professional of the Year 2018.

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Project Experience

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Project experience Geotechnical Service Offering

Our geotechnical service offering covers the entire life cycle of a solar project from initial remote studies, field investigation, preliminary and detailed design, specialist site supervision and monitoring and design review. **We have worked on 28 No. solar farm projects totalling over 2.5GW.** Balance of Plant is defined as Development (concept & preliminary design, sub-contractor procurement) and Execution (detailed design / design review, quality assurance)

ZUTARI

Capability	Country	Role	Stage	Desk study	Geotechnical Investigation	Reporting	Analysis and Design	Review	Construction, pile testing, site design verification and monitoring
				Overview of topographical, geological and soil maps as well as available information including satellite imagery from Zutari's vast database	The geotechnical investigation is scoped to suit the project stage balancing ground risk with cost. This can comprise of test pitting, rotary core, percussion or sonic drilling, resistivity testing, Continuous Surface Wave (CSW) testing and laboratory testing; Field management and supervision; Geological mapping and zoning	Reports include: Progress reports; Monitoring reports; Factual reports; Geotechnical Interpretative Reports; Final Design Reports (Preliminary and Detailed); Construction and site investigation specifications; Bills of Quantities (BoQs)	Solar PV / CSP foundations; Earthworks; Ground improvement; Construction material identification; Advanced 2D and 3D numerical modelling; back-analysis of pile testing for foundation optimisation	Acting as Owner's Engineer, review of geotechnical and foundation design and geotechnical reports.	Scoping and execution of pile testing; On site design verification of foundation installations; Instrumentation and Monitoring; Site supervision; Inspection and Test Plan (ITPS) and check sheets for construction
7 MW & 75 MW power stations Renova Solar Project	South Africa	BoP	Development	X	X	X			
125MW Solis CSP Solar Farm	South Africa	BoP	Development	X	X	X	X		X
1GW Upington Solar Farm	South Africa	BoP	Development	X	X	X			
100MW Ilanga Solar Substation	South Africa	BoP	Development	X	X	X			
60MW Mogalakwena Solar PV	South Africa	Engineer	Site Selection	X					
Metehara Solar Project	Ethiopia	BoP	Development	X	X	X			
30MWp Redsol Solar PV	Malaysia	BoP	Detailed Design		X	X	X		X
100MW LSS3 Solar PV	Malaysia	BoP	Development	X		X	X		
60MW Salima Solar PV	Malawi	Owner's Engineer	Development					X	X
20MW Golomoti Solar PV Farm	Malawi	BoP	Development	X	X	X	X	X	X
Mocuba Solar Mozambique	Mozambique	BoP	Development						
Sibanye Gold pv solar plant	South Africa			X	X	X			
Leopards Hill Solar Development	Zambia	BoP	Development	X					
A Proposed New 54 MW 'Scaling Solar' PV Power	Zambia	BoP	Development	X	X	X			
Kronos Solar PV facility	South Africa	BoP	Development	X	X	X			
80MW Lephalele solar PV	South Africa	BoP	Development	X	X	X			
216 MW Mulilo-Total Solar PV farms (Hydra & Coega)	South Africa	EPC Engineering Consultant	Construction			X	X		X
100MW Avondale-1 Solar Farm	South Africa	BoP	Development	X	X	X	X		
9 No solar Farms for REIPPP Round 5	South Africa	BoP	Development	X		X	X		
Kumba Iron Ore 2 No. solar Farm	South Africa	BoP	Development	X	X	X	X		

Project Experience

Solar PV

Zutari has an established track record in solar energy, with a selection of our recent roles listed below. A full list of project experience can be provided upon request. We have undertaken a wide variety of roles including development and bid support, Owner's Engineer, Lender's Technical Advisor, detailed design and detailed grid code compliance support.

Owner's Engineer Roles

- Successful projects in South Africa REIPPPP:
 - 75 MW Waterloo Solar PV
 - 68 MW Bokamoso Solar PV
 - 75 MW Prieska PV4 Solar PV
 - 75 MW REISA Kathu PV
 - 75 MW Letsatsi PV
 - 75 MW Lesedi Solar PV
 - 60 MW Boshof Solar PV (Post commercial-ops only)
 - 30 MW Witkop Solar (Post commercial-ops only)
 - 28 MW Soutpan Solar PV (Post commercial-ops only)
- 60 MW Salima Solar PV (Malawi)
- 10 MW Mariental and 10 MW Kokerboom Solar PV (Namibia)

Detailed Design for Solar PV

- 28 MW Golomoti Solar PV/BESS (Malawi)
- 30 MW Redsol Solar PV (Malaysia)
- 220 MW Bungela 1 and 2 Solar Farm (Australia)
- 123 MW Sun Metals Solar Farm (Australia)
- 25 MW Barcaldine Solar Farm (Australia)

Grid Connection Design

- 75 MW Droogfontein II Solar PV
- 75 MW Prieska PV3
- 75 MW Prieska PV4
- 75 MW Zeerust PV
- 50 MW De Wildt PV

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Project experience

Solar PV



Prieska PV4 Facility - 81MW_{DC} - Single-Axis Tracking PV

South Africa
Total Energies Nouvelles & Mullio

Zutari acted as the Owner's Engineer for the utility-scale Prieska PV4 Facility, providing detailed design review, construction monitoring and commissioning verification services, while also supporting the Owner with ad-hoc queries and issues as construction progresses. At the Owner's Engineer Zutari advised the client on Contractual matters including certifying payment milestones and contractor claims.



Salima Solar

Malawi
JCM and InfraCo Africa

Zutari initially supported JCM as Owner's Engineer for this pioneering 60MW project in Malawi and was extensively involved throughout site identification, concept development, feasibility and the early stage of project execution. Zutari's role subsequently shifted to an Engineering Service provider role with JCM taking on a self execution role.



Terraform Portfolio OE -110MW_{AC} Portfolio of 3 projects, Boshof, Witkop and Soutpan

South Africa
Terraform

Zutari has supported Terraform with operational Owner's Engineer services for these three utility plants in South Africa. Services include end of warranty inspection, revised energy production assessment, incident investigations and procurement support for O&M services.



Lesedi PV Installation

South Africa
Lonjas Tecnologia

Lesedi Solar PV installation has an installed capacity of 64MW and is located at Humansrus, near Kimberley in the Northern Cape. It is being developed by SolarReserve, the Kensani Group and Intikon Energy, with Lonjas Tecnologia the appointed Owner's Engineer. Zutari were in turn appointed to provide in-country support to Lonjas, by undertaking technical design review to ensure compliance with local regulations, construction monitoring and environmental monitoring.

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Project experience

Solar PV



Bui solar photovoltaic (PV) feasibility study

Ghana
Strategic Security Systems Ghana

Feasibility study for integrating a solar photovoltaic (PV) facility to the existing hydro power plant in Bui

July 2019 – May 2020



Structural, civil and electrical design review and site supervision on behalf of the owner's engineer for the Lesedi photovoltaic (PV) plant

South Africa
Lonjas Technologia S.A.

Zutari has been appointed by Lonjas Technologia of Spain to assist with the role as owner's engineer during the construction phase of the Lesedi photovoltaic (PV) plant. Zutari contributed to the project through provision of structural, civil and electrical design review and site supervision expertise. Zutari's knowledge of local regulations and standards assisted Lonjas to correctly advise the client on relevant matters. Zutari has also been able to assist the project in the complex technicalities of preparing the facility for connection to the Eskom grid.

January 2013 – May 2014



New 132kV Impala Switching Station and 132/11kV, 1x 80MVA Sishen Solar Facility Substation

South Africa
E+PC Engineering & Project Company

Aveng E+PC approached Zutari to provide them with engineering design services for the grid connection of their Sishen Solar Facility to the national Eskom grid. The solution comprised of the complete design service to ensure compliance to the Eskom Procedure for high voltage (HV) Self-Build Projects (Eskom document 240-43874056).

July 2012 – July 2014



Design, review and site supervision for the Kathu solar photovoltaic (PV) plant

South Africa
Renewable Energy Investments of South Africa (Pty) Ltd (REISA)

The project consisted of the design, procurement construction, operation and maintenance of a photovoltaic (PV) solar plant with 75 MW (AC) capacity located in Kathu, Northern Cape region. Zutari was appointed as the Owner's Engineer by Renewable Energy Investments South Africa (REISA) for the construction and commissioning of the 75 MW single axis tracking solar PV plant.

December 2012 – June 2017

IMPACT ENGINEERED

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