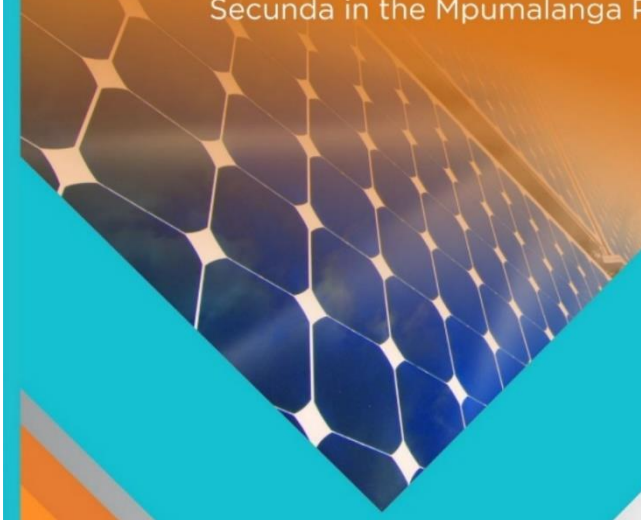
DRAFT BASIC ASSESSMENT REPORT

Proposed Development of a 132 kV Overhead Power Line and Supporting Infrastructure for the Proposed Vhuvhili Solar Photovoltaic Energy Facility, near Secunda in the Mpumalanga Province



APPENDIX G

Environmental Management Programme (EMPr)

ENERTRAG

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1 INTRODUCTION

The Project Applicant, Vhuvhili Solar RF (Pty) Ltd (hereinafter referred to as "Vhuvhili Solar" or "the Applicant")1, is proposing to design, construct and operate the Vhuvhili Solar Energy Facility (SEF) and associated infrastructure approximately 7 km south-east of the town of Secunda in the Govan Mbeki Local Municipality and the Gert Sibande District Municipality, in the Mpumalanga Province. The proposed Vhuvhili SEF will have an export capacity of up to approximately 300 MW. The locality and current footprint of the proposed SEF and its associated Electrical Grid Infrastructure (EGI) are depicted in Figure 1.1.

The proposed Vhuvhili SEF, including an on-site Battery Energy Storage System (BESS) and substation hub, is subjected to a Scoping and Environmental Impact Assessment Process (S&EIA) (MPP/EIA/0001063/2022) as provided in Part 3 of the NEMA EIA Regulations (2014, as amended 2017), which is triggered by, amongst others, the inclusion of Activity 1 listed in GN R325 (Listing Notice 2) that deals with "the development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more" outside an urban area.

In order to transmit the electricity generated from the proposed Vhuvhili SEF into the Sasol grid at the Secunda Synfuels facility for the production of green hydrogen and green aviation fuel, or alternatively to transmit the electricity into the national electrical grid network as part of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), the Project Applicant is undertaking this Basic Assessment Process for the supporting EGI.

Assessed in the BA process is a 132 kV overhead transmission power line which extends approximately 12 km from the proposed Vhuvhili on-site substation to a switching substation at the proposed Mukondeleli Wind Energy Facility (WEF) wherefrom the electricity will be evacuated via the off-taker scenarios discussed below. The switching substation at the Mukondeleli WEF is subject to a separate S&EIA process (MPP/EIA/0001099/2022) which is currently being undertaken by ENERTRAG South Africa (Pty) Ltd (hereinafter referred to as "ENERTRAG" or "the Project Proponent/Developer". A detailed project description is provided in Section 1.2 of this Environmental Management Programme (EMPr).

The Project Developer, ENERTRAG, is currently investigating two scenarios for the uptake of energy from the proposed Vhuvhili SEF:

Scenario 1 (preferred):
The proposed Vhuvhili SEF is planned to provide renewable energy to the Sasol Secunda Synfuels facility for the production of green hydrogen and green aviation fuel. This is viewed as the preferred outcome of the proposed project, via an agreement between several consortium parties including ENERTRAG and Sasol.

[1]It is important to note that Vhuvhili Solar RF (Pty) Ltd is the Project Applicant, whereas ENERTRAG South Africa (Pty) Ltd (hereafter referred to as the "ENERTRAG"), is the Project Developer.

Scenario 2 (alternative):
However, should the above agreement not materialise under Scenario 1, and a private off-taker of the renewable energy cannot be obtained, the proposed Vhuvhili SEF will be bid into future rounds of the REIPPPP or similar bidding processes.

By assessing both scenarios in this BA and the associated potential environmental impacts, it is understood that the Environmental Authorisation (EA) received for the proposed Vhuvhili EGI would be suitable for both scenarios.

ENERTRAG provided four alternative power line routings and EGI sites (i.e., Alternative 1 to 4) to be considered and assessed by the specialists. Please note that ENERTRAG proposes Alternative 1 to be the preferred power line routing and siting for associated EGI. The Project Applicant requested that the specialist assessments include an approximately 100 m buffer around the substation and BESS complexes, and a 200 m wide corridor for the power line routings (100 m on either side of the centre line). This will allow for micro-siting during project construction. It is proposed that a final servitude of 32 m wide will be registered for the 132 kV power line.

The Vhuvhili SEF is not located within any of the Renewable Energy Development Zones (REDZs) gazetted in Gazette 41445, GN R114 on 16 February 2018; and Gazette 44191, GN R144 on 26 February 2021. The proposed Vhuvhili power lines are also not located within any of the strategic power corridors gazetted in Gazette 41445, GN R113 on 16 February 2018. However, the need for the Basic Assessment process is triggered by, amongst others, the inclusion of Activity 11 (i) listed in GN R327 (Listing Notice 1):

> *"The development of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts".*

Therefore, the proposed Vhuvhili EGI requires EA from the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA). A Basic Assessment Process is being undertaken for the proposed 132 kV overhead transmission power line with a 107-day decision-making timeframe, as opposed to a 57-day decision-making timeframe allowed for in the REDZs and strategic power line corridors.

This EMPr is currently being released to all Interested and Affected Parties (I&APs), Organs of State and stakeholders for a 30-day review period extending from **14 November 2022 to 14 December 2022**, excluding public holidays. All comments received during the 30-day comment period will be incorporated into the Final BA Report captured in the Comments and Responses Report that will be submitted with the Final BA Report to Mpumalanga DARDLEA in accordance with Regulation 19 (1) of the 2014 NEMA EIA Regulations (as amended), for decision-making (i.e. approval or refusal) in line with Regulation 24 of GN R326. The Final BA Report and Comments and Responses Report will then be submitted to the DFFE, in accordance with Regulation 19 (1) of the 2014 NEMA EIA Regulations (as amended), for decision-making in terms of Regulation 20. Comments received from stakeholders during this aforementioned review period will be incorporated into this EMPr, where relevant and required. Following the incorporation of comments from I&APs, stakeholders and Organs of State, this EMPr is intended as a "living" document and should continue to be updated regularly, as needed.

1.1 AUTHORS OF THE EMPr

This EMPr has been compiled by the Environmental Assessment Practitioner, Paul Lochner (EAP 2019/745), and environmental consultant in training at the CSIR, Willan Adonis, with inputs provided by the various specialists on the team (as indicated in Table 3). The Curriculum Vitae of Paul Lochner and Willan Adonis are also included in Appendix A of this EMPr.

Paul Lochner (EAP, Technical Advisor and Quality Assurance)

Paul Lochner is an environmental assessment practitioner (EAP) at the CSIR in Stellenbosch, with more than 28 years of experience in a wide range of environmental assessment and management studies. Paul commenced work at CSIR in 1992, after completing a B.Sc. degree in Civil Engineering and a Masters in Environmental Science, both at the University of Cape Town. His initial work at focused on wetlands and estuarine management; environmental engineering in the coastal zone; and coastal zone management plans. Since 2008, Paul has been the leader and manager of the Environmental Management Services (EMS) group within CSIR that has been at the forefront of advancing environmental assessment in South Africa. This group currently consists of approximately 10 to 20 environmental scientists, planners, and engineers, with offices in Stellenbosch, Cape Town and Durban. Paul's particular experience is in environmental planning and assessment for renewable energy, electricity grid infrastructure, desalination, oil & gas, wetlands & coastal zone management, and industrial & port development. He has been closely involvement in the research and application of Strategic Environmental Assessment (SEA) in South Africa, and he has wide experience in Environmental & Social Impact Assessment, Environmental Management Programmes (EMPRs) and Environmental Screening Studies. He has been the project leader for over 40 SEAs and EIAs over the past 28 years. He also served as project leader for a suite of SEAs commissioned by the DFFE from 2014 to 2020.

Paul is a Registered EAP (2019/745) with the Environmental Assessment Practitioners Association of South Africa (EAPASA).

Willan Adonis (Project Officer & GIS mapping)

Willan Adonis is an environmental consultant in training in the CSIR's EMS group. Willan holds a BA, a PGDip and an MPhil (all cum laude) in Development and Environmental Management from Stellenbosch University. After completing his masters, he gained experience in on-site compliance monitoring, assisted with BA reports, compiled EMPRs, and undertook several public participation processes. His key interest lies in how the multi-disciplinary interfaces between Environmental, Social and Governance systems can be used to build stakeholder partnerships and promote sustainable human-environment relationships.

Table 1.1: Details of the BA Project Team

Name	Organisation	Role/ Specialist Study
CSIR Project Team		
Paul Lochner (*Registered EAP (2019/745)*)	CSIR	EAP and Project Leader
Willan Adonis	CSIR	Project Officer & GIS specialist
Specialists		
Johann Lanz *(Pr.Sci.Nat.)*	Private	Agriculture and Soils
Kerry Schwartz	SLR Consulting	Visual Impact Assessment
Dr Jayson Orton	ASHA Consulting	Heritage Impact Assessment
Prof. Marion Bamford	Private	Palaeontology Assessment
Dr Noel van Rooyen *(Pr.Sci.Nat.)*	Ekotrust cc	Terrestrial Biodiversity
Lorainmari den Boogert *(Pr.Sci.Nat.)*, Antoinette Bootsma Nee van Wyk *(Pr.Sci.Nat.)*, Rudi Bezuidenhoudt *(Pr.Sci.Nat.)* and André Strydom	Iggdrasil Scientific Services & Limosella Consulting	Aquatic Biodiversity and Species
Chris van Rooyen and Albert Froneman *(Pr.Sci.Nat.)*	Chris van Rooyen Consulting	Avifauna Assessment
Lizande Kellerman (*Pr.Sci.Nat.*) with inputs from Helen Antonopoulos and Willan Adonis	CSIR	Civil Aviation Compliance Statement
Lizande Kellerman (*Pr.Sci.Nat.*) with inputs from Helen Antonopoulos and Willan Adonis	CSIR	Defence Site Sensitivity Verification

1.2 PROJECT DESCRIPTION

As noted in Section 1, the Project Applicant is proposing the construction of a 132 kV overhead transmission power line and associated EGI to feed the electricity generated by the proposed Vhuvhili SEF to the switching station at the proposed Mukondeleli WEF. The electricity will be transferred from the proposed on-site substation at the proposed Vhuvhili SEF via a 132 kV power line which extends approximately 12 km in length to the proposed switching station at the proposed Mukondeleli WEF.

It is important to note that this BA process only included the assessment of the proposed 132 kV power line to transfer the electricity from the proposed Vhuvhili SEF to the proposed Mukondeleli WEF switching station. The proposed Vhuvhili SEF, including the on-site substation and Battery Energy Storage System (BESS), is subject to a separate Scoping and Environmental Impact Assessment (S&EIA) process which is currently underway (DARDLEA NEAS Reference Number: MPP/EIA/0001063/2022). The proposed Mukondeleli WEF, including the on-site switching station to which the proposed 132 kV power line will connect, is also subject to a separate S&EIA process, as summarised below.

Table 1.2: Details of this BA process and related S&EIA processes underway

Project	Process	Authority Reference Number	EAP	Status	Subject of this application and BA process
Proposed Vhuvhili-to-Mukondeleli 132 kV power line and associated EGI	BA	To be assigned	Paul Lochner (CSIR) (EAP 2019/745)	Application submitted, Draft BA Report out for comment	Yes
Proposed Vhuvhili SEF Proposed on-site substation and BESS complex at the proposed Vhuvhili SEF site	S&EIA	NEAS: MPP/EIA/0001 063/2022	Paul Lochner (CSIR) (EAP 2019/745)	Application submitted. Final Scoping Report accepted. Draft EIA Report released for comment.	No
Proposed Mukondeleli WEF Proposed switching station at the proposed Mukondeleli WEF site	S&EIA	NEAS: MPP/EIA/0001 099/2022	WSP	Application and Final Scoping Report submitted	No

The BA process assessed four power line routing alternatives for the transfer of the electricity generated by the proposed Vhuvhili SEF to the switching station at the proposed Mukondeleli WEF. Please refer to Figure A-2 for the power line routing alternatives which are assessed as part of this BA process. The figure also includes the preferred and alternative substation and BESS complexes at the proposed Vhuvhili SEF site and the two switching station alternatives at the proposed Mukondeleli WEF site.

The specialists assessed the following power line routing alternatives:

Proposed alternatives should the Vhuvhili on-site substation hub A-B (Preferred) be built:

- *Alternative 1 (Preferred) (A to E as marked in Figure A-2)*

  This is the Preferred power line routing should the proposed Preferred on-site substation hub A-B at the Vhuvhili SEF site be built. The proposed 132 kV power line will extend from the Preferred on-site substation hub at the proposed Vhuvhili SEF site to switching station E at the proposed Mukondeleli WEF site.

- *Alternative 2 (A to F as marked in Figure A-2)*

  Alternative proposed 132 kV power line that will extend from the Preferred on-site substation hub A-B at the proposed Vhuvhili SEF site to switching station F at the proposed Mukondeleli WEF site.

Proposed alternatives should the Vhuvhili on-site substation hub C-D (Alternative 2) be built:

- *Alternative 3 (Preferred) (C to E as marked in Figure A-2)*

  This is the Preferred power line routing should the proposed Alternative 2 on-site substation hub C-D at the Vhuvhili SEF site be built. The proposed 132 kV power line will extend from the Alternative 2 on-site substation hub at the proposed Vhuvhili SEF site to switching station E at the proposed Mukondeleli WEF site.

- *Alternative 4 (C to F as marked in Figure A-2)*

  Alternative proposed 132 kV power line that will extend from the Alternative 2 on-site substation hub C-D at the proposed Vhuvhili SEF site to switching station F at the proposed Mukondeleli WEF site.

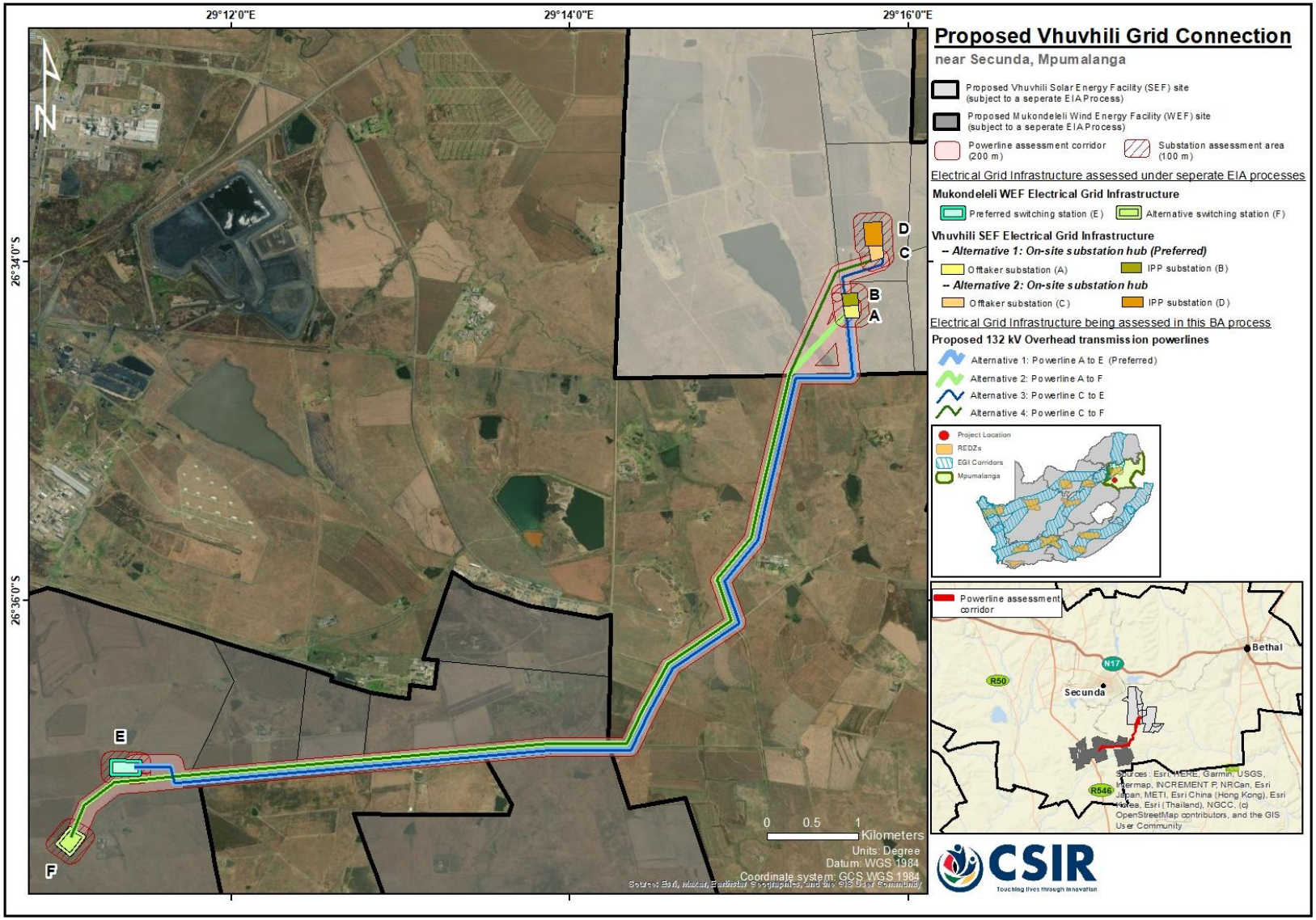

Figure 1.1: Locality map showing the proposed 132 kV overhead power line routing alternatives (that is the subject of this BA Report), which extends from the proposed Vhuvhili SEF (subject of a separate S&EIA process) to the proposed Mukondeleli WEF (subject of a separate S&EIA process).

A description of the key components of the proposed power line and EGI project is provided in **Error! Reference source not found.** below and is also discussed within the forthcoming sub-s ections. It is important to note at the outset that the exact specifications of the proposed project components will be determined during the detailed engineering phase (subsequent to the issuing of EA, should such authorisation be granted for the proposed power line and EGI project) but that the information provided below is seen as the worst-case scenario for the proposed power line project.

Table 1.3: Description of the project components for the proposed 132 kV overhead power line and supporting infrastructure

Component	Description
Power line/pylon height	Up to 40 m
Power line length	Approx. 12 km
Power line capacity	Up to 132 kV (either single or double circuit)
Minimum conductor ground clearance	Approx. 8.1 m
Distance between conductors	Between 2.4 m and 3.8 m
Pylon type, span, working area and footprint	Monopole or steel lattice type pylons, or combination of both where required. The pylons will have a span of 200 m to 350 m for monopole pylons and up to approximately 500 m for lattice structures. The working area required around a pylon position during the construction phase is approximately 30 m x 30 m. The size of the final constructed pylon footprint depends on the type of structure used, which will typically range from approximately 0.5 m^2 to 8 m^2 for monopole pylons, and 36 m^2 to 64 m^2 for steel lattice pylons.
Servitude width	Once built, the registered servitude will be up to 32 m wide in line with guideline and requirements for 132 kV power lines stipulated in the 2011 Eskom Distribution Guide Part 19. Note that the entire servitude will not be cleared of vegetation. Vegetation clearance within the servitude will be undertaken in compliance with relevant standards and specifications. Specialists were required to assess an approximately 200 m wide power line corridor (100 m on either side of the centre line).
Supporting Infrastructure	
Service roads	There are a number of existing gravel farm roads (some just jeep tracks) with widths ranging between 4 m and 5 m located around and within the proposed Vhuvhili power line corridor. A service road of approximately 5 m wide will be required below the power line.
Proximity to grid connection	The proposed 132 kV overhead power line will extend approximately 12 km from proposed Vhuvhili SEF on-site substation to a switching station at the proposed Mukondeleli WEF site.

1.2.1 Substations (subject of separate S&EIA processes)

The BESS and on-site substation at Vhuvhili SEF will be the start point of the proposed 132 kV power line, and the switching station at the Mukondeleli WEF will be the end point of the proposed 132 kV power line. The substation infrastructure is not assessed as part of this BA but is discussed here as it provides the start and end points for the alternative power line routings that are the subject of this BA process.

The Applicant provided four alternative substation sites (i.e., Alternative 1 to Alternative 4) to be considered and assessed in the Vhuvhili SEF S&EIA process, and two alternative switching station sites to be assessed as part of the Mukondeleli WEF S&EIA (Figure 1.1). As depicted in Figure A-2, the Alternative 1 on-site substation hub marked by areas A and B at the Vhuvhili SEF is the Preferred alternative, and the on-site substation hub marked by areas C and D is the alternative option. At the Mukondeleli WEF, the switching station alternatives are marked by areas E and F as depicted in Figure 1.1, where E is the Preferred alternative.

The co-ordinates for the centre-point of the substation site alternatives at the Vhuvhili SEF are noted in Table 4.2, below.

1.2.2 Proposed Power line from Vhuvhili Solar Energy Facility to Mukondeleli Wind Energy Facility

As explained above, a 132 kV power line of approximately 12 km is proposed to feed electricity from the on-site substation hub at the proposed Vhuvhili SEF to the switching station at the proposed Mukondeleli WEF. The applicant provided four alternative power line routings that are linked to the locality of the proposed Vhuvhili on-site substation infrastructure as the starting point of the proposed power line, and the proposed Mukondeleli switching station infrastructure as the end point of the proposed power line.

An overhead power line consists of one or more conductors that are strung (using insulators) on in-line (intermediate) structures and bend (strain) structures. The structures proposed for this 132 kV power line are monopole pylons or steel lattice pylons, or a combination of both where required.

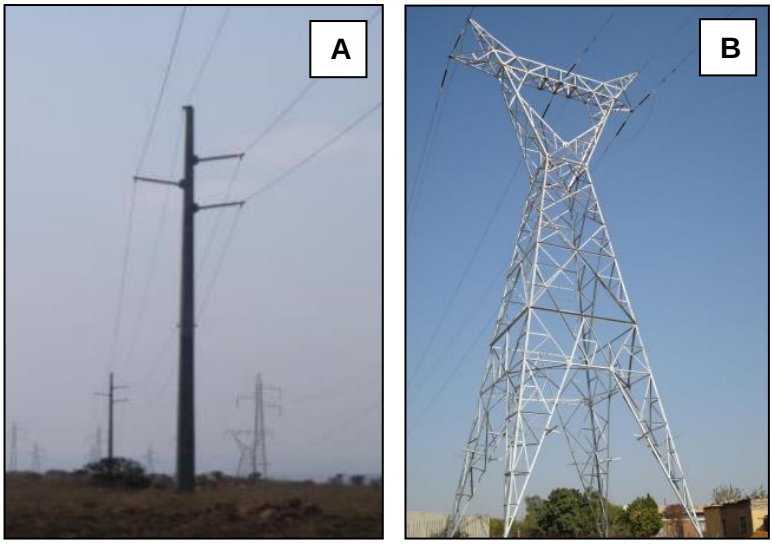

Figure 1.2: Photographs of a typical monopole pylon (A) and steel lattice pylon (B) for a 132 kV power line (Source: Eskom, 2017)

The choice of pylon type depends on the topography and the alignment of the power line corridor such as whether the pylons will be placed within a straight section within the power line corridor (intermediate structures) or at bends (strain structures), as well as how sharp the bend is. The span lengths are estimated to range between 200 m and 350 m depending on the topography and sensitivities of the area. Generally, monopole-type pylons are used for shorter spans, whereas steel lattice-type pylons are used where long spans (>500m) across valleys and rivers are required.

Each structure varies in height from approximately 12 m to 40 m. The size of the footprint depends on the type of structure used, i.e. whether it is an intermediate or strain structure. This will typically range from approximately 0.5 m^2 to 8 m^2 for monopole pylons, and 36 m^2 to 64 m^2 for steel lattice pylons. The size and type of foundation to be installed will depend on underlying geotechnical conditions, i.e. the soil bearing capacity (actual sub-soil conditions). The working area required around a pylon position during the construction phase can range up to 30 m x 30 m.

As noted above, the power line will be constructed within the assessed 200 m wide EGI corridor. The servitude width required for a 132 kV power line is 32 m (i.e. 16m on either side of the centreline).

The exact specifications of the proposed pylon component will be determined during the detailed engineering phase and the information provided here is seen as the worst-case scenario.

1.2.3 Service Roads and External Access Roads

The proposed EGI corridor can be accessed via the D619 gravel road to the west of the northern portion of the corridor and via the tarred D823 road along the southern portion of the corridor. The D823 connects the site with the R546, an arterial route that connects to the N17 national road north of the proposed project.

The current width of the D823 and D619 roads is approximately 5 m. It is proposed that these existing roads will be upgraded and widened to a maximum width of 10 m. The widening and upgrading of the existing roads are being assessed as part of the separate S&EIA process which is currently being undertaken for the proposed Vhuvhili SEF.

Service roads will also be constructed below the power lines for maintenance purposes. The service roads are expected to be composed of gravel and extend approximately 5 m wide. Exact specifications of the widening, length and upgrading of the farm gravel roads will be confirmed during the detailed design phase.

1.3 ENVIRONMENTAL SENSITIVITIES

As noted above, specialists were required to assess an approximately 200 m wide corridor for the proposed overhead power line development and its supporting infrastructure. However, the registered servitude will be up to 32 m wide, or where multiple adjacent power lines occur, in line with the guideline and requirements for 132 kV power lines stipulated in the 2011 Eskom Distribution Guide Part 19.

Based on the findings of the specialist studies, environmental sensitivity maps were produced. These maps show the sensitivities on site (e.g. terrestrial, aquatic, avifaunal, visual, paleontological and heritage features) within the larger assessed area that was identified. Appendix D of this EMPr includes the environmental sensitivity maps which indicate the environmental sensitive areas and features identified within the power line corridor during the BA process (as described above). Based on the specialist studies, the key environmental sensitivities and features that must be avoided in terms of the layout of the power line and supporting infrastructure are listed below (refer to Appendix D for visual representation).

- **Agriculture**
  - The agricultural protocol requires confirmation that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities. However, in the context of the development of overhead power line, almost no land can be considered to have high sensitivity for impacts on agricultural resources. The specialist recommended that, wherever possible, pylons should be located outside of or on the edges of cropland so that they minimise interference with crop cultivation.
  - The protocol requires confirmation in the case of a linear activity, that the land can be returned to the current state within two years of completion of the construction phase. It is hereby confirmed that the land under the overhead power line route can be returned to the current state within two years of construction.

- **Visual**
  - Based on the height and scale of the project, the distance intervals determined for the zones of visual impact are as follows:
    - High impact zone: 0 – 500 m
    - Moderate impact zone: 500 m – 2 km
    - Low impact zone: 2 km – 5 km
  - A 500m zone of potential visual sensitivity has been delineated around the three (3) potentially sensitive farmsteads that are located on Portions 2, 3 and 10 of the Farm Vlakspruit No 292.

- **Heritage (Archaeology and Cultural Landscape)**
  - The vast majority of the proposed corridor (all four alternatives) is likely to be of very low sensitivity. The only areas considered to be of low and low-medium sensitivity were one stone feature and two ruins, respectively; while two areas along the north-eastern portion of Alternatives 3 and 4 corridors are of very high sensitivity because of known graves.
  - Buffers of at least 50 m should be maintained around these graves.
  - The overhead power line infrastructure should not encroach or span over the identified graves and recommended 50 m buffer by micro-siting the final power line alignment within the authorised corridor, should such authorisation be granted.
  - The only other concern is the cultural landscape, but it has already been compromised by the Sasol facility just to the north of the study area and, in the surrounding area, coal mines (effectively adding an industrial layer). As such, the proposed project will make a relatively small contribution to landscape impacts.

- **Palaeontology**
  - Provisional palaeosensitivity mapping of the proposed Vhuvhili power line corridor (all four alternatives) found that the majority of the corridor between Vhuvhili SEF and Mukondeleli WEF will have no impact on fossils. This portion of the corridor is located on non-fossiliferous dolerite dykes of Jurassic age.
  - However, the north-eastern portion of the power line corridor (four alternatives), situated at the Vhuvhili SEF on-site substation, is on potentially very highly sensitive fossiliferous Vryheid Formation rocks, but no fossils would occur on the ground surface. However, potential fossils might be discovered below ground when excavations commence.

- **Terrestrial Biodiversity and Species**
  - The Terrestrial Biodiversity specialist assessment found six highly sensitive drainage lines and dam features within the power line corridor. Along the high sensitivity aquatic features, buffers as delineated by the aquatic specialist should be observed when planning the power line infrastructure. The proposed overhead power line should span these aquatic features and no pylons should be located within the buffer zones.
  - Overall, all other habitat types identified by the terrestrial biodiversity specialist (i.e. natural and disturbed grassland, planted pasture, cropland, and infrastructure) have a low sensitivity.
  - Sections of the gridline fall in a CBA 2, nevertheless, the site location is acceptable in terms of the specialist's ground-truthed sensitivity findings, being of low sensitivity.

- **Aquatic Biodiversity**
  - The majority of the proposed route is located directly adjacent to roads and the impact will thus be limited in extent. Eight wetlands were recorded within the proposed power line corridor. The specialist calculated and recommended the following buffer zones for the wetlands:
    - Seepage with Artificial Characteristics historical trenches – 42 m
    - Valley Bottom Wetlands – 79m
    - Seepage Wetland – 61 m
    - Seepage Wetland – 31 m
    - Valley Bottom Wetlands – 79m
    - Valley Bottom Wetlands – 61m
    - Seepage Wetland – 37 m
    - Dammed section of Floodplain Wetland – 37 m
  - The specialist, therefore, recommended that the wetlands, aquatic ecosystems and the buffer areas are considered of high sensitivity with the exception of one artificial wetland area in proximity to the Mukondeleli switching station F scored as low.
  - The overhead power line infrastructure (pylons) should avoid the delineated aquatic features and recommended buffer areas by spanning across these areas or, where possible, micro-siting the final power line alignment within the authorised corridor, should such authorisation be granted.
  - In terms of Government Notice 509 of 2016, where power line infrastructure (e.g. pylons, etc.) is to be located within the 500 m regulated area of a watercourse, a General Authorisation will need to be obtained by the Applicant for the section 21(i) water use activity as provided in the National Water Act (Act 36 of 1998), as amended,

- **Avifauna**
  - The following avifaunal-relevant anthropogenic habitat modifications were recorded within the 2 km PAOI:
    - Dams: There are several small dams mostly associated with the Klipspruit River and its tributaries. There is one moderately large dam in the north of the PAOI.
    - Agriculture: Agricultural activity present within the PAOI comprises cultivated commercial annuals non-pivot cropland, predominately dedicated towards maize production.
    - Alien trees: Alien trees are present in the PAOI as windbreaks either between agricultural fields or between homesteads.
  - However, the avifaunal specialist found that the PAOI contains confirmed habitat for power line sensitive SCC.
  - The avifauna specialist concluded that the entire PAOI is high sensitivity based on the confirmed occurrence of several power line sensitive SCC (avifauna which could

potential be impacted by power line collisions). The birds move randomly across the whole PAOI, therefore no specific areas can be delineated as being more sensitive than others. The specialist recommended that Bird Flight Diverters must be fitted to the entire power line according to the applicable Eskom Engineering Instruction (Eskom Unique Identifier 240 – 93563150: The utilisation of Bird Flight Diverters on Eskom Overhead Lines) to mitigate the impact on power line sensitive SCC.

- In terms of habitat transformation impact, it was found that the available habitat in the study area is quite extensive from a bird impact perspective, and many of the service roads will be existing roads that will be widened. The loss of a relatively small quantity of the habitat for the power line servitude due to direct habitat transformation associated with the construction of the proposed 132kV overhead power line and associated roads is likely to be low.
- The impacts associated with all four alternative alignments will be practically similar in nature and magnitude, although Alternative 1, being the shortest route, has a marginal benefit in reducing the collision risk. However, any of the alternatives will be acceptable, and the choice of a preferred alternative should therefore be decided based on technical issues, and not avifaunal related impacts.

- **Civil Aviation**
  - No civil aviation related sensitivities were identified.

- **Defence**
  - No defence related sensitivities were identified.

Based on the boundaries of the assessed area and the constraints of the environmental sensitivities, a preliminarily site layout has also been determined for this project (Appendix C of this EMPr). Based on these specialist findings, the final alignment of the power line route within the assessed and approved corridor must avoid the sensitive features that were identified by the specialists (see Appendix D, Map 3).

1.4 IMPACTS IDENTIFIED DURING THE BA PROCESS

Based on the specialist studies (as shown in Table 1.1), the following main direct potential impacts, as indicated in Table 1.4, were identified and appropriate management and mitigation measures included within the EMPr (where required) to ensure the potential impacts are suitably addressed and managed during all phases of the project.

Table 1.4: Impacts identified in the BA Process

IMPACT THEME	IMPACTS IDENTIFIED
AGRICULTURE	**Construction and Decommissioning Phase** • Minimal disturbance to agricultural land (such as erosion and topsoil loss) • Soil degradation - Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Hydrocarbon spillages from construction activities can contaminate soil.
VISUAL	**Construction Phase:** • Large construction vehicles and equipment will alter the natural character of the study area and expose visual receptors to impacts associated with construction. • Construction activities may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. • Dust emissions and dust plumes from increased traffic on the gravel roads serving the construction site may evoke negative sentiments from surrounding viewers. • Surface disturbance during construction would expose bare soil (scarring) which could visually contrast with the surrounding environment. • Temporary stockpiling of soil during construction may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact. • Litter on the construction site may result in visual pollution. **Operational Phase:** • The power line may be perceived as an unwelcome visual intrusion, particularly in more natural undisturbed settings. • The proposed power line will alter the visual character of the surrounding area and expose potentially sensitive visual receptor locations to visual impacts. • Dust emissions and dust plumes from maintenance vehicles accessing the site via gravel roads may evoke negative sentiments from surrounding viewers. **Decommissioning Phase:** • Vehicles and equipment required for decommissioning will alter the natural character of the study area and expose visual receptors to visual impacts. • Decommissioning activities may be perceived as an unwelcome visual intrusion. • Dust emissions and dust plumes from increased traffic on the gravel roads serving the decommissioning site may evoke negative sentiments from surrounding viewers. • Surface disturbance during decommissioning would expose bare soil (scarring) which could visually contrast with the surrounding environment. • Temporary stockpiling of soil during decommissioning may alter the flat landscape. Wind blowing over these disturbed areas could result in dust which would have a visual impact. • Decommissioned infrastructure left on the site may be visually intrusive.
HERITAGE AND CULTURAL LANDSCAPE	**Construction Phase** • Potential impacts to archaeological resources • Potential impacts to graves • Potential visual impacts to the cultural landscape **Operational Phase** • Potential visual impacts to the cultural landscape **Decommissioning Phase** • Potential visual impacts to the cultural landscape

IMPACT THEME	IMPACTS IDENTIFIED
PALAEONTOLOGY	**Construction Phase** • Disturbance, damage or destruction of fossils within the development footprint due to excavations.

TERRESTRIAL BIODIVERSITY AND SPECIES	***Construction Phase:***
	• Direct Impacts
	  o The clearing of natural vegetation
	  o The loss of threatened, protected, CITES listed and/or endemic plants/animals
	  o Loss of faunal habitat
	  o Direct faunal mortalities due to construction and increased traffic
	  o Increased dust deposition
	  o Increased human activity and associated increased noise levels.
	• Indirect Impacts
	  o Establishment of alien vegetation
	
	Operational Phase:
	• Direct Impacts
	  o Refer to avifaunal assessment, if applicable
	• Indirect Impacts
	  o Establishment of alien vegetation
	
	Decommissioning Phase:
	• Direct Impacts
	  o Direct faunal mortalities
	  o Increased dust deposition.
	• Indirect Impacts
	  o Establishment of alien vegetation

AQUATIC BIODIVERSITY	***Construction Phase:*** • Alteration in flow regime; • Changes in sediment regimes; • Introduction and spread of alien vegetation; • Loss and disturbance of riparian/watercourse habitat and vegetation; • Alteration in water quality due to pollution; and • Loss of aquatic biota. ***Operational Phase:*** • Alteration in flow regime; • Changes in sediment regimes; • Introduction and spread of alien vegetation; • Loss and disturbance of riparian/watercourse habitat and vegetation; • Alteration in water quality due to pollution; and • Loss of aquatic biota. ***Decommissioning Phase:*** • Alteration in flow regime; • Changes in sediment regimes; • Introduction and spread of alien vegetation; • Loss and disturbance of riparian/watercourse habitat and vegetation; • Alteration in water quality due to pollution; and • Loss of aquatic biota.
AVIFAUNA	**Construction Phase:** • Displacement due to disturbance associated with the construction of the 132kV power line and supporting infrastructure. • Displacement due to habitat transformation associated with the construction of the 132kV power line and supporting infrastructure. **Operational Phase:** • Mortality of power line sensitive due to collisions with the 132 kV power line (high voltage cables). **Decommissioning Phase:** • Displacement due to disturbance associated with the decommissioning of the 132 kV power line.

2 ABOUT THIS EMPr

2.1 COMPLIANCE WITH RELEVANT LEGISLATION

Section 19 of NEMA requires that an EMPr be submitted where a BA process is being undertaken for an EA application. The content of an EMPr must either contain the information set out in Appendix 4 of the 2014 NEMA EIA Regulations (as amended) promulgated in Government Gazette 40772 and GN R326 on 7 April 2017, or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. As part of the 2016 EGI Strategic Environmental Assessment, a generic EMPr was also compiled for the development and expansion of (a) overhead electricity transmission and distribution infrastructure; and (b) substation infrastructure for the transmission and distribution of electricity. On 2 March 2018, these two Generic EMPrs were gazetted in Government Gazette 41473, GN 162 and GN 163, for public comment for a period of 45 days. **On 22 March 2019, these two Generic EMPrs were gazetted for implementation in Government Gazette 42323, GN 435**. It is therefore understood that these gazetted EMPrs must be applied by all parties involved in the EA Process. This EMPr therefore subscribes to the requirements of the gazetted EMPrs (Gazette 42323, GN 435).

Since the Generic EMPr for power lines has been gazetted and is applicable to the proposed project, the following has been undertaken:

- Section 1 of Part B of the gazetted Generic EMPr contains a pre-approved template with aspects that are common to the development of power line infrastructure. This section will be completed by the contractor, with each completed page signed and dated by the holder of the EA prior to commencement of the activity. This section will not be submitted to the Mpumalanga DARDLEA as it has already been pre-approved (gazetted). To allow I&APs access to the pre-approved EMPr template for consideration through the decision-making process, the template was released with the Draft BA Report. It is included in Appendix E of this EMPr.
- Section 2 of Part B of the gazetted Generic EMPr has been completed to include site specific information, a preliminary infrastructure layout and development footprint site map, and a declaration that the Applicant will comply with the pre-approved template provided in Part B: Section 1 of the gazetted EMPr. This will be submitted to the Mpumalanga DARDLEA for review and decision-making and has been included in Section 4 (site specific information), Section 5 (preliminary infrastructure layout) and Section 6 (declaration of the Applicant) of this EMPr.
- Part C of the gazetted Generic EMPr has been compiled and included in Section 7 of this EMPr. It includes site specific impact management outcomes and impact management actions that are not included in the pre-approved generic EMPr. It will be submitted to the Mpumalanga DARDLEA together with the Draft and Final BA Report, for consideration of, and decision on, the Applications for EA. This section has been prepared by the EAP, with input from relevant specialists. This section of the EMPr is a supplement to the gazetted EMPr and provides site specific mitigation measures identified in the specialist studies contained in Appendix D of the Draft and Final BA Report. It was confirmed with the DEFF Interpretation Query Unit in February 2020 that if Part C the gazetted Generic EMPr is required, the impact management outcomes and impact management actions must be provided; whilst the columns under the headings, “Implementation” and “Monitoring” can only be completed by the relevant parties after the EA is issued (as per Part B – Section 1).

2.2 STRUCTURE AND CONTENTS OF THE EMPr

This Site Specific EMPr includes the following:

- Section 4: Site specific information;
- Section 5: Preliminary infrastructure layout and development footprint site map;
- Section 6: Declaration that the Applicant will comply with the pre-approved template provided in Part B: Section 1 of the gazetted EMPr (which is included in Appendix E of this EMPr);
- Section 7: Site-Specific EMPr as required by Part C of the gazetted EMPr.

The Site-Specific EMPr follows the same template as that of Part B – Section 1 of the gazetted EMPr, as recommended. Where applicable, each section of the Site-Specific EMPr is divided into the following four phases of the project cycle:

- Planning and Design Phase;
- Construction Phase;
- Operational Phase; and
- Decommissioning Phase.

The overall goal for environmental management for the proposed project is to plan, design, construct and operate the project in a manner that:

- Minimises the ecological footprint of the project on the local environment;
- Minimises impacts on fauna, flora and freshwater ecosystems;
- Facilitates harmonious co-existence between the project and other land uses in the area;
- Enhances the socio-economic benefits in the local area; and
- Contributes to the environmental baseline and understanding of environmental impacts of EGI in a South African context.

In this EMPr, the following spatial parameters apply to the management actions, unless where specified differently:

- The study site demarcated as the proposed Vhuvhili power line corridor that was assessed (i.e. approximately 289 ha).

2.3 HOW TO USE THIS EMPr

This EMPr is intended to serve as a guideline to be used by the EA holder and any person/s acting on behalf of holder, during the planning and design, construction, operational and decommissioning phases of the development. This EMPr provides clear direction on the selection and implementation of appropriate environmental management and control techniques during the life cycle of the development. The mitigation, management, and monitoring measures prescribed in this EMPr must be seen as binding to the EA holder and any person acting on its behalf, including but not limited to agents, employees, associates, guests or any person rendering a service to the development site.

It is essential that this EMPr be carefully studied, understood, implemented and adhered to as far as reasonably possible, throughout all phases of the proposed development. A copy of the EMPr

must be retained by the EA holder, and an additional copy must be kept on site at all times during the above mentioned phases of the development.

This EMPr must be included in all tender documentation and contracts compiled for potential bidders and subsequent contractors and subcontractors employed by the EA Holder, as this EMPr identifies and specifies the procedures to be followed by engineers and other contractors to ensure that the adverse impacts of construction and maintenance activities are either avoided or reduced. Appointed contractors must make adequate financial provision to implement the environmental management measures specified in this document.

This EMPr must be seen as a working document, which may be amended as and when needed, to accommodate changing circumstances on site or in the surrounding environment, or in order to accommodate requests/ conditions issued by the competent authority, the Mpumalanga DARDLEA. Amendments to this EMPr must first be approved by the competent authority, in writing, before being implemented.

3 ROLES AND RESPONSIBILITIES

Since the Generic EMPrs are applicable for the proposed power line, it is best to adopt the definitions of the roles and responsibilities as captured in the gazetted EMPrs of GN 435. This will allow consistency of the management of the project from an environmental perspective and will avoid any contradiction in terms of the roles and responsibilities.

The generic roles and responsibilities required for key role players are those of the:

- Project Developer / Developer's Project Manager (DPM);
- Developer Site Supervisor (DSS)
- Environmental Control Officer (ECO);
- Developer's Environmental Officer (DEO);
- Contractor; and
- Contractor's Environmental Officer (CEO).

The definitions of the roles and responsibilities are included in Appendix B of this EMPr.

The Project Developer/Applicant has considered the guideline to the roles and responsibilities included in the Generic EMPr for substations (GN 435) for the implementation thereof. However, the Project Developer/Applicant has identified corresponding terminology for each of these project-specific roles as highlighted in the table below:

Roles and responsibilities in the Government Gazetted EMPrs of GN 435 for the construction phase	**Terminology used for the corresponding roles and responsibilities in the Vhuvhili project for the construction phase**
Project Developer / Developer's Project Manager (DPM)	Project Owner
Developer Site Supervisor (DSS)	Project Owner's Site Supervisor
Environmental Control Officer (ECO)	ECO

Developer's Environmental Officer (DEO)	Project Owner's Environmental Officer
Contractor	Engineering, Procurement and Construction (EPC) Contractor
Contractor's Environmental Officer (CEO)	CEO
Roles and responsibilities for the operational phase for the Vhuvhili facility	
• Operations and Maintenance (OM) Contractor • Facilities Manager (Owner)	

The definitions of the roles and responsibilities are included in **Appendix B** of this EMPr, showing how the roles described above for the Vhuvhili project correspond with generic roles used in EMPrs.

4 SITE SPECIFIC INFORMATION

4.1 CONTACT DETAILS AND DESCRIPTION OF THE PROJECT

4.1.1 Details of the Applicant

Name of Applicant	Vhuvhili Solar RF (Pty) Ltd
Name of Applicant Representative	Mercia Grimbeek
Telephone Number:	+27 21 207 2185
Postal Address:	Suite 104, 1st Floor, Albion Springs, 183 Main Road, Rondebosch, Cape Town, 7708
Physical Address:	Suite 104, 1st Floor, Albion Springs, 183 Main Road, Rondebosch, Cape Town, 7708

4.1.2 Details and Expertise of the EAP and Co-author

Company of the EAP	Council for Scientific and Industrial Research (CSIR)
Name of EAP	Paul Lochner (EAPASA Reg.No. 2019/745)
Telephone Number:	+27 21 888 2400
Email Address:	plochner@csir.co.za
Expertise of the EAP (Curriculum Vitae included):	**Qualifications:** ▪ MPhil Environmental Science ▪ BSc Civil Engineering awarded with Honours **Experience:** ▪ Paul has more than 28 years of experience in environmental assessment and management. **Professional Registration and Affiliations:** ▪ Registered EAP (2019/745) with the Environmental Assessment Practitioners Association of South Africa (EAPASA) ▪ International Association for Impact Assessment, South African Affiliate. **Curriculum Vitae of Paul Lochner is included in Appendix A of this EMPr.**

Company of the co-author	Council for Scientific and Industrial Research (CSIR)
Name of co-author	Willan Adonis
Telephone Number:	+27 21 888 2402

Email Address:	wadonis@csir.ac.za
Expertise of the co-author (Curriculum Vitae included):	**Qualifications:** ▪ MPhil Environmental Management (Cum laude) ▪ PGD Environmental Management (Cum laude) ▪ BA Development and Environment (Cum laude) **Experience:** ▪ Willan has 1 years' experience in environmental assessment and has worked on more than 15 environmental management projects, including the compilation of EMPRs and conducting on-site compliance monitoring as an environmental control officer (ECO). **Professional Registration and Affiliations:** ▪ International Association for Impact Assessment, South African Affiliate. **Curriculum Vitae of Willan Adonis is included in Appendix A of this EMPr.**

4.1.3 Project Name

Project Name	Basic Assessment for the Proposed Development of a 132 kV Overhead Power Line and Supporting Infrastructure for the Proposed Vhuvhili Solar Photovoltaic Energy Facility, near Secunda in the Mpumalanga Province.

4.1.4 Description of the Project

Refer to Section 1.2 of this EMPr for a detailed description of the proposed project.

4.1.5 Project Location

The power line corridor starts at approximately 6 km south-east of the town of Secunda (at S26° 33' 58.80" E29° 15' 49.11") and runs to a point some 11 km south of Secunda (S26° 37' 24.57" E29° 11' 04.12") in the Mpumalanga Province. The power line corridor traverses the Govan Mbeki Local Municipality in the Gert Sibande District Municipality. The Project Developer provided four power line routing alternatives which traverse the farm portions indicated in Table 4.1.

Table 4.1: Affected Farm Portions for the Four Power line Routing Alternatives

INFRASTRUCTURE				AFFECTED FARM PORTIONS		
Power line (subject of this BA process)				Farm	Portion	SG code
Alt 1 (pref)	Alt 2	Alt 3	Alt 4			
		x	x	Grootvlei No.293	20/293	T0IS00000000029300020
x	x	x	x	Grootvlei No.584	RE/584	T0IS00000000058400000
x		x		Vlakspruit No.292	RE/292	T0IS00000000029200000
x	x	x	x	Vlakspruit No.292	19/292	T0IS00000000029200019
x	x	x	x	Vlakspruit No.292	14/292	T0IS00000000029200014
x	x	x	x	Vlakspruit No.292	15/292	T0IS00000000029200015
x		x		Vlakspruit No.292	13/292	T0IS00000000029200013

INFRASTRUCTURE				AFFECTED FARM PORTIONS		
Power line (subject of this BA process)				Farm	Portion	SG code
Alt 1 (pref)	Alt 2	Alt 3	Alt 4			
x	x	x	x	Vlakspruit No.292	3/292	T0IS00000000029200003
x	x	x	x	Vlakspruit No.292	2/292	T0IS00000000029200002
x	x	x	x	Vlakspruit No.292	16/292	T0IS00000000029200016
x	x	x	x	Vlakspruit No.292	18/292	T0IS00000000029200018
x	x	x	x	Knoppies No.314	RE/314	T0IS00000000031400000
x	x	x	x	Brandwacht No.316	3/316	T0IS00000000031600003
x	x	x	x	Bosjesspruit No. 291	6/291	T0IS00000000029100006
x	x	x	x	Bosjesspruit No. 291	13/291	T0IS00000000029100013
x	x	x	x	Bosjesspruit No. 291	10/291	T0IS00000000029100010
x	x	x	x	Bosjesspruit No. 291	11/291	T0IS00000000029100011
x	x	x	x	Tondershoek No. 317	2/317	T0IS00000000031700002
	x		x	Tondershoek No. 317	12/317	T0IS00000000031700012

Table 4.2: Co-ordinates of the start, middle and end points of the proposed preferred and alternative 132 kV overhead power line corridors.

Infrastructure		Point	Degrees, Minutes, Seconds	
			Longitude (X)	Latitude (Y)
Power line (subject of this BA process)	Alternative 1 (A to E) - Preferred	Start	29° 15' 39.34590120" E	26° 34' 15.51316800" S
		Middle	29° 14' 25.03393800" E	26° 36' 43.09497720" S
		End	29° 11' 25.76041080" E	26° 36' 57.98754360" S
	Alternative 2 (A to F)	Start	29° 15' 39.34590120" E	26° 34' 15.51316800" S
		Middle	29° 14' 10.70307240" E	26° 36' 52.08826680" S
		End	29° 11' 04.11716400" E	26° 37' 24.57291360" S
	Alternative 3 (C to E)	Start	29° 15' 49.12692120" E	26° 33' 58.72557240" S
		Middle	29° 14' 31.16146560" E	26° 36' 31.31159760" S
		End	29° 11' 25.76041080" E	26° 36' 57.98754360" S
	Alternative 4 (C to F)	Start	29° 15' 49.12692120" E	26° 33' 58.72557240" S
		Middle	29° 14' 21.26148720" E	26° 36' 51.02650080" S
		End	29° 15' 39.34590120" E	26° 34' 15.51316800" S

4.1.6 Preliminary Technical Specification of the Overhead Power lines

Refer to Section 1.2 of this EMPr for the preliminary technical specifications of the overhead power line and supporting infrastructure.

5 LAYOUT AND DEVELOPMENT FOOTPRINT SITE MAP

This section includes maps of sensitivities, as well as the preliminary infrastructure layout. As noted above, the feature and sensitivity map were prepared based on specialist findings and existing databases. Individual feature and sensitivity maps are included in the specialist studies (Appendix D of the BA Report). Individual feature maps for each specialist theme, where relevant, are also included in Section B and Section D of the BA Report. Relevant to this EMPr, the combined sensitivity and layout maps for the proposed development are included in Appendix C and D of this EMPr.

With reference to Appendix D, Map 3, Table 5.1 below provides the start and end coordinates of the sensitive sections of the power line alternative routings that must be avoided by the final power line design (i.e. pylon positioning and/or alignment) through aerial crossing these features and/or micro-siting within the approved corridor. It must be noted, that in the case of graves, these features should not be aerial crossed to mitigate socio-cultural concerns. Rather, micro-siting within the approved corridor should be undertaken, and all power line infrastructure including the associated service track must maintain a buffer of 50 m from the graves.

Table 5.1: Sensitive sections along the power line alternative routings which should be aerial crossed or avoided through micro-siting within the corridor (see Appendix D, Map 3)

Sensitive section no.	Feature Description	Avoidance measure	Length (m)	Applicable (x)				Start		End	
				Alt 1	Alt 2	Alt 3	Alt 4	Long (X)	Lat (Y)	Long (X)	Lat (Y)
1	Graves	Micro-site within corridor alongside graves and respective buffer	68			x		29° 15' 36.02850" E	26° 34' 11.36041" S	29° 15' 36.25567" E	26° 34' 13.54559" S
2	Aquatic	Aerial crossing	135	x		x		29° 15' 37.94499" E	26° 34' 29.79574" S	29° 15' 38.39942" E	26° 34' 34.16701" S
3	Aquatic	Aerial crossing	314	x		x		29° 15' 27.62318" E	26° 34' 40.10679" S	29° 15' 38.85605" E	26° 34' 38.55951" S
4	Aquatic	Aerial crossing	364		x			29° 15' 32.08309" E	26° 34' 26.13071" S	29° 15' 23.60178" E	26° 34' 35.15157" S
5	Aquatic & Graves	Aerial crossing (aquatic) & Micro-site within corridor alongside graves and respective buffer	351				x	29° 15' 27.08436" E	26° 34' 22.28783" S	29° 15' 22.24986" E	26° 34' 32.82330" S
6	Aquatic	Aerial crossing	424	x	x	x	x	29° 15' 9.43426" E	26° 35' 20.23185" S	29° 15' 6.35413" E	26° 35' 33.72777" S
7	Aquatic	Aerial crossing	329	x	x	x	x	29° 14' 43.98273" E	26° 36' 17.62180" S	29° 14' 34.84993" E	26° 36' 24.46176" S
8	Aquatic	Aerial crossing or micro-site within authorized corridor	133	x	x	x	x	29° 14' 25.74053" E	26° 36' 41.60936" S	29° 14' 23.85757" E	26° 36' 45.56827" S
9	Aquatic	Aerial crossing	201	x	x	x	x	29° 14' 2.22669" E	26° 36' 52.07988" S	29° 13' 54.97131" E	26° 36' 52.07271" S
10	Aquatic	Aerial crossing	95	x	x	x	x	29° 13' 38.81147" E	26° 36' 53.28408" S	29° 13' 35.38790" E	26° 36' 53.58583" S

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6 APPLICANT DECLARATION

Sub-section 3: Declaration

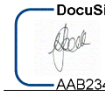
The proponent/applicant or holder of the EA affirms that he/she will abide and comply with the prescribed impact management outcomes and impact management actions as stipulated in part B: section 1 of the generic EMPr and have the understanding that the impact management outcomes and impact management actions are legally binding. The proponent/applicant or holder of the EA affirms that he/she will provide written notice to the CA 14 day prior to the date on which the activity will commence of commencement of construction to facilitate compliance inspections.

Name: ___Mercia Grimbeek_____

Position: _____Director: Project Development_____

Signature Proponent/applicant/ holder of EA Date:

DocuSigned by:



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7 PROJECT SPECIFIC EMPR

The project specific EMPr is presented below per specialist theme.

7.1 SOILS AND AGRICULTURE

Important Note: The Agricultural Compliance Statement has concluded that 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. Please refer to Appendix D.1 of the Draft BA Report for the Agricultural Compliance Statement.

7.2 VISUAL IMPACTS

Impact Management Outcomes: Reduce visual intrusion of construction, operational and decommissioning activities and infrastructure on the surrounding landscape and receptors.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
PLANNING AND DESIGN PHASE						
▪ Appoint a suitably qualified person, such as a landscape architect, to give attention to the concept and design of the aesthetic aspects of the project during the detailed design phase of the project prior to construction to integrate the design with the surrounding landscape to ensure that the project blends in physically and aesthetically with the environment. ▪ Ensure that the construction camps and stockpiles and other facilities are located in in areas already impacted such as existing farmyards, visually unobtrusive areas, away from public roads. ▪ Limit the area of disturbance for construction camp or sites and lay-down areas.	To be completed post EA by relevant parties					

Impact Management Outcomes: Reduce visual intrusion of construction, operational and decommissioning activities and infrastructure on the surrounding landscape and receptors.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ Keep maintenance and access roads as narrow as possible, and use existing roads or tracks as far as possible. ▪ Avoid the placement of power lines on hillcrests and ridge skylines where possible. ▪ Use monopoles in preference to lattice pylons, as far as possible/ where feasible.						
CONSTRUCTION PHASE						
▪ Carefully plan to minimise the construction period and avoid construction delays. ▪ Restrict construction activities to daylight hours to negate or reduce the visual impacts associated with lighting. ▪ Position storage/stockpile areas in unobtrusive positions in the landscape, where possible. ▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. ▪ Vegetation clearing should take place in a phased manner. ▪ Make use of existing gravel access roads where possible. ▪ Limit the number of vehicles and trucks travelling to and from the construction site, where possible. ▪ Ensure that suitable dust suppression techniques are implemented: o on all access roads; o in all areas where vegetation clearing has taken place; o on all soil stockpiles. ▪ Maintain a neat construction site by removing litter, rubble and waste materials regularly.	To be completed post EA by relevant parties					

Impact Management Outcomes: Reduce visual intrusion of construction, operational and decommissioning activities and infrastructure on the surrounding landscape and receptors.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
OPERATIONAL PHASE						
▪ Where possible, limit the amount of security and operational lighting associated with the power line development. ▪ Where possible, avoid placing lights on pylon structures. ▪ As far as possible, limit the number of maintenance vehicles using access roads. ▪ Ensure that suitable dust suppression techniques are implemented on all gravel access roads. ▪ Non-reflective surfaces should be utilised where possible.	To be completed post EA by relevant parties					
DECOMMISSIONING PHASE						
▪ All infrastructure that is not required for post-decommissioning use should be removed. ▪ Carefully plan to minimize the decommissioning period and avoid delays. ▪ Position storage/stockpile areas in unobtrusive positions in the landscape, where possible ▪ Maintain a neat decommissioning site by removing rubble and waste materials regularly. ▪ Ensure that dust suppression procedures are maintained on all gravel access roads throughout the decommissioning phase. ▪ All cleared areas should be rehabilitated as soon as possible.	To be completed post EA by relevant parties					

7.3 HERITAGE IMPACTS (ARCHAEOLOGY, PALAEONTOLOGY, AND CULTURAL LANDSCAPE)

Impact Management Outcomes: Avoid impacts (preferred) or locate and sample or rescue sites/burials before disturbance. Rescue information, artefacts or burials before extensive damage occurs. Minimise landscape scarring						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
PLANNING AND DESIGN PHASE						
▪ Appoint archaeologist to conduct a pre-construction survey of the final alignment once the final detailed design is completed so as to determine whether there are any further areas requiring avoidance or mitigation. This survey is to focus on the micro-siting of the pylon footprints and the alignment of the service road within the authorised corridor. ▪ Ensure disturbance is kept to a minimum and does not exceed project requirements.	To be completed post EA by relevant parties					
CONSTRUCTION PHASE						
<u>Archaeological and cultural impact mitigation</u> ▪ If any archaeological material or human burials are uncovered during the course of development then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist. Such heritage is the property of the state and may require excavation and curation in an approved institution. ▪ Micro-siting of infrastructure where possible to minimise impacts. ▪ Ensure disturbance is kept to a minimum and does not exceed project requirements. ▪ Report any chance archeological finds to determine the best way forward. ▪ If power line routing Alternative 3 or Alternative 4 are used, before construction starts, the graveyard must be fenced with a farm-style wire fence with a pedestrian gate to facilitate public access. The fence must be placed a	To be completed post EA by relevant parties					

Impact Management Outcomes: Avoid impacts (preferred) or locate and sample or rescue sites/burials before disturbance. Rescue information, artefacts or burials before extensive damage occurs. Minimise landscape scarring						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
minimum of 5 m away from all graves. The power line and associated service track must be located at least 50 m from the graves. ▪ Minimise duration of construction period. ▪ Make use of existing tracks where possible for final alignment. ▪ Ensure effective rehabilitation of areas not needed during operation. <u>Palaeontological impact mitigation</u> ▪ The ECO should be made aware of the possibility that fossil remains (e.g. plants and bones, etc.) may be unearthed during excavations in the north-eastern portion of the corridor as delineated in the EMPr. ▪ Photographs of similar fossils must be provided to the construction contractor (as included in the Appendix E of the EMPr) and must be incorporated into the training, environmental awareness, and induction programme for construction personnel. ▪ During excavations the rocks and discard must be given a cursory inspection by the environmental officer or designated person. Only if fossils are found in the delineated potential fossiliferous rock, then the Chance Fossil Finds Protocol (see Appendix E of this EMPr) must be implemented. Any fossiliferous material (plants, insects, bone or trace fossils) should be put aside in a suitably protected place. This way the project activities will not be interrupted. Photographs must be sent to a palaeontologist for a preliminary assessment and if deemed necessary a palaeontologist should visit the site. Any fossils found by the palaeontologist should be removed under the appropriate SAHRA permit and all fossil material collected must be properly curated in an approved repository. ▪ Monitoring for fossil remains on an on-going basis by Environmental Site Officer (ESO) / DEO / CEO during the construction phase.						

Impact Management Outcomes: Avoid impacts (preferred) or locate and sample or rescue sites/burials before disturbance. Rescue information, artefacts or burials before extensive damage occurs. Minimise landscape scarring						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ The standard Chance Fossil Finds Protocol must be implemented by the ECO / ESO / DEO / CEO and, where necessary, a palaeontological specialist (refer to Appendix E of this EMPr).						
OPERATIONAL PHASE						
▪ Ensure that the relevant construction mitigation and management measures are adhered to during the operation phase. ▪ Ensure disturbance is kept to a minimum and does not exceed project requirements ▪ Ensure that all maintenance vehicles and activities stay within designated areas.	To be completed post EA by relevant parties					
DECOMMISSIONING PHASE						
▪ Ensure that the construction mitigation and management measures are adhered to during the decommissioning phase. ▪ Ensure disturbance is kept to a minimum and does not exceed project requirements. ▪ Minimise duration of decommissioning period. ▪ Ensure effective rehabilitation of all areas after completion.	To be completed post EA by relevant parties					

7.4 TERRESTRIAL BIODIVERSITY

▪ **Impact Management Outcomes: Maintain all activities to the designated footprint and existing roadways or built structures. Avoidance of unnecessary disturbance to site and surrounds and established buffers where required. Ensure appropriate management of alien vegetation on site. Minimize the alteration of plant communities and fossorial species.**						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
PLANNING AND DESIGN PHASE						
▪ Project Developer and Appointed Ecological Specialist to ensure that the placing of infrastructure takes the sensitivity mapping of the ecological assessment into account to avoid and reduce impacts on sensitive habitats and protected species. ▪ Ensure the necessary permits or licenses are identified and applied for as applicable. Await response and provision of permit. Undertake plant rescue if and where required by permits. ▪ Ensure compliance with relevant Environmental Specifications for the control and removal of alien invasive plant species. Appoint a specialist or contact relevant authorities to seek guidance on the removal of the alien vegetation on site (see Appendix G). Compile and finalise invasive alien plant management programme (see Appendix G).	To be completed post EA by relevant parties					
CONSTRUCTION PHASE						
<u>General</u> ▪ Construction crew, in particular the drivers, should undergo environmental training (induction) to increase their awareness of environmental concerns. This includes awareness as to remaining within demarcated construction areas, no littering, handling of pollution and chemical spills, avoiding fire hazards and minimising wildlife interactions.	To be completed post EA by relevant parties					

▪ **Impact Management Outcomes: Maintain all activities to the designated footprint and existing roadways or built structures. Avoidance of unnecessary disturbance to site and surrounds and established buffers where required. Ensure appropriate management of alien vegetation on site. Minimize the alteration of plant communities and fossorial species.**						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ Proper waste management procedures should be in place to avoid litter, food or other foreign material from lying around and all waste material should be removed from the site. ▪ Speed limits should be strictly adhered to. ▪ No construction activity should be allowed on site at night. ▪ Ensure construction activities are limited to the development footprint in order to minimise the extent of impact ▪ Ensure that all temporary use areas e.g. laydown areas and construction camp, are located in areas of low sensitivity. ▪ Footprints of the pylons, roads and substation locations should be clearly demarcated. ▪ Ensure that dust control measures are in place. Excessive dust can be reduced by spraying water onto the roads or other disturbed areas during construction activities. ▪ Impose a speed limit on construction vehicles operating within the construction site. ▪ All vehicles are to remain on demarcated roads and no driving through the veld should be allowed. ▪ To advise construction staff of the requirements in respect of management of flora and fauna on site during the construction phase. Limit pedestrian/labour movement to within the confines of the site. ▪ Personnel should not be allowed to roam into the veld. ▪ Appropriate signage and environmental induction are to be carried out in order to convey this point to onsite labourers (i.e. convey acceptable areas in which to traverse within the subject site).						

▪ **Impact Management Outcomes: Maintain all activities to the designated footprint and existing roadways or built structures. Avoidance of unnecessary disturbance to site and surrounds and established buffers where required. Ensure appropriate management of alien vegetation on site. Minimize the alteration of plant communities and fossorial species.**						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
<u>Vegetation clearance</u> ▪ Clearance activities are to be strictly confined to the development footprint. Clearance is to be carried out where needed to accommodate infrastructure. ▪ Demarcate all infrastructure sites clearly to avoid unnecessary clearance of the vegetation. ▪ Vegetation clearance should be confined to the footprint of the development and unnecessary clearance should be avoided. The severity of the vegetation clearance can be mitigated if only a service road would be cleared and a vegetative ground layer would be retained in the rest of the servitude. ▪ Permits have to be obtained for the removal of Mpumalanga protected species within the footprint of the development. ▪ The ECO is to provide supervision on vegetation clearing activities and other activities that may cause damage to the environment. ▪ No plants may be translocated or otherwise uprooted or disturbed without express permission from the ECO. <u>Fauna management</u> ▪ Holes and trenches should not be left open for long periods of time. These should be regularly inspected for the presence of trapped animals before filling. ▪ Ensure that cabling and electrical infrastructure at the site are buried sufficiently deep to avoid being excavated by fauna and that where such infrastructure emerges above-ground that it is sufficiently protected from gnawing animals. ▪ Any dangerous fauna (e.g. snakes, scorpions) that are encountered during construction should not be handled or molested by construction staff and the						

▪ **Impact Management Outcomes: Maintain all activities to the designated footprint and existing roadways or built structures. Avoidance of unnecessary disturbance to site and surrounds and established buffers where required. Ensure appropriate management of alien vegetation on site. Minimize the alteration of plant communities and fossorial species.**						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
ECO (or other suitably qualified person) should be contacted to remove the animals to safety. ▪ If there is any part of the site that needs to be lit at night for security reasons, then appropriate lighting should be installed to minimise negative effects on nocturnal animals. ▪ Should electrical fences be erected it must be done according to the norms and standards of the Nature Conservation Authorities in Mpumalanga. ▪ Access to the site should be regulated to reduce the opportunities for poaching. <u>Alien Invasive Plant Species Control</u> ▪ The removal of alien vegetation through mechanical mechanisms or application of a herbicide is likely to be required in order to curtail proliferation. The appointed ECO of the project is to be consulted prior to application of the herbicide. Appoint a specialist or contractor to undertake a sweep and survey of the final development footprint site, with an alien invasive plant management team to remove exotic vegetation prior to the commencement of construction (see Appendix G). ▪ Herbicides for the control of alien species should be applied according to the relevant instructions, material safety data sheets (MSDS), and by appropriately trained personnel. ▪ No alien species should be used in rehabilitation or landscaping. ▪ Cleared areas may need to be fenced-off during rehabilitation to exclude livestock and wildlife.						

▪ **Impact Management Outcomes: Maintain all activities to the designated footprint and existing roadways or built structures. Avoidance of unnecessary disturbance to site and surrounds and established buffers where required. Ensure appropriate management of alien vegetation on site. Minimize the alteration of plant communities and fossorial species.**						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ Implement a monitoring program for the early detection of alien invasive plant species. Employ a control program to combat declared alien invasive plant species ▪ Material brought onto site e.g. building sand should be regularly checked for the germination of alien species.						
OPERATIONAL PHASE						
▪ Proper waste management procedures should be put in place. ▪ Implement a monitoring program for the early detection of alien invasive plant species and a control program to combat declared alien invasive plant species should be employed. ▪ No alien species should be used for landscaping, rehabilitation or any other purpose. ▪ Clearing of alien species should be done on a regular basis.	To be completed post EA by relevant parties					
DECOMMISSIONING PHASE						
▪ Ensure that there is appropriate disposal of materials and waste during decommissioning activities. ▪ Unnecessary clearance of natural vegetation should be avoided. ▪ Excessive dust can be reduced by spraying water onto the roads or other disturbed areas during construction activities. ▪ Areas where infrastructure are removed, must be revegetated with indigenous plant species. ▪ No alien species should be used for rehabilitation/revegetation or any other purpose.	To be completed post EA by relevant parties					

▪ **Impact Management Outcomes: Maintain all activities to the designated footprint and existing roadways or built structures. Avoidance of unnecessary disturbance to site and surrounds and established buffers where required. Ensure appropriate management of alien vegetation on site. Minimize the alteration of plant communities and fossorial species.**						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ Implement a monitoring program for the early detection of alien invasive plant species and employ a control program to combat declared alien invasive plant species. ▪ The use of structures which may inhibit movement of fauna, e.g. mesh or electric fencing should be avoided, where feasible.						

7.5 AQUATIC BIODIVERSITY

Impact Management Outcomes: Limit the disturbance of aquatic habitat; minimise potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
PLANNING AND DESIGN PHASE						
▪ The proposed layout should be reviewed during the detailed designed phase (post-EA, but prior to construction), by an environmental professional (e.g. EAP, ECO or ecological specialist) to confirm that the pylon structures have been placed outside of the delineated wetland and wetland buffer zones (as shown in mapped in Figure D.6). ▪ In terms of Government Notice 509 of 2016, where the final detailed design locates power line infrastructure (e.g. pylons, etc.) within the 500 m regulated area of a watercourse, a General Authorisation must be obtained by the EA holder for the relevant section 21 water use activity as provided in the National Water Act (Act 36 of 1998), as amended, ▪ Utilisation should be made of existing disturbed areas where possible.	To be completed post EA by relevant parties					

Impact Management Outcomes: Limit the disturbance of aquatic habitat; minimise potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ The position of the footings of the towers should be built to accommodate significant flooding and high-level flows. Access to all parts of the route during construction should be carefully demarcated with only a single access route being driven. Where turning circles are required, these should be in previously disturbed areas where possible. ▪ Ensure reduced security lighting, downward lighting and restriction on lumens employed ▪ Ensure that the Department of Water and Sanitation are consulted with to confirm the need and requirements of a Water Use Licence. The relevant requirements of the National Water Act (Act 36 of 1998, as amended) regarding water use and pollution management must be adhered to at all times. ▪ Develop an Alien Plant Control Plan which specifies actions and measurable targets (preliminary guide available in Appendix G).						
CONSTRUCTION PHASE						
<u>Demarcation of Working Area</u> ▪ For all project-related components within the site, the aquatic features of high sensitivity should be treated as no-go areas during the construction phase. ▪ A temporary fence or demarcation must be erected around the working corridors or sites prior to any construction taking place to prevent disturbance to adjacent No-Go Areas, i.e. watercourse and watercourse buffers (as mapped in Appendix D). ▪ No construction related impacts may be allowed into the watercourse i.e. water runoff from cleaning of equipment, vehicle access etc.	To be completed post EA by relevant parties					

Impact Management Outcomes: Limit the disturbance of aquatic habitat; minimise potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ Effective culverts should be incorporated into the design of access roads. <u>Waste Management and Housekeeping</u> ▪ Proper solid and liquid waste management should be undertaken within the site with facilities provided to contain waste, to dispose of waste disposal on-site and the removal of stored waste to a licensed facility that can treat/dispose of the waste. ▪ Appoint a reliable contractor for the removal of refuse during the construction phase. ▪ Provision of adequate ablution facilities for personnel; these ablution facilities should not be placed within 100m of any of any aquatic features or its associated buffer zone delineated within the site. <u>Management of spills, stormwater and pollution</u> ▪ Develop norms and practices for the treatment of hydrocarbon or chemical spills such as oil or hydraulic fluid. Ensure that the required equipment is available on hand to contain any spills. ▪ Liquid dispensing receptacles (e.g. lubricants, diesel, shutter oil etc.) must have drip trays beneath them/beneath the nozzle fixtures. Material safety data sheets (MSDS) must be available on site where products are stored so that in the event of an incident, the correct action can be taken. Depending on the types of materials stored on-site during the maintenance activities, suitable product recovery materials (such as Spillsorb or Drizit products) must be readily available. Vehicles should ideally be washed at their storage yard as opposed to on-site. ▪ Monitoring should be done to ensure that sediment pollution is timeously dressed.						

Impact Management Outcomes: Limit the disturbance of aquatic habitat; minimise potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse. ▪ Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas. ▪ Regular independent water quality monitoring should form part of operational procedures in order to identify pollution. ▪ Treatment of pollution identified should be prioritized according to best practice guidelines. ▪ Where development activities are located upslope from wetlands, effective stormwater management should be a priority during both construction and operational phase. High energy stormwater input into the watercourses should be prevented. This should be monitored as part of the EMPr. <u>Alien Invasive Plant Species Control and Rehabilitation</u> ▪ Implement the Alien Plant Control Plan which was developed in the planning and design phase. ▪ Invasive alien plant material that has been cleared should be removed from the site; ▪ Long-term monitoring for the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish, as specified in the Alien Vegetation Management Plan. ▪ Maintenance of construction vehicles/equipment should not take place within the watercourse or watercourse buffer.						

Impact Management Outcomes: Limit the disturbance of aquatic habitat; minimise potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ Monitor rehabilitation and the occurrence of erosion twice during the rainy season for at least two years and take immediate corrective action where needed. ▪ Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction/earthworks in that area and returning it where possible afterwards. ▪ Rehabilitation of any the disturbed areas within the aquatic features and the recommended buffer areas should be undertaken immediately following completion of the disturbance activity according to rehabilitation measures as included in a method statement for that specific activity as described above; ▪ Operational activities should not impact on rehabilitated or naturally vegetated areas.						
OPERATIONAL PHASE						
<u>General</u> ▪ Operational activities should not take place within watercourses or buffer zones, nor should edge effects impact on these areas. <u>Waste Management and Housekeeping</u> ▪ Appoint a reliable contractor for the removal of refuse during the operational phase. ▪ Provision of adequate ablution facilities for personnel; these ablution facilities should not be placed within 100m of any of any aquatic features or its associated buffer zone delineated within the site.	To be completed post EA by relevant parties					

Impact Management Outcomes: Limit the disturbance of aquatic habitat; minimise potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
<u>Management of spills, stormwater and pollution</u> ▪ Develop norms and practices for the treatment of hydrocarbon or chemical spills such as oil or hydraulic fluid. Ensure that the required equipment is available on hand to contain any spills. ▪ Control waste discharges and do not allow wastewater from operational activities to enter the watercourse. ▪ Effective culverts should be incorporated into the design of access roads. ▪ Maintenance of construction vehicles/equipment should not take place within the watercourse or watercourse buffer. ▪ Monitoring should be done to ensure that sediment pollution is timeously dressed. ▪ Treatment of pollution identified should be prioritized according to best practice guidelines. ▪ Ongoing monitoring of the structures, in particular before the rainfall period, should be undertaken to ensure that the integrity of the structures is intact and that they are not blocked with debris. Ongoing monitoring post large rainfall events should also be undertaken to identify and address any erosion occurring within the watercourses. ▪ Regular independent water quality monitoring should form part of operational procedures in order to identify pollution. ▪ Where development activities are located upslope from wetlands, effective stormwater management should be a priority during both construction and operational phase. This should be monitored as part of the EMPr.						

Impact Management Outcomes: Limit the disturbance of aquatic habitat; minimise potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
<u>Alien Invasive Plant Species Control and Rehabilitation</u> ▪ Implement the Alien Plant Control Plan which was developed in the planning and design phase. ▪ Invasive alien plant material that has been cleared should be removed from the site; ▪ Long-term monitoring for the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish, as specified in the Alien Vegetation Management Plan. ▪ Operational activities should not impact on rehabilitated or naturally vegetated areas. ▪ Monitor rehabilitation and the occurrence of erosion twice during the rainy season for at least two years and take immediate corrective action where needed.						
DECOMMISSIONING PHASE						
<u>Demarcation of Working Area</u> ▪ For all project-related components within the site, the aquatic features of high sensitivity should be demarcated by the appointed ECO before the commencement of the decommissioning activities and treated as no-go areas during the decommissioning phase. ▪ Ensure that no decommissioning activities impact on the watercourse or buffer area. This includes edge effects.	To be completed post EA by relevant parties					

Impact Management Outcomes: Limit the disturbance of aquatic habitat; minimise potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
<u>Waste Management and Housekeeping</u> ▪ Appoint a reliable contractor for the removal of refuse during the decommissioning phase. ▪ Ensure that there is appropriate disposal of materials and waste. ▪ Provision of adequate ablution facilities for personnel; these ablution facilities should not be placed within 100m of any of any aquatic features or its associated buffer zone delineated within the site. <u>Management of spills, stormwater and pollution</u> ▪ Control of waste discharges and do not allow dirty water from decommissioning activities to enter the watercourse. ▪ Culverts must remain in place and must not removed if the given road is not removed during the decommissioning phase. ▪ Develop norms and practices for the treatment of hydrocarbon or chemical spills such as oil or hydraulic fluid. Ensure that the required equipment is available on hand to contain any spills. ▪ Maintenance of construction vehicles/equipment should not take place within the watercourse or watercourse buffer. ▪ Vehicle movement should be restricted to the minimum that is required for decommissioning. Unnecessary movement of vehicles will increase the degradation of paths and dirt roads leading to increased hardened surfaces (compaction) and consequent erosion risk. ▪ Monitoring should be done to ensure that sediment pollution is timeously dressed. ▪ Treatment of pollution identified should be prioritized according to best practice guidelines.						

Impact Management Outcomes: Limit the disturbance of aquatic habitat; minimise potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ Regular independent water quality monitoring should form part of decommissioning procedures in order to identify pollution. <u>Alien Invasive Plant Species Control and Rehabilitation</u> ▪ Implement the Alien Plant Control Plan which was developed in the planning and design phase. ▪ Monitor the establishment of alien invasive species within the areas affected by the decommissioning and take immediate corrective action where invasive species are observed to establish. ▪ Invasive alien plant material that has been cleared should be removed from the site; ▪ Long-term monitoring for the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish, as specified in the Alien Vegetation Management Plan. ▪ Progressive rehabilitation must occur. Rehabilitation has to be take place as soon as decommissioning commences to prevent soil erosion. ▪ Rehabilitation of any disturbed areas within the aquatic features and the recommended buffer areas should be undertaken immediately following completion of the disturbance activity according to rehabilitation measures as included in a method statement for that specific activity. ▪ A mixture of indigenous vegetation seed must be used during rehabilitation. The mix must include: Annual and perennial species, pioneer species. These species must be indigenous to the area to ensure there is no ecological imbalance in the area.						

Impact Management Outcomes: Limit the disturbance of aquatic habitat; minimise potential for erosion. Limit the potential for contamination/pollution of aquatic ecosystems.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ Monitor rehabilitation and the occurrence of erosion twice during the rainy season for at least two years and take immediate corrective action where needed. ▪ Decommissioning activities should not impact on rehabilitated or naturally vegetated areas.						

7.6 AVIFAUNA IMPACTS

Impact Management Outcomes: Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the Construction Environmental Management Programme (CEMPr.) Prevent bird collisions with the 132 kV power lines						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
CONSTRUCTION PHASE						
▪ A site-specific CEMPr must be implemented, which gives appropriate and detailed description of how construction activities must be conducted. All contractors are to adhere to the CEMPr and should apply good environmental practice during construction. The CEMPr must specifically include the following: o Activity should be restricted to a working corridor as close as possible to the footprint of the infrastructure. o Vegetation clearance should be limited to what is absolutely necessary. o Driving restricted to authorised roads;	To be completed post EA by relevant parties					

Impact Management Outcomes: Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the Construction Environmental Management Programme (CEMPr.) Prevent bird collisions with the 132 kV power lines						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
○ Measures to control noise and dust should be applied according to current best practice in the industry. ○ Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum as far as practical. ○ Access to the rest of the property must be restricted. ○ Strict application of all recommendations in the biodiversity specialist report pertaining to the limitation of the footprint. ▪ Entire power line to be fitted with Eskom approved Bird Flight Diverters (BFDs).						
OPERATIONAL PHASE						
▪ Appointment of rehabilitation specialist to develop a Habitat Restoration Plan (HRP) and ensure that it is approved. ▪ Monitor rehabilitation yearly via site audits and site inspections to ensure compliance. Record and report any non-compliance. ▪ Implement adaptive management to ensure HRP goals are met. ▪ Ensure that BFDs are maintained throughout the operational phase.	To be completed post EA by relevant parties					
DECOMMISSIONING PHASE						
▪ A site-specific Decommissioning EMPr (DEMPr) must be implemented, which gives appropriate and detailed description of how activities must be conducted. All contractors are to adhere to the DEMPr and should apply good environmental practice during decommissioning. The DEMPr must specifically include the following:	To be completed post EA by relevant parties					

Impact Management Outcomes: Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the Construction Environmental Management Programme (CEMPr.) Prevent bird collisions with the 132 kV power lines						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
○ Activity should be restricted to a working corridor as close as possible to the footprint of the infrastructure. ○ Vegetation clearance should be limited to what is absolutely necessary. ○ No off-road driving and ensure that decommissioning personnel are made aware of the impacts relating to off-road driving; ○ Measures to control noise and dust should be applied according to current best practice in the industry. ○ Maximum use should be made of existing access roads during the decommissioning phase and the construction of new roads should be kept to a minimum as far as practical. ○ Restricted access to the rest of the property. Decommissioning area must be demarcated clearly and personnel must be made aware of these demarcations. Monitor via monthly site inspections and report non-compliance; ○ Strict application of all recommendations in the botanical specialist report pertaining to the limitation of the footprint.						

7.7 GENERIC MANAGEMENT ACTIONS TO SUPPLEMENT APPENDIX E OF THIS EMPR

Impact Management Outcomes: Ensure overall best practice is achieved.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
CONSTRUCTION PHASE						
▪ Ensure that the temporary site camp and ablution facilities are established at least 32 m away from the banks of the major drainage lines. The sensitivities captured in the sensitivity map included in Appendix D of this EMPr must also be considered when placing the site camp (the buffers assigned to water courses should also be avoided, where possible in this regard). ▪ Ensure that there is no ad-hoc and indiscriminate crossing of watercourses and channels by vehicles during the construction phase. Access routes across the site should be strictly demarcated and selected with a view to minimise impacts on drainage lines. Watercourses where no construction activities are proposed must be considered as no-go areas. ▪ Ensure that adequate containment structures are provided for the temporary storage of liquid dangerous goods and hazardous materials on site (such as chemicals, oil, fuel, hydraulic fluids, lubricating oils etc.). Appropriate bund areas must be provided for the storage of these materials at the site camp. Leak detection monitoring systems must be implemented. ▪ Record and report all significant fuel, oil, hydraulic fluid or electrolyte spills or leaks so that appropriate clean-up measures can be implemented. A copy of these records must be made available to authorities on request throughout the project lifecycle. ▪ The National Department of Forestry, Fisheries and the Environment, and the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs are to be immediately duly notified of any incident in terms of Section 30 of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA). In terms of Section 30 of NEMA, an “incident”	To be completed post EA by relevant parties					

Impact Management Outcomes: Ensure overall best practice is achieved.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
means an unexpected, sudden and uncontrolled release of a hazardous substance, including from a major emission, fire or explosion, that causes, has caused or may cause significant harm to the environment, human life or property. ▪ The Department of Human Settlements, Water and Sanitation must be immediately notified of any pollution to surface water or groundwater resources due to the proposed project activities. ▪ Portable chemical toilet/s (ablution facilities) at the construction camp, must be serviced weekly for the duration of the construction phase by an appropriately licensed service provider. ▪ Care should be taken with the installation of conservancy tanks to prevent cracks that could lead to leaks over time. Proper and regular servicing must be scheduled to prevent possible groundwater contamination. ▪ Ensure that regular audits (i.e. twice weekly) of water systems and all water-related infrastructure (e.g. pipes, pumps, reservoirs, toilets, taps, etc.) are conducted to identify possible water leakages. Such infrastructure must be immediately repaired. ▪ Ensure that the contact details of the local municipality, Eskom and emergency response officials, such as the police and fire department are kept on file and clearly sign-posted on site (and, where possible, at key locations along the EGI corridor). ▪ Ensure that an open communication strategy is created and maintained between the Project Developer, Contractor and owners (or managers) of the adjacent farms where hunting takes place in order to ensure that the Project Developer and Contractor are made aware of planned hunts. ▪ Ensure that construction personnel are made aware of the planned hunts and are trained on the necessary protocols to be taken.						

Impact Management Outcomes: Ensure overall best practice is achieved.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ Any signs of bird collisions / fatalities are to be recorded during the construction phase ▪ An Environmental File is to be created by the EA holder or the contractor and be situated within the site camp throughout the construction phase and with the EA holder thereafter. The environmental file is to include the following: o Copies of all approvals, including: Environmental Authorization, Water Use Licence and any other license/permit/approval. o A copy of the approved EMPr o Copies of waste disposal slips o Disposal slips or cleaning/servicing slips for ablution facilities (i.e. chemical toilets) o All EMR's (Environmental Monitoring Reports) and ECO instructions o Copies of Environmental Induction Registers o A Complaints Register o Updated method statements o Material Safety Data Sheets (MSDS) for all hazardous substances utilised on site. o Copies of audit reports o An Incident Register o Copies of purchase orders for rehabilitation material etc.						
OPERATIONAL PHASE						
▪ Ensure that the relevant construction mitigation and management measures are adhered to during the operation phase.	To be completed post EA by relevant parties					

Impact Management Outcomes: Ensure overall best practice is achieved.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
DECOMMISSIONING PHASE						
▪ Ensure that the relevant construction mitigation and management measures are adhered to during the decommissioning phase.	To be completed post EA by relevant parties					

8 APPENDIX A – CV OF THE EAP & CO-AUTHOR

CV OF PAUL LOCHNER

Name of firm	CSIR
Name of staff	Paul Lochner
Profession	Environmental Assessment and Management
Position in firm	Manager: CSIR Environmental Management Services
Nationality	South African

Biographical Sketch

Paul Lochner is an environmental assessment practitioner (EAP) at the CSIR in Stellenbosch, with more than 28 years of experience in a wide range of environmental assessment and management studies. Paul commenced work at CSIR in 1992, after completing a B.Sc. degree in Civil Engineering and a Masters in Environmental Science, both at the University of Cape Town. His initial work at focused on wetlands and estuarine management; environmental engineering in the coastal zone; and coastal zone management plans. Since 2008, Paul has been the leader and manager of the Environmental Management Services (EMS) group within CSIR that has been at the forefront of advancing environmental assessment in South Africa. This group currently consists of approximately 10 to 20 environmental scientists, planners and engineers, with offices in Stellenbosch, Cape Town and Durban. Paul's particular experience is in environmental planning and assessment for renewable energy, electricity grid infrastructure, desalination, oil & gas, wetlands & coastal zone management, and industrial & port development. He has been closely involvement in the research and application of Strategic Environmental Assessment (SEA) in South Africa, and also has wide experience in Environmental & Social Impact Assessment, Environmental Management Programmes (EMPRs) and Environmental Screening Studies. He has been the project leader for over 40 SEAs and EIAs over the past 28 years. He also served as project leader for a suite of SEAs commissioned by the DFFE from 2014 to 2020. Paul is a Registered EAP (2019/745) with the Environmental Assessment Practitioners Association of South Africa (EAPASA).

Tertiary Education

Year	Degree	Institution
1992	MPhil in Environmental Science	University of Cape Town
1990	BSc in Civil Engineering awarded with Honours	University of Cape Town

Professional Registration

- Environmental Assessment Practitioners Association of South Africa (EAPASA), Registration Number 2019/745
- Member of the International Association for Impact Assessment South Africa (IAIAsa)

Employment Record

Period	Employer	Position
1992 - current	CSIR (Stellenbosch)	Environmental scientist
2008 – current	CSIR (Stellenbosch)	Group Leader

List of Key Project Experience

Date	Project Description	Role	Client
2022-ongoing	**Review of permitting and governance** for the Mogalakwena Mine, Limpopo	Project leader	Anglo American Platinum
2021-ongoing	**Advisory services for environmental permitting** for Anglo American's Carbon Neutrality and Smart Power projects in South Africa, Namibia, Botswana and Zimbabwe	Project leader	Anglo American Platinum
2021-ongoing	**Permitting strategy for innovative pilot projects** for the Mogalakwena platinum mine	Project leader	Anglo American Platinum
2022	**Opportunities and constraints analysis for offshore wind potential for South Africa -** inventory and collation of spatial data	Project leader	World Bank
2021-2022	**Environmental assessment training and support** to provincial government in the independent power producer sector in the Eastern Cape province	Project leader	Dept of Economic Development, Environmental Affairs & Tourism, Eastern Cape
2021	**Renewable Energy Feasibility Plan** for the Atlantis Special Economic Zone, Cape Town	Lead co-leader	Atlantis Special Economic Zone
2021	**Basic Assessment** for 1350 MW Aardvark solar PV facilities near Copperton	Project leader	ABO Wind
2020-2021	**Basic Assessments** for 1575 MW Solar Photovoltaic Facilities and associated Electrical Grid Infrastructure near Touws River, Western Cape	Project leader	Veroniva
2019	Independent Expert review of the ecology study as part of the EIA and EMPR for diamond prospecting at Bloemhof Dam Nature Reserve, North West province	Independent reviewer	DEA Appeals Office
2018-2019	Greater Saldanha Bay Strategic Environmental Assessment (SEA): Phase 1 Monitoring and Decision Support System	Project leader	Western Cape provincial government
2018-2019	Environmental Screening Study for a proposed 100 to 150 megalitre/day desalination facility for City of Cape Town, Phase 1: Pre-feasibility study	Project co-leader	City of Cape Town and iX Engineers
2018-2019	EIA for 150 MW wind power project in Ghana	Proposal and EIA Quality Assurance	Volta River Authority and Seljen Consult Ltd
2019	Environmental Assessment for the Kenhardt solar PV facility and electrical infrastructure (100 MW x 3), Northern Cape	Project leader	Scatec Solar Africa (Pty) Ltd
2017-2019	SEA for Wind & Solar Photovoltaic Energy development in South Africa (Phase 2)	Project reviewer	DEA & national Dept of Energy (DOE)
2017-2019	SEA for the Expansion of EGI Corridors in South Africa	Project reviewer	DEA, DOE, iGas, Eskom (national electricity utility)
2017-2019	SEA for Energy Corridors and development of a gas pipeline network for South Africa	Project reviewer	DEA, DOE, iGas, Eskom (national electricity utility)
2017-2019	SEA for Aquaculture Development in South Africa (marine and freshwater)	Project leader	DEA and national Dept of Agriculture Forestry and Fisheries (DAFF)
2018	Environmental Assessments for the Vryburg Solar project (115 MW x 3) in the Vryburg Renewable Energy Development Zone (REDZ)	Co-project manager and co-author	Veroniva & Scatec
2018	EIA for West Bank Waste Water Treatment works marine outfall pipeline, East London	Independent reviewer	WSP and Buffalo City Municipality
2017-2018	Site selection and environmental screening for a proposed 120 – 150 ML/day desalination plant for the City of Cape Town	Project leader	City of Cape Town and iX Engineers

Date	Project Description	Role	Client
2017-2018	EIA and EMP for Icyari Coltan Mine, Rwanda	Project reviewer	Mawarid Mining Rwanda Ltd (MMRL), UAE
2016-2017	SEA for the Square Kilometre Array radio-telescope in the Karoo, South Africa	Project leader	DEA and DST
2016-2017	SEA for Shale Gas Development in the Karoo region of South Africa	Project co-leader	DEA and other government departments
2015-2016	SEA for the development of Electrical Grid Infrastructure for South Africa	Project leader	DEA and Eskom (national electricity utility)
2017	EIA for the 75 MW x 12 solar photovoltaic energy projects near Dealesville, Free State	Project leader	Mainstream Renewable Power SA
2014-2015	EIA for Ishwati Emoyeni 140 MW wind energy project and supporting electrical infrastructure at Murraysburg, Western Cape	Project leader	Windlab South Africa
2012-2015	SEA for identification of renewable energy zones for wind and solar photovoltaic projects in South Africa	Project leader	DEA and other national government departments
2012-2013	Environmental Screening Study (ESS) for a desalination plant for the City of Cape Town	Project leader	City of Cape Town & WorleyParsons
2012-2013	EIA for the desalination plant for the Saldanha area	Project leader	West Coast District Municipality & WorleyParsons
2012-2013	EIA for the manganese export terminal at the Port of Ngqura and Coega Industrial Development Zone (IDZ)	Project leader	Transnet
2011 – 2012	EIA (x2) for 100 MW solar photovoltaic project at Blocuso and 100 MW solar PV project at Roode Kop in the Northern Cape	Project leader	Mainstream Renewable Power
2011 – 2012	EIA (x2) for 75 MW solar photovoltaic project at GlenThorne and 75 MW project at Valleydora, in the Free State	Project leader	Solaire Direct
2010-2011	More than 10 Basic Environmental Assessments (BAs) for solar photovoltaic projects in the Western Cape, Northern Cape, Eastern Cape and Free State	Project leader	Conducted for Dutch, German, French and South African companies
2010/2011	EIA for a 100 MW wind project at Zuurbron and a 50 MW wind project Broadlands in the Eastern Cape	Project leader	WindCurrent SA (German-based company)
2010-2011	EIAs (x4) for the proposed InnoWind wind energy projects near Swellendam, Heidelberg, Albertinia and Mossel Bay (totalling approx 210 MW), Western Cape, South Africa	Project leader	InnoWind South Africa (Pty) Ltd
2009-2010	EIA for the proposed Electrawinds wind energy facility of 45-75 MW capacity in the Coega IDZ, Eastern Cape	Project leader	Electrawinds N.V. (Belgium)
2009-2010	EIA for proposed 180 MW Jeffreys Bay wind energy project, Eastern Cape	Project Leader and co-author	Mainstream Renewable Power South Africa
2009-2010	EIA for the proposed 70 megalitre/day desalination plant at Mile 6 near Swakopmund, Namibia	Project leader	NamWater, Namibia
2009	ESS for a proposed Deepwater Port, Container Hub and Industrial Development Zone, Ghana	Project Manager	Project Management International Pty Ltd
2009	EMP for the Operational Phase of the Berg River Dam, Franschoek, South Africa	Project leader and report co-author	TCTA (national water supply utility), South Africa
2006	Environmental Impact Assessment (EIA) for extension of Port of Ngqura, Eastern Cape	Project Leader and co-author	Transnet National Port Authority
2004-2005	Environmental and Social Impact Assessment (ESIA) report for the proposed alumina refinery near Sosnogorsk, Komi Republic, Russia	Project manager and co-author	Komi Aluminium Russia, IFC, European Bank for

Date	Project Description	Role	Client
			Reconstruction & Development (EBRD)
2005	Guideline for Environmental Management Plans (EMPs) for the Western Cape province	Author	Dept of Environmental Affairs & Development Planning, Western Cape
2003	Environmental Management Plan for the Operational Phase of the wetlands and canals at Century City, Cape Town	Project leader and lead author	Century City Property Owners' Association
2002	Environmental Impact Assessment for the proposed Pechiney aluminium smelter at Coega, South Africa	Project Manager and lead author	Pechiney, France
1999-2000	Cape Action Plan for the Environment: a biodiversity Strategy and Action Plan for the Cape Floral Kingdom - legal, institutional, policy, financial and socio-economic component	Project manager and contributing writer	World Wide Fund for Nature (WWF): South Africa and Global Environment Facility (GEF)
1999	Management Plan for the coastal zone between the Eerste and Lourens River, False Bay, South Africa	Project manager and lead author	Heartland Properties and Somchem (a Division of Denel)
1998	Environmental Assessment of the Mozal Matola Terminal Development proposed for the Port of Matola, Maputo, Mozambique	Project manager and author	SNC-Lavalin-EMS
1996-1997	Strategic Environmental Assessment (SEA) for the proposed Industrial Development Zone and Harbour at Coega, Port Elizabeth, South Africa	SEA project manager and report writer	Coega IDZ Initiative Section 21 Company
1995-1996	Environmental Impact Assessment and EMP for Development Scenarios for Thesen Island, Knysna, South Africa	Project manager and report writer	Thesen and Co.
1996	Environmental Impact Assessment for the Blouvlei wetlands at Century City, Cape Town	Project manager and report writer	Ilco Homes Ltd (now Monex Ltd)
1995	Environmental Impact Assessment for the Saldanha Steel Project, South Africa	Report author and project manager	Saldanha Steel Project
1994	Environmental Impact Assessment for the upgrading of resort facilities on Frégate Island, Seychelles	Project management, co-author, process facilitator	Schneid Israelite and Partners
1994	Environmental Impact Assessment for exploration drilling in offshore Area 2815, Namibia	Project manager and lead author	Chevron Overseas (Namibia) Limited
1994	Management Plan for the Rietvlei Wetland Reserve, Cape Town	Project manager and lead author	Southern African Nature Foundation (now WWF-SA)

Recent Journal Publications and Peer Reviewed Papers

A comprehensive list of publications is available on request, with a summary provided below of recent journal publications, book chapters and peer reviewed conference papers:

Fischer D, Lochner P and Annergarn H, 2019. Evaluating the effectiveness of Strategic Environmental Assessment to facilitate renewable energy planning and improved decision-making: a South African case study, *Impact Assessment and Project Appraisal* - article ID: IAPA 1619389.

Cape L., Retief F., Lochner P., Fischer T., and Bond A., 2018. Exploring pluralism: Different stakeholder views of the expected and realised value of strategic environmental assessment (SEA). *Environmental Impact Assessment Review*, Volume 69, March 2018, Pages 32-41.

Cape L., Lochner P. and Fischer D., 2017. SEAs for major infrastructure programmes in SA. *IAIA17 Conference Proceedings* - 37th Annual Conference of the International Association for Impact Assessment, 4-7 April 2017 | Le Centre Sheraton Montreal | Montreal | Canada | www.iaia.org

Schreiner, G.O., Scholes, R.J., Snyman-Van der Walt, L., De Jager, M., S, Esterhuyse., Dludla, A., Lochner, P.A., Wright, J., Atkinson, D., Hardcastle, P., Kotze, H. 2017. Advancing a participatory and science-based approach to policy formulation for shale gas development in South Africa. *In:* Eds Whitton, J., Cotton, M., Brasier, K. 2017. *Citizen and other stakeholder participation in unconventional fossil fuel land use decision-making, policy formation, regulatory practice or other governance mechanisms*. London: Routledge.

Lochner P, Mabin M & Cape L, 2015, Recent Strategic Environmental Assessment experience in South Africa and national principles, in *IAIA16 (Japan) Conference Proceedings*.

Language Capabilities

	Speaking	Reading	Writing
English	Excellent	Excellent	Excellent
Afrikaans	Average	Average	Average

CV OF WILLAN ADONIS

Full Name:	Willan Adonis
Nationality:	South African
Current employer:	CSIR Environmental Management Services
Position in Firm:	Environmental Consultant in training
Specialisation and Research interest:	Geographic Information Systems; Spatial Analysis; Environmental Assessment and Management; Environmental Governance; Social and Economic systems; Systems Thinking.

BIOSKETCH

Willan Adonis is an environmental consultant in training in the CSIR's EMS group. Willan holds a BA, a PGDip and an MPhil (all cum laude) in Development and Environmental Management from Stellenbosch University. After completing his masters, he gained experience in on-site compliance monitoring, assisted with BA reports, compiled EMPRs, and undertook several public participation processes. His key interest lies in how the multi-disciplinary interfaces between Environmental, Social and Governance systems can be used to build stakeholder partnerships and promote sustainable human-environment relationships.

EMPLOYMENT RECORD

Name of current employer	Position	From	To
Council for Scientific and Industrial Research : Environnemental Management Services (CSIR EMS)	Environmental Consultant in training	Jul 2022	Present
Stellenbosch University's School of Public Leadership	Module administrator and research assistant	2018	Jul 2022
Sharples Environmental Services (SES.cc)	Intern	Jan 2022	Jun 2022
Tomorrow Matters Now (TOMA-Now) & Western Cape Government	Assistant	Sep 2018	-

COMMUNITY SERVICE

Organisation	Position	From	To
Rotaract Bellville	Board member (environmental champion)	Mar 2021	Present
Cape Town Junior City Council	Junior councillor	2013	2015

QUALIFICATIONS

Qualification	Institution	Year
M. Phil. Environmental Management (*Cum laude*)	Stellenbosch University	2021
PGD Environmental Management (*Cum laude*)	Stellenbosch University	2019
BA Development and Environment (*Cum laude*)	Stellenbosch University	2018

SOFTWARE SKILLS

- ArcGIS Pro
- Microsoft Office (Word, Excel, PowerPoint, Outlook, Teams, OneNote)
- Google Earth
- QGIS
- ATLAS.ti

PROFESSIONAL AFFILIATIONS/REGISTRATIONS

• International Association of Impact Assessment South Africa (Member no. 7104)	2022-present

HONOURS AND AWARDS

• Harry Crossley Fellow	Harry Crossley Foundation	2020-2021
• Research Fellow	ASSET Research	2020-2021
• GreenMatter ZA Fellow	GreenMatter ZA	2019
• Golden Key International Honour Society	Golden Key International	2016
• SU First Year Achievement Award	Stellenbosch University	2016
• SP Cilliers Award for Top Achievement in Sociology	Stellenbosch University	2016
• Special Award for Environmental Commitment	Fairmont High School	2015
• Good Fellowship Prize	Fairmont High School	2015
• Full Academic Colours	Fairmont High School	2014

CONFERENCE PRESENTATIONS

- **Adonis, W.** 2022. "Institutional Healing, Restoring the Kuils River" at ASSET Research Symposium, March 14, Stellenbosch Institute for Advanced Study (STIAS).

LANGUAGE CAPABILITY

	Speaking	Reading	Writing
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

PROJECT TRACK RECORD

Completion/ Year	Description	Role (consultancy)	Client
In process	Basic Assessment Process for the Proposed Development of a 132 kV Overhead Power Line and Supporting Infrastructure for the Proposed Vhuvhili Solar Photovoltaic Energy Facility, near Secunda in the Mpumalanga Province.	Project Officer (CSIR EMS)	Vhuvhili Solar RF (Pty) Ltd
In process	National Foundry Technology Network (NFTN) Foundries Phase 2 Environmental Compliance Study.	Project Officer (CSIR EMS)	Department of Trade Industry and Competition
In process	Permitting Governance: Gap Analysis, Permitting Review and Recommendations Report.	Project Officer (CSIR EMS)	Undisclosed (NDA)

Completion/ Year	Description	Role (consultancy)	Client
2022	Environmental compliance monitoring of Baden Powell bulk water pipeline development.	Assistant ECO (SES.cc)	City of Cape Town Metropolitan Municipality
2022	Section 24G process for unauthorised commencement of hazardous goods storage.	Project Officer (SES.cc)	Narcross Group
2022	Basic Assessment Process for The Proposed Construction of a Housing Development and Associated Infrastructure in Aalwyndal, Mossel Bay Local Municipality, Western Cape.	Project Officer (SES.cc)	Catfight Properties 1313 cc
2022	Basic Assessment Process for The Proposed Development of a Storage Facility and Associated Infrastructure in Aalwyndal, Mossel Bay Local Municipality, Western Cape.	Project Officer (SES.cc)	Mossel Bay Storage (Pty) Ltd
2022	Basic Assessment Process for The Proposed Expansion of an Agricultural Chemicals Storage Facility in Paarl, Drakenstein Local Municipality, Western Cape.	Project Officer (SES.cc)	Nexus AG (Pty) Ltd
2022	Basic Assessment Process for the Proposed Establishment of a Crematorium Facility in Montague Gardens, City of Cape Town Metropolitan Municipality, Western Cape.	Project Officer (SES.cc)	Platinum Pride Crematorium
2022	Registration in terms of the National Norms and Standards for Organic Waste Composting (GN R. 561 of 2021) under the National Environmental Management: Waste Act (Act 59 of 2008).	Project Lead (SES.cc)	Grow Green Organics (Pty) Ltd
2022	Basic Assessment Process for the Proposed Establishment of a Compositing, Nursery and Tourism Facility in George Local Municipality, Western Cape.	Project Officer (SES.cc)	Grow Green Organics (Pty) Ltd
2022	Basic Assessment Process for the Proposed Upgrade to the Bulk Water Infrastructure in Kurland, Bitou Local Municipality, Western Cape.	Project Officer (SES.cc)	Bitou Local Municipality
2022	Scoping and Environmental Impact Assessment Process for the Proposed Kurland Housing Development in Kurland, Bitou Local Municipality, Western Cape.	Project Officer (SES.cc)	Bitou Local Municipality
Authorised	Scoping and Environmental Impact Assessment Process for the Proposed Tertiary Education and Mixed-use Precinct Development and Associated Infrastructure at the Garden Route Dam in George Local Municipality, Western Cape.	Public Participation Officer (SES.cc)	George Local Municipality

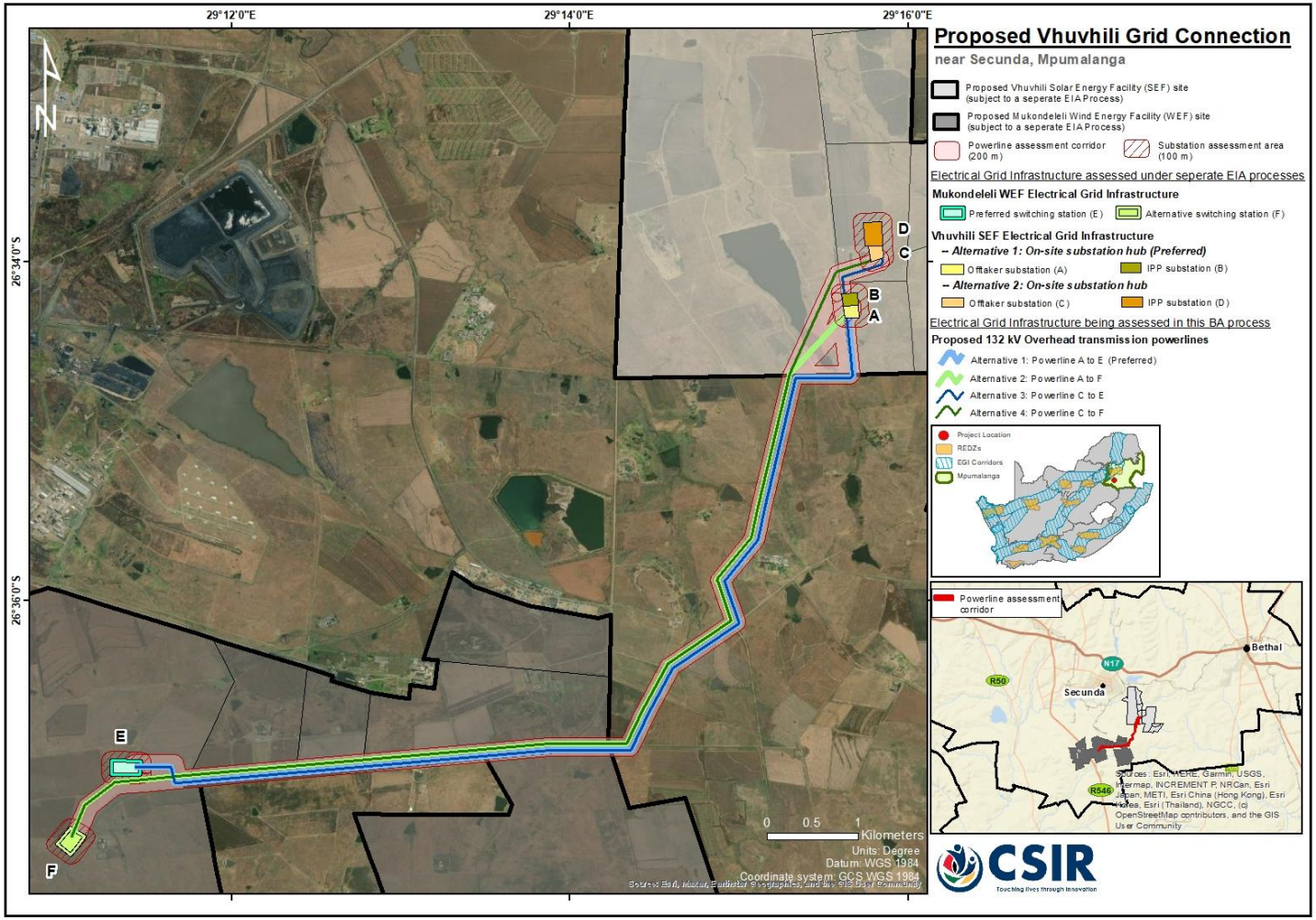
9 APPENDIX B – ROLES AND RESPONSIBILITIES

Responsible Person(s)	Role and Responsibilities
Developer's Project Manager (DPM) or Project Developer **In the Vhuvhili project, this is also referred to as the Project Owner.** **During the Operational Phase, the owner is referred to as the Facilities Manager.**	Role The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). Where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation, and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent. Responsibilities - Be fully conversant with the conditions of the EA; - Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s); - Issuing of site instructions to the Contractor for corrective actions required; - Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings. Overall management of the project and EMPr implementation; and - Ensure that periodic environmental performance audits are undertaken on the project implementation.
Developer Site Supervisor (DSS) **In the Vhuvhili project, this is also referred to as the Project Owner's Site Supervisor**	Role The DSS reports directly to the DPM, oversees site works, liaises with the contractor(s) and the ECO. The DSS is responsible for the day to day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMPr. Responsibilities - Ensure that all contractors identify a contractor's Environmental Officer (cEO); - Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM and ECO; - Must ensure that all landowners have the relevant contact details of the site staff, ECO and cEO; - Issuing of site instructions to the Contractor for corrective actions required; - Will issue all non-compliances to contractors; and - Ratify the Monthly Environmental Report.
Environmental Control Officer (ECO) **The independent ECO reports to the Project Owner.**	Role The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. The ECO provides feedback to the DSS and Project Manager regarding all environmental matters. The Contractor, cEO and dEO are answerable to the Environmental Control Officer for non-compliance with the Performance Specifications as set out in the EA and EMPr. The ECO provides feedback to the DSS and Project Manager, who in turn reports back to the Contractor and potential and Registered Interested &Affected Parties' (RI&AP's), as required. Issues of non-compliance raised by the ECO must be taken up by the Project Manager, and resolved with the Contractor as per the conditions of his contract. Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the Project Manager. The ECO must also, as specified by the EA, report to the relevant CA as and when required.

Responsible Person(s)	Role and Responsibilities
	Responsibilities The responsibilities of the ECO will include the following: - Be aware of the findings and conclusions of all EA related to the development; - Be familiar with the recommendations and mitigation measures of this EMPr; - Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them; - Undertake regular and comprehensive site inspections / audits of the construction site according to the generic EMPr and applicable licenses in order to monitor compliance as required; - Educate the construction team about the management measures contained in the EMPr and environmental licenses; - Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective; - Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements; - In consultation with the Developer Site Supervisor order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses; - Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns; - Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr; - Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO); - Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc.) as well as corrective and preventive actions taken; - Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken; - Assisting in the resolution of conflicts; - Facilitate training for all personnel on the site – this may range from carrying out the training, to reviewing the training programmes of the Contractor; - In case of non-compliances, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance; - Maintenance, update and review of the EMPr; - Communication of all modifications to the EMPr to the relevant stakeholders.
developer Environmental Officer (dEO) **In the Vhuvhili project, this is also referred to as the Project Owner's Environmental Officer**	Role The dEOs will report to the Project Manager and are responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities. Responsibilities - Be fully conversant with the EMPr; - Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures; - Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s) ; - Confine the development site to the demarcated area; - Conduct environmental internal audits with regards to EMPr and authorisation compliance (on cEO); - Assist the contractors in addressing environmental challenges on site; - Assist in incident management: - Reporting environmental incidents to developer and ensuring that corrective action is taken, and lessons learnt shared; - Assist the contractor in investigating environmental incidents and compile investigation reports;

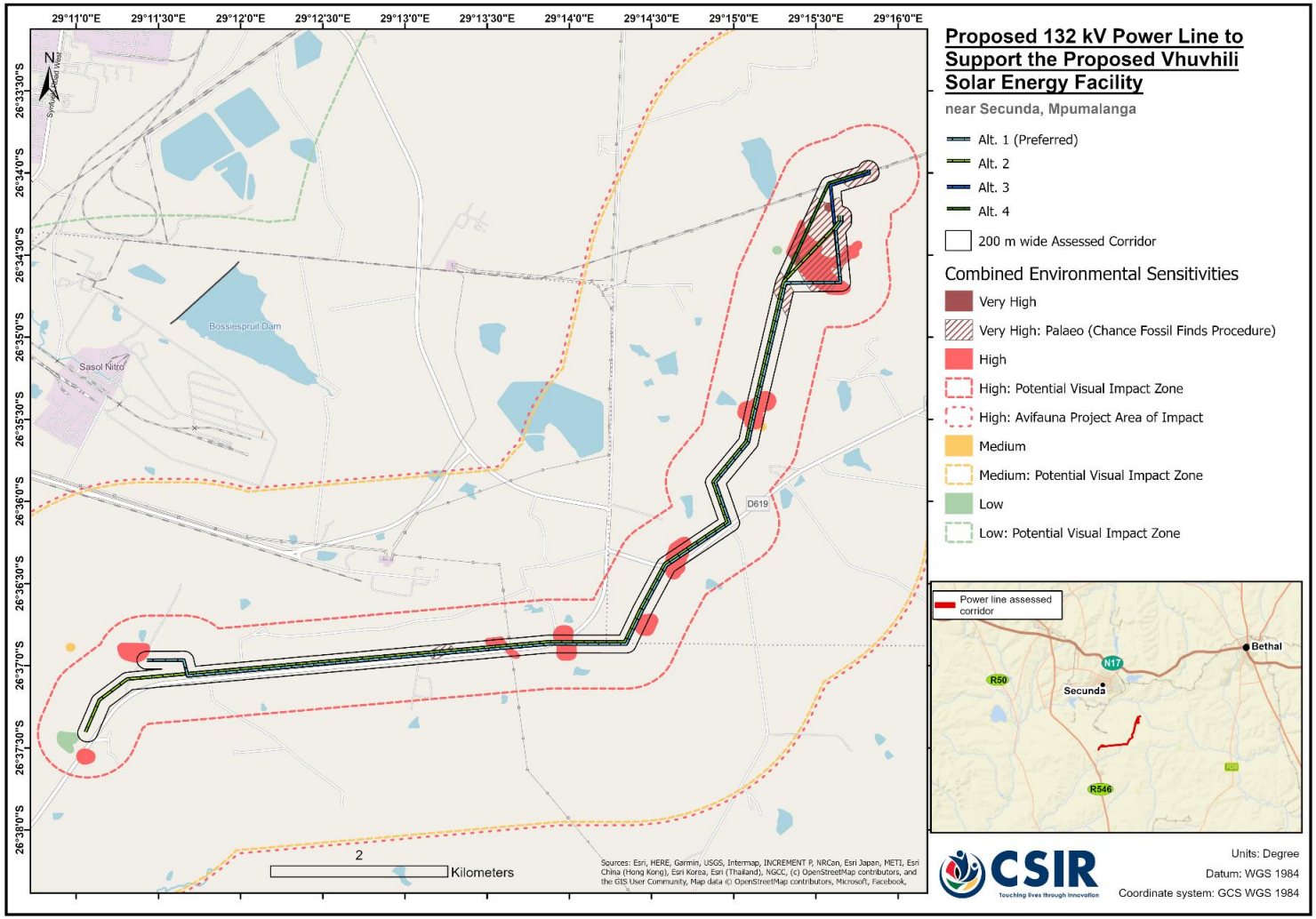
Responsible Person(s)	Role and Responsibilities
	- Follow-up on pre-warnings, defects, non-conformance reports; - Measure and communicate environmental performance to the Contractor; - Conduct environmental awareness training on site together with ECO and cEO; - Ensure that the necessary legal permits and / or licenses are in place and up to date; - Acting as Developer's Environmental Representative on site and work together with the ECO and contractor;
Contractor **In the Vhuvhili project, this is also referred to as the Engineering, Construction and Procurement (EPC) Contractor.** **In the Operations phase, the contractor responsible for the Vhuvhili facility and associated EGI is referred to as the Operations and Maintenance (O&M) Contractor.**	Role The Contractor appoints the cEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr while performing the onsite activities as per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion of substation infrastructure for the transmission and distribution of electricity activities. Responsibilities - project delivery and quality control for the development services as per appointment; - employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site during the construction period; - ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely; - attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones; - ensure that contractors' staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in EMPr, to the satisfaction of the ECO.
contractor Environmental Officer (cEO)	Role Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria: Responsibilities - Be on site throughout the duration of the project and be dedicated to the project; - Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site; - Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr and Method Statements; - Attend the Environmental Site Meeting; - Undertaking corrective actions where non-compliances are registered within the stipulated timeframes; - Report back formally on the completion of corrective actions; - Assist the ECO in maintaining all the site documentation; - Prepare the site inspection reports and corrective action reports for submission to the ECO; - Assist the ECO with the preparing of the monthly report; and - Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint a cEO representing that company.

10 APPENDIX C – SITE LAYOUT

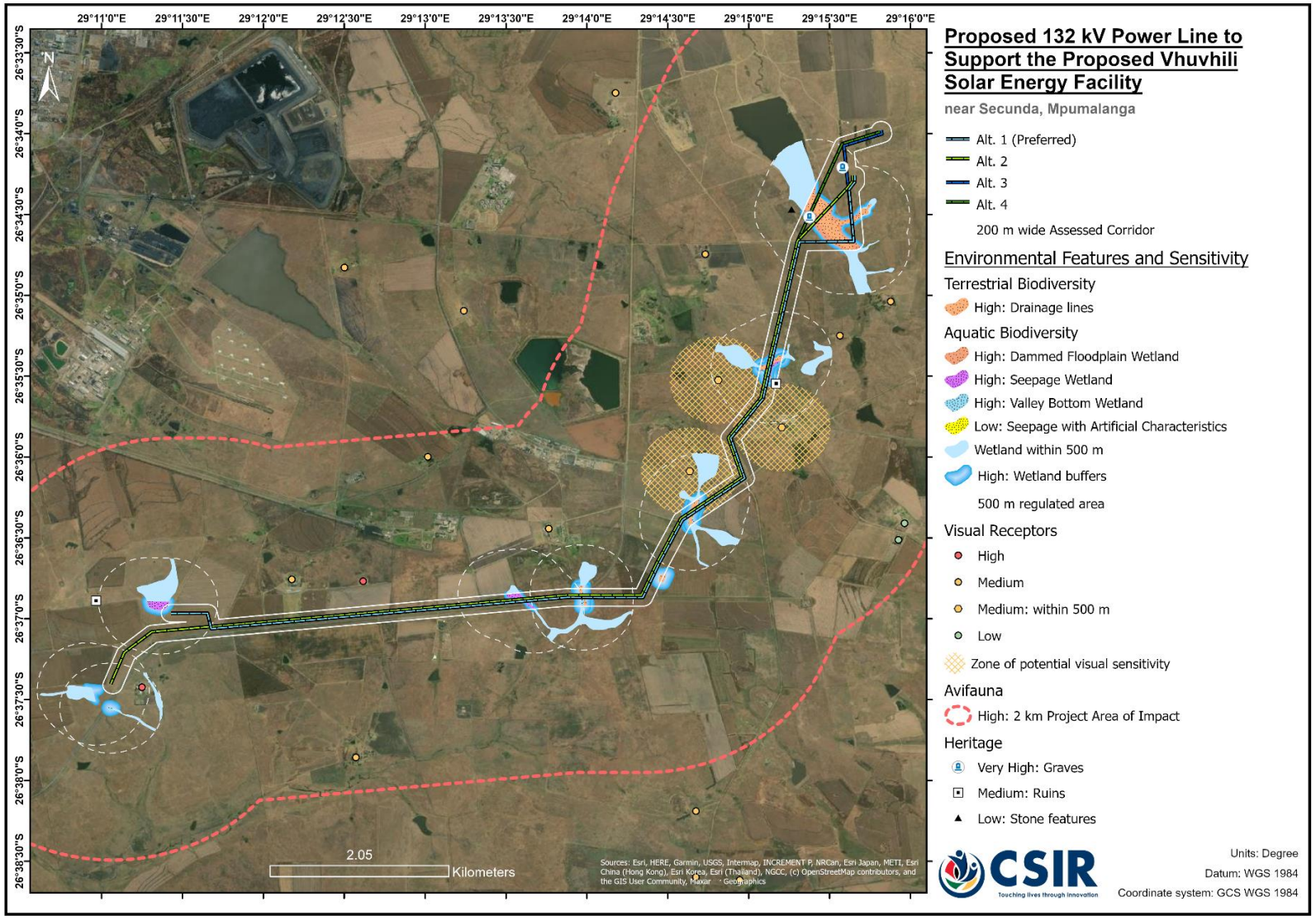


Appendix C. Map 1: Locality map showing the proposed 132 kV overhead power line routing alternatives (that is the subject of this BA Report), which extends from the proposed Vhuvhili SEF (subject of a separate S&EIA process) to the proposed Mukondeleli WEF (subject of a separate S&EIA process).

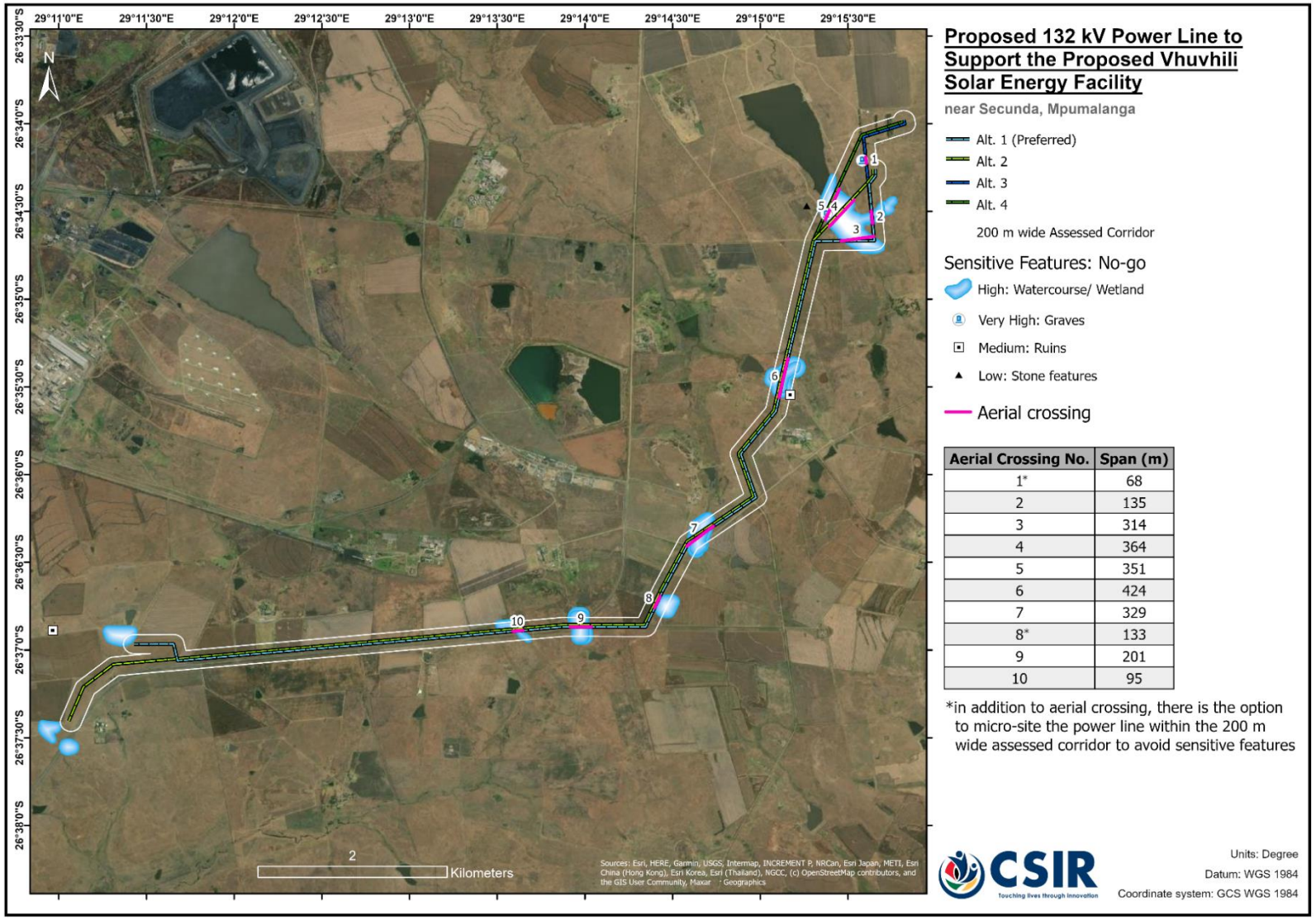
11 APPENDIX D – COMBINED LAYOUT AND SENSITIVITY MAP



Map 1: Combined Sensitivity Map for the proposed project



Appendix D. Map 2: Combined Sensitivity and Key Features Map for the proposed project



Appendix D. Map 3: Aerial Crossing Required to mitigate impact on Aquatic and Terrestrial Biodiversity Features, and Heritage Features.

12 APPENDIX E – PRE-APPROVED GAZETTED EMPR FOR POWER LINE DEVELOPMENT (GN 435)

PRE-APPROVED GENERIC EMPR TEMPLATE FOR OVERHEAD ELECTRICITY TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE GOVERNMENT GAZETTE 42323, GOVERNMENT NOTICE 435

SECTION 5: IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS

This section provides a pre-approved generic EMPr template with aspects that are common to the development of overhead electricity transmission and distribution infrastructure. There is a list of aspects identified for the development or expansion of overhead electricity transmission and distribution infrastructure, and for each aspect a set of prescribed impact management outcomes and associated impact management actions have been identified. Holders of EAs are responsible to ensure the implementation of these outcomes and actions for all projects as a minimum requirement, in order to mitigate the impact of such aspects identified for the development or expansion of overhead electricity transmission and distribution infrastructure.

The template provided below is to be completed by providing the information under each heading for each environmental impact management action.

The completed template must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must also be duly signed and dated on each page by the contactor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

5.1 Environmental awareness training

Impact management outcome: All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All staff must receive environmental awareness training prior to commencement of the activities; – The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course; – Refresher environmental awareness training is available as and when required; – All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr; – The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum: a)Safety notifications; and b) No littering.						

Impact management outcome: All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Environmental awareness training must include as a minimum the following: a) Description of significant environmental impacts, actual or potential, related to their work activities; b) Mitigation measures to be implemented when carrying out specific activities; c) Emergency preparedness and response procedures; d) Emergency procedures; e) Procedures to be followed when working near or within sensitive areas; f) Wastewater management procedures; g) Water usage and conservation; h) Solid waste management procedures; i) Sanitation procedures; j) Fire prevention; and k) Disease prevention. – A record of all environmental awareness training courses undertaken as part of the EMPr must be available; – Educate workers on the dangers of open and/or unattended fires; – A staff attendance register of all staff to have received environmental awareness training must be available. – Course material must be available and presented in appropriate languages that all staff can understand.						

5.2. Site Establishment development

Impact management outcome: Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management; – Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through; – Sites must be located where possible on previously disturbed areas; – The camp must be fenced in accordance with *Section 5.5: Fencing and gate installation*; and – The use of existing accommodation for contractor staff, where possible, is encouraged.						

5.3. Access restricted areas

Impact management outcome: Access to restricted areas prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any additional areas identified during development; – Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate; and – Unauthorised access and development related activity inside access restricted areas is prohibited.						

5.4. Access roads

Impact management outcome: Minimise impact to the environment through the planned and restricted movement of vehicles on site.		
Impact Management Actions	Implementation	Monitoring

	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Access to the servitude and tower positions must be negotiated with the relevant landowner and must fall within the assessed and authorised area; – An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities; – The access roads to tower positions must be signposted after access has been negotiated and before the commencement of the activities; – All private roads used for access to the servitude must be maintained and upon completion of the works, be left in at least the original condition – All contractors must be made aware of all these access routes. – Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense; – Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads; – In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with *section 4.9: photographic record*; prior to use and the condition thereof agreed by the landowner, the DPM, and the contractor; – Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands – Access roads must only be developed on pre-planned and approved roads.						

5.5. Fencing and Gate installation

Impact management outcome: Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Use existing gates provided to gain access to all parts of the area authorised for development, where possible; – Existing and new gates to be recorded and documented in accordance with section *4.9: photographic record*; – All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner; – At points where the line crosses a fence in which there is no suitable gate within the extent of the line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner; – Care must be taken that the gates must be so erected that there is a gap of no more than 100 mm between the bottom of the gate and the ground; – Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate; – Original tension must be maintained in the fence wires; – All gates installed in electrified fencing must be re-electrified; – All demarcation fencing and barriers must be maintained in good working order for the duration of overhead transmission and distribution electricity infrastructure development activities; – Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where appropriate and would not cause harm to the sensitive flora; – Any temporary fencing to restrict the movement of live-stock must only be erected with the permission of the landowner. – All fencing must be developed of high quality material bearing the SABS mark; – The use of razor wire as fencing must be avoided; – Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from site. Site security will be required at all times; – On completion of the development phase all temporary fences are to be removed; – The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely.						

5.6. Water Supply Management

Impact management outcome: Undertake responsible water usage.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All abstraction points or bore holes must be registered with the DHSWS and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis; – The Contractor must ensure the following: a. The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river; b. No damage occurs to the river bed or banks and that the abstraction of water does not entail stream diversion activities; and c. All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented. – Ensure water conservation is being practiced by: a. Minimising water use during cleaning of equipment; b. Undertaking regular audits of water systems; and c. Including a discussion on water usage and conservation during environmental awareness training. d. The use of grey water is encouraged.						

5.7. Storm- and wastewater management

Impact management outcome: Impacts to the environment caused by stormwater and wastewater discharges during construction are avoided.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the project manager; – All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility; – Natural stormwater runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO; – Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have						

Impact management outcome: Impacts to the environment caused by stormwater and wastewater discharges during construction are avoided.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the Project Manager's approval and support by the ECO.						

5.8. Solid and hazardous waste management

Impact management outcome: Waste is appropriately stored, handled and safely disposed of at a recognised waste facility.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All measures regarding waste management must be undertaken using an integrated waste management approach; – Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided; – A suitably positioned and clearly demarcated waste collection site must be identified and provided; – The waste collection site must be maintained in a clean and orderly manner; – Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal; – Staff must be trained in waste segregation; – Bins must be emptied regularly; – General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company; – Hazardous waste must be disposed of at a registered waste disposal site; – Certificates of safe disposal for general, hazardous and recycled waste must be maintained.						

5.9. Protection of watercourses and estuaries

Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All watercourses must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities; – In the event of a spill, prompt action must be taken to clear the polluted or affected areas; – Where possible, no development equipment must traverse any seasonal or permanent wetland – No return flow into the estuaries must be allowed and no disturbance of the Estuarine Functional Zone should occur; – Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available; – There must not be any impact on the long term morphological dynamics of watercourses or estuaries; – Existing crossing points must be favored over the creation of new crossings (including temporary access) – When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken: a) Water levels during the period of construction; b) No altering of the bed, banks, course or characteristics of a watercourse c) During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained; d) Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and e) Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows.						

5.10. Vegetation clearing

Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
General: – Indigenous vegetation which does not interfere with the development must be left undisturbed; – Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species; – Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing; – Permits for removal must be obtained from the Department of Agriculture, Forestry and Fisheries prior to the cutting or clearing of the affected species, and they must be filed; – The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals; – Trees felled due to construction must be documented and form part of the Environmental Audit Report; – Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris; – Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained; – A daily register must be kept of all relevant details of herbicide usage; – No herbicides must be used in estuaries; – All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance to *Section 5.3: Access restricted areas*. Servitude: – Vegetation that does not grow high enough to cause interference with overhead transmission and distribution infrastructures, or cause a fire hazard to any plantation, must not be cut or trimmed unless it is growing in the road access area, and then only at the discretion of the Project Manager; – Where clearing for access purposes is essential, the maximum width to be cleared within the servitude must be in accordance to distance as agreed between the land owner and the EA holder						

Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Alien invasive vegetation must be removed according to a plan (in line with relevant municipal and provincial procedures, guidelines and recommendations) and disposed of at a recognised waste disposal facility; – Vegetation must be trimmed where it is likely to intrude on the minimum vegetation clearance distance (MVCD) or will intrude on this distance before the next scheduled clearance. MVCD is determined from SANS 10280; – Debris resulting from clearing and pruning must be disposed of at a recognised waste disposal facility, unless the landowners wish to retain the cut vegetation; – In the case of the development of new overhead transmission and distribution infrastructures, a one metre "trace-line" must be cut through the vegetation for stringing purposes only and no vehicle access must be cleared along the "trace-line". Alternative methods of stringing which limit impact to the environment must always be considered.						

5.11. Protection of fauna

Impact management outcome: Minimise disturbance to fauna.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present; – The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme; – Breeding sites must be kept intact and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present; – Nesting sites on existing parallel lines must documented; – Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds; – Bird guards and diverters must be installed on the new line as per the recommendations of the specialist; – No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be marked as Access restricted areas;						

Impact management outcome: Minimise disturbance to fauna.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– No deliberate or intentional killing of fauna is allowed; – In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up, being electrocuted and causing power outages; and – No Threatened or Protected species (ToPs) and/or protected fauna as listed according NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/or relocated without appropriate authorisations/permits.						

5.12. Protection of heritage resources

Impact management outcome: Minimise impact to heritage resources.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Identify, demarcate and prevent impact to all known sensitive heritage features on site in accordance with the No-Go procedure in *Section 5.3: Access restricted areas*; – Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance; – All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/ palaeontologist (or the South African Police Services), so that a systematic and professional investigation can be undertaken. Sufficient time must be allowed to remove/collect such material before development recommences.						

5.13. Safety of the public

Impact management outcome: All precautions are taken to minimise the risk of injury, harm or complaints.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc.; – All unattended open excavations must be adequately fenced or demarcated; – Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding; – Ensure structures vulnerable to high winds are secured; – Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.						

5.14. Sanitation

Impact management outcome: Clean and well maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Mobile chemical toilets are installed onsite if no other ablution facilities are available; – The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances; – Where mobile chemical toilets are required, the following must be ensured: a) Toilets are located no closer than 100 m to any watercourse or water body; b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause; c) No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the EMPr; d) Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out; e) Toilets are emptied before long weekends and workers holidays, and must be locked after working hours; f) Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards;						

Impact management outcome: Clean and well maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– A copy of the waste disposal certificates must be maintained.						

5.15. Prevention of disease

Impact Management outcome: All necessary precautions linked to the spread of disease are taken.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Undertake environmentally-friendly pest control in the camp area; – Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS; – The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area; – Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable; – Free condoms must be made available to all staff on site at central points; – Medical support must be made available; – Provide access to Voluntary HIV Testing and Counselling Services.						

5.16. Emergency procedures

Impact management outcome: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project; – The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation; – All staff must be made aware of emergency procedures as part of environmental awareness training; – The relevant local authority must be made aware of a fire as soon as it starts; – In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see *Hazardous Substances section 5.17*).						

5.17. Hazardous substances

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible; – All hazardous substances must be stored in suitable containers as defined in the Method Statement; – Containers must be clearly marked to indicate contents, quantities and safety requirements; – All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers; – Bunded areas to be suitably lined with a SABS approved liner; – An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis; – All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS); – All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet;						

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Employees handling hazardous substances / materials must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment must be made available; – The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers; – The tanks/ bowsers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/ bowsers (110% statutory requirement plus an allowance for rainfall); – The floor of the bund must be sloped, draining to an oil separator; – Provision must be made for refueling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained; – All empty externally dirty drums must be stored on a drip tray or within a bunded area; – No unauthorised access into the hazardous substances storage areas must be permitted; – No smoking must be allowed within the vicinity of the hazardous storage areas; – Adequate fire-fighting equipment must be made available at all hazardous storage areas; – Where refueling away from the dedicated refueling station is required, a mobile refueling unit must be used. Appropriate ground protection such as drip trays must be used; – An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substance must be available at all times; – The responsible operator must have the required training to make use of the spill kit in emergency situations; – An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken; – In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to *Section 5.7* for procedures concerning *storm- and wastewater management* and 5*.8* for *solid and hazardous waste management.*						

5.18. Workshop, equipment maintenance and storage

Impact management outcome: Soil, surface water and groundwater contamination is minimised.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area; – During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts; – Leaking equipment must be repaired immediately or be removed from site to facilitate repair; – Workshop areas must be monitored for oil and fuel spills; – Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available; – The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil / water separator where maintenance work on vehicles and equipment can be performed; – Water drainage from the workshop must be contained and managed in accordance *Section 5.7: storm- and wastewater management*.						

5.19. Batching plants

Impact management outcome: Minimise spillages and contamination of soil, surface water and groundwater.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Concrete mixing must be carried out on an impermeable surface; – Batching plants areas must be fitted with a containment facility for the collection of cement laden water. – Dirty water from the batching plant must be contained to prevent soil and groundwater contamination – Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains; – A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted;						

– Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility; – Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site; – Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to *Section 5.20: Dust emissions*) – Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility; – Temporary fencing must be erected around batching plants in accordance with *Section 5.5: Fencing and gate installation*.						

5.20. Dust emissions

Impact management outcome: Dust prevention measures are applied to minimise the generation of dust.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO; – Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re- vegetated or stabilised as soon as is practically possible; – Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present; – During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level; – Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind; – Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO; – Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas; – Straw stabilisation must be applied at a rate of one bale/10 m² and harrowed into the top 100 mm of top material, for all completed earthworks; – For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.						

5.21. Blasting

Impact management outcome: Impact to the environment is minimised through a safe blasting practice.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Any blasting activity must be conducted by a suitably licensed blasting contractor; and – Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site.						

5.22. Noise

Impact Management outcome: Unnecessary noise is prevented by ensuring that noise from construction activities is mitigated.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only; – All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained; – Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers; – Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff.Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management outcome related to noise management.						

5.23. Fire prevention

Impact management outcome: Prevention of uncontrollable fires.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance

– Designate smoking areas where the fire hazard could be regarded as insignificant; – Firefighting equipment must be available on all vehicles located on site; – The local Fire Protection Agency (FPA) must be informed of construction activities; – Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site; – Two way swop of contact details between ECO and FPA.						

5.24. Stockpiling and stockpile areas

Impact management outcome: Erosion and sedimentation as a result of stockpiling are reduced.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to minimise impacts to watercourses, watercourses and water bodies; – All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods; – Topsoil stockpiles must not exceed 2 m in height; – During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.); – Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material.						

5.25. Finalising tower positions

Impact management outcome: No environmental degradation occurs as a result of the survey and pegging operations.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– No vegetation clearing must occur during survey and pegging operations; – No new access roads must be developed to facilitate access for survey and pegging purposes; – Project manager, botanical specialist and contractor to agree on final tower positions based on survey within assessed and approved areas; – The surveyor is to demarcate (peg) access roads/tracks in consultation with ECO. No deviations will be allowed without the prior written consent from the ECO.						

5.26. Excavation and Installation of foundations

Impact management outcome: No environmental degradation occurs as a result of excavation or installation of foundations.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a recognised disposal site, if not used for backfilling purposes; – Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes; – Management of equipment for excavation purposes must be undertaken in accordance with *Section 5.18: Workshop equipment maintenance and storage*; and – Hazardous substances spills from equipment must be managed in accordance with *Section 5.17: Hazardous substances*. – Batching of cement to be undertaken in accordance with Section *5.19 : Batching plants*; – Residual cement must be disposed of in accordance with Section *5.8: Solid and hazardous waste management*.						

5.27. Assembly and erecting towers

Impact management outcome: No environmental degradation occurs as a result of assembly and erecting of towers.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Prior to erection, assembled towers and tower sections must be stored on elevated surface (suggest wooden blocks) to minimise damage to the underlying vegetation; – In sensitive areas, tower assembly must take place off-site or away from sensitive positions; – The crane used for tower assembly must be operated in a manner which minimises impact to the environment; – The number of crane trips to each site must be minimised; – Wheeled cranes must be utilised in preference to tracked cranes; – Consideration must be given to erecting towers by helicopter or by hand where it is warranted to limit the extent of environmental impact; – Access to tower positions to be undertaken in accordance with access requirements in specified in Section 8.4: Access Roads;						

Impact management outcome: No environmental degradation occurs as a result of assembly and erecting of towers.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Vegetation clearance to be undertaken in accordance with general vegetation clearance requirements specified in Section 8.10: Vegetation clearing; – No levelling at tower sites must be permitted unless approved by the Development Project Manager or Developer Site Supervisor; – Topsoil must be removed separately from subsoil material and stored for later use during rehabilitation of such tower sites; – Topsoil must be stored in heaps not higher than 1 m to prevent destruction of the seed bank within the topsoil; – Excavated slopes must be no greater that 1:3, but where this is unavoidable, appropriate measures must be undertaken to stabilise the slopes; – Fly rock from blasting activity must be minimised and any pieces greater than 150 mm falling beyond the Working Area, must be collected and removed; – Only existing disturbed areas are utilised as spoil areas; – Drainage is provided to control groundwater exit gradient with the spill areas such that migration of fines is kept to a minimum; – Surface water runoff is appropriately channeled through or around spoil areas; – During backfilling operations, care must be taken not to dump the topsoil at the bottom of the foundation and then put spoil on top of that; – The surface of the spoil is appropriately rehabilitated in accordance with the requirements specified in Section 5.29: Landscaping and rehabilitation; – The retained topsoil must be spread evenly over areas to be rehabilitated and suitably compacted to effect re-vegetation of such areas to prevent erosion as soon as construction activities on the site is complete. Spreading of topsoil must not be undertaken at the beginning of the dry season.						

5.28. Stringing

Impact management outcome: No environmental degradation occurs as a result of stringing.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Where possible, previously disturbed areas must be used for the siting of winch and tensioner stations. In all other instances, the siting of the winch and tensioner must avoid Access restricted areas and other sensitive areas; – The winch and tensioner station must be equipped with drip trays in order to contain any fuel, hydraulic fuel or oil spills and leaks; – Refueling of the winch and tensioner stations must be undertaken in accordance with Section 5.17: Hazardous substances; – In the case of the development of overhead transmission and distribution infrastructure, a one metre "trace-line" may be cut through the vegetation for stringing purposes only and no vehicle access must be cleared along "trace-lines". Vegetation clearing must be undertaken by hand, using chainsaws and hand held implements, with vegetation being cut off at ground level. No tracked or wheeled mechanised equipment must be used; – Alternative methods of stringing which limit impact to the environment must always be considered e.g. by hand or by using a helicopter; – Where the stringing operation crosses a public or private road or railway line, the necessary scaffolding/ protection measures must be installed to facilitate access. If, for any reason, such access has to be closed for any period(s) during development, the persons affected must be given reasonable notice, in writing; – No services (electrical distribution lines, telephone lines, roads, railways lines, pipelines fences etc.) must be damaged because of stringing operations. Where disruption to services is unavoidable, persons affected must be given reasonable notice, in writing; – Where stringing operations cross cultivated land, damage to crops is restricted to the minimum required to conduct stringing operations, and reasonable notice (10 work days minimum), in writing, must be provided to the landowner; – Necessary scaffolding protection measures must be installed to prevent damage to the structures supporting certain high value agricultural areas such as vineyards, orchards, nurseries.						

5.29. Socio-economic

Impact management outcome: Socio-economic development is enhanced.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Develop and implement communication strategies to facilitate public participation; – Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process; – Sustain continuous communication and liaison with neighboring owners and residents – Create work and training opportunities for local stakeholders; and – Where feasible, no workers, with the exception of security personnel, must be permitted to stay over-night on the site. This would reduce the risk to local farmers.						

5.30. Temporary closure of site

Impact management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in *sections 5.17: management of hazardous substances* and *5.18 workshop, equipment maintenance and storage*; – Hazardous storage areas must be well ventilated; – Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service; – Emergency and contact details displayed must be displayed; – Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel; – Night hazards such as reflectors, lighting, traffic signage etc. must have been checked; – Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.; – Structures vulnerable to high winds must be secured; – Wind and dust mitigation must be implemented; – Cement and materials stores must have been secured; – Toilets must have been emptied and secured; – Refuse bins must have been emptied and secured;						

Impact management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Drip trays must have been emptied and secured.						

5.31. Landscaping and rehabilitation

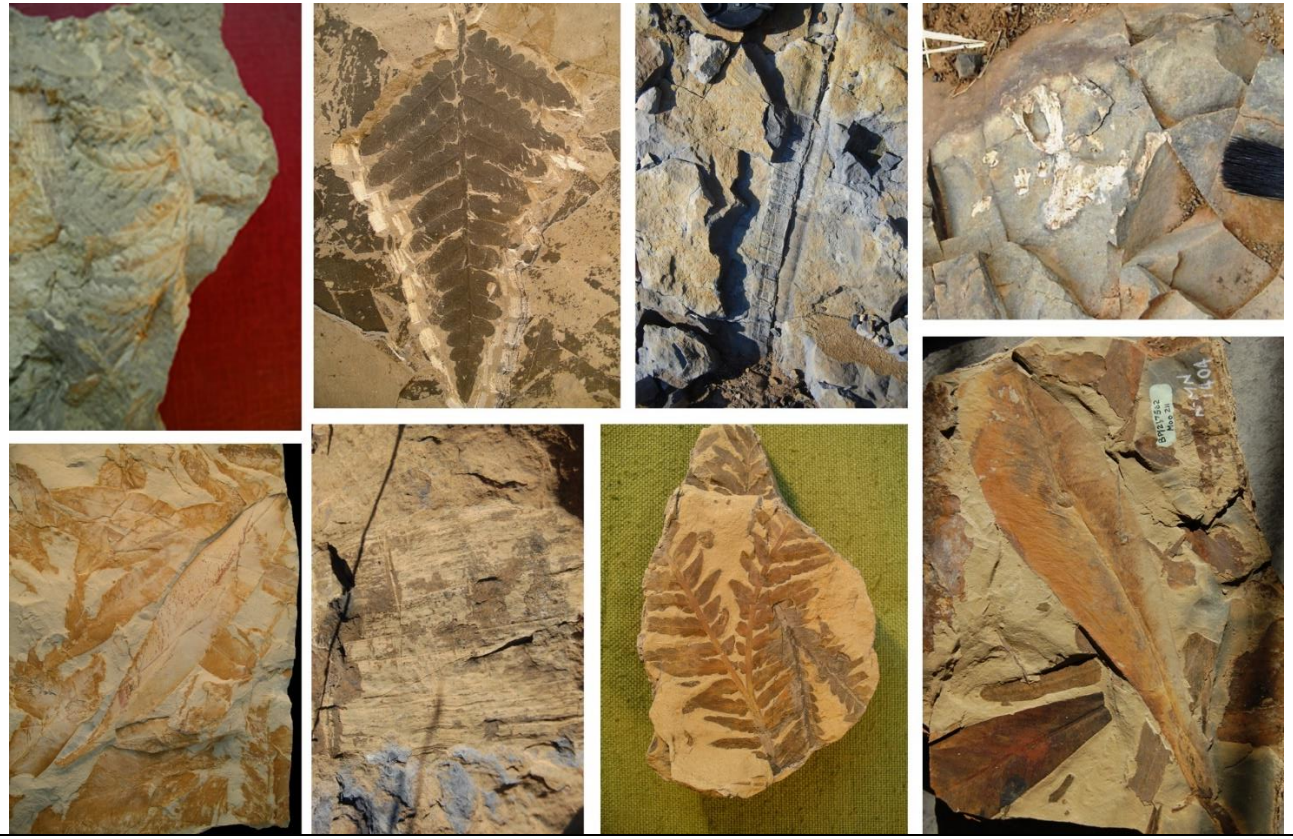
Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed to a registered waste site and certificates of disposal provided; – All slopes must be assessed for contouring, and to contour only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983 – All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983; – Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition; – Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners; – Rehabilitation of tower sites and access roads outside of farmland; – Indigenous species must be used for with species and/grasses to where it compliments or approximates the original condition; – Stockpiled topsoil must be used for rehabilitation (refer to Section *5.24: Stockpiling and stockpiled areas*); – Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion; – Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed; – Subsoil must be ripped before topsoil is placed;						

Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment; – Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; – Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly; – Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil. – Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described below. A mixture of seed can be used provided the mixture is carefully selected to ensure the following: a) Annual and perennial plants are chosen; b) Pioneer species are included; c) Species chosen must be indigenous to the area with the seeds used coming from the area; d) Root systems must have a binding effect on the soil; e) The final product must not cause an ecological imbalance in the area						

6. ACCESS TO THE GENERIC EMPr

Once completed and signed to allow the public access to the generic EMPr, the holder of the EA must make the EMPr available to the public in accordance with the requirements of regulation 26(h) of the EIA Regulations.

13 APPENDIX F – CHANCE FOSSIL FINDS PROTOCOL

Province & region:	Mpumalanga Province (Gert Sibande District Municipality): Govan Mbeki Local Municipality
Responsible Heritage Resources Agency	Mpumalanga Provincial Heritage Resource Authority (MPHRA) Contact Person: Mr Benjamin Moduka Postal address: Private Bage X11316, Nelspruit, 1200 Physical Address: 1st and 2nd floor, Building 5 Government complex, 7 Government Boulevard Riverside Park, Nelspruit, 1200 Telephone number: 013 7665198 Fax number: 013 7668256 Email: bmoduka@mpg.gov.za
Rock unit(s)	Vryheid Formation (Ecca Group, Karoo Supergroup)
Potential fossils	Plants (e.g. glossopterids, ferns and sphenophytes), insects, bone or trace fossils 

PROTOCOL: Environmental Site Officer and Environmental Control Officer	1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence 2. When excavations begin the rocks and discard must be given a cursory inspection by the environmental officer or designated person. 3. Once alerted to fossil occurrence(s): alert site foreman, stop work in area immediately (*N.B.* safety first!), safeguard site with security tape / fence / sand bags necessary.
	4. Record key data while fossil remains are still *in situ:* ▪ Record GPS coordinate ▪ Context – describe position of fossils within stratigraphy (rock layering), depth below surface ▪ Photograph fossil(s) *in situ* with scale, from different angles, including images showing context (*e.g.* rock layering) 5. Any fossiliferous material (plants, insects, bone or trace fossils) should be put aside in a suitably protected place. This way the project activities will not be interrupted
	6. Photographs of the fossils must be sent to a palaeontologist for a preliminary assessment
PROTOCOL: Specialist palaeontologist	7. If there is any possible fossil material found by the developer/environmental officer/miners then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible. 8. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits. 9. If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
General	10. If no fossils are found and the excavations have finished then no further monitoring is required

14 APPENDIX G – ALIEN INVASIVE PLANT SPECIES CONTROL

Introduction

An “invasive species” is any species whose establishment and spread outside of its natural distribution range (i) threatens ecosystems, habitats or other species or has a demonstrable potential to threaten ecosystems, habitats or other species; and (ii) may result in economic or environmental harm or harm to human health. Alien invasive plant species are globally considered as one of the greatest threats to biodiversity and ecosystems integrity.

The Alien and Invasive Species (AIS) Regulations and the AIS list was published in 2020 (NEM:BA 2020a & b).

The following categories of declared weeds and invader plants are recognised in South Africa:

Category 1a Listed Invasive Species refers to species that must be combatted or eradicated. Landowners are obliged to take immediate steps to combat or eradicate Category 1a species.

Category 1b Listed Invasive Species refers to species that must be controlled. If an Invasive Species Management Programme has been developed, landowners are obliged to control the species in accordance with such programme. The following species were recorded in the area:

Arundo donax

Cereus jamacaru

Cirsium vulgare

Cuscuta campestris

Datura ferox

Opuntia ficus-indica

Solanum elaeagnifolium

Verbena bonariensis

Verbena brasiliensis

Xanthium spinosum

Category 2 Listed Invasive Species refer to species that require a permit to carry out a restricted activity e.g. cultivation, within an area specified in the Notice or an area specified in the permit, as the case may be. Category 2 includes plant species that have economic, recreational, aesthetic or other valued properties, notwithstanding their invasiveness. It is important to note that a Category 2 species that fall outside the demarcated area specified in the permit, becomes a Category 1b invasive species. Permit-holders must take all the necessary steps to prevent the escape and spread of the species outside of the land or the area specified in the Notice or permit.

Acacia mearnsii

Eucalyptus camaldulensis

These species are exempted for existing plantations.

Category 3 Listed Invasive Species refer to species that are subject to exemptions and prohibitions as specified in the Notice. Category 3 species are less-transforming invasive species that are regulated by activity. The principal focus with these species is to ensure that they are not introduced, sold or transported. However, a Category 3 plant species becomes a Category 1b species within riparian areas.

Appendix G, Table 1: Identified alien plant species in the area (adapted from ARC, 2020)

SPECIES NAME	COMMON NAME	ILLUSTRATION
NEMBA Category: 1B invaders		
Arundo donax	Giant reed	
Cereus jamacaru	Queen of the night cacti	
Cirsium vulgare	Spear thistle	
Cuscuta campestris	Common & lucerne dodder	
Datura ferox	Large thorn apple	
Opuntia ficus-indica	Sweet prickly pear	

Solanum elaeagnifolium	Silver-leaf bitter apple	
Verbena bonariensis	Purple top, tall verbena	
Verbena brasiliensis	Slender wild verbena	
Xanthium spinosum	Spiny cocklebur	
NEMBA Category: 2 invaders		
Acacia mearnsii	Black wattle	
Eucalyptus camaldulensis	River red gum	

Prevention and control of alien invasive plant species

The removal of alien vegetation through mechanical mechanisms or application of a herbicide is likely to be required in order to curtail proliferation. The appointed ECO of the project is to be consulted prior to application of the herbicide. A specialist or contractor should be appointed prior to construction commencement to undertake a sweep and survey of the final development footprint site, with an alien invasive plant management team to remove exotic vegetation. The following measures should be applied:

- Herbicides for the control of alien species should be applied according to the relevant instructions, material safety data sheets (MSDS), and by appropriately trained personnel.
- No alien species should be used in rehabilitation or landscaping.
- Cleared areas may need to be fenced-off during rehabilitation to exclude livestock and wildlife.
- Implement a monitoring program for the early detection of alien invasive plant species. Employ a control program to combat declared alien invasive plant species
- Material brought onto site e.g. building sand should be regularly checked for the germination of alien species.

There are a number of strategies that can be employed to prevent the introduction of new invasive plant species:

- Limiting their introductions by humans;
- Creating a buffer zone of alien-free vegetation around the site;
- Integrated catchment management with the surrounding neighbours because areas around and upstream of the site provide an unlimited source of seed which invade downstream areas; and
- Maintaining a healthy grass cover by sound veld management and judicious burning of the grass sward.

Alien invaders should be controlled by mechanical and/or chemical means. Mechanical means include ringbarking (girdling), uprooting, chopping, slashing and felling. An axe, chain saw or brush cutter can be used. Stumps or ringbarked stems should be treated immediately with a chemical weed killer. Follow-up treatment is usually needed.

References

Agricultural Research Council (ARC). 2020. *Invasive alien plants in South Africa*. [https://wwfafrica.awsassets.panda.org/downloads/invasive_alien_plants_in_south_africa.pdf]

Van Rooyen, N & Van Rooyen, G. 2022. *Terrestrial and Biodiversity Species Assessment: Proposed Development of an Overhead Power Line and Supporting Infrastructure for the Proposed Vhuvhili Solar Energy Facility, near Secunda in the Mpumalanga Province.* See Appendix D of the BA Report.