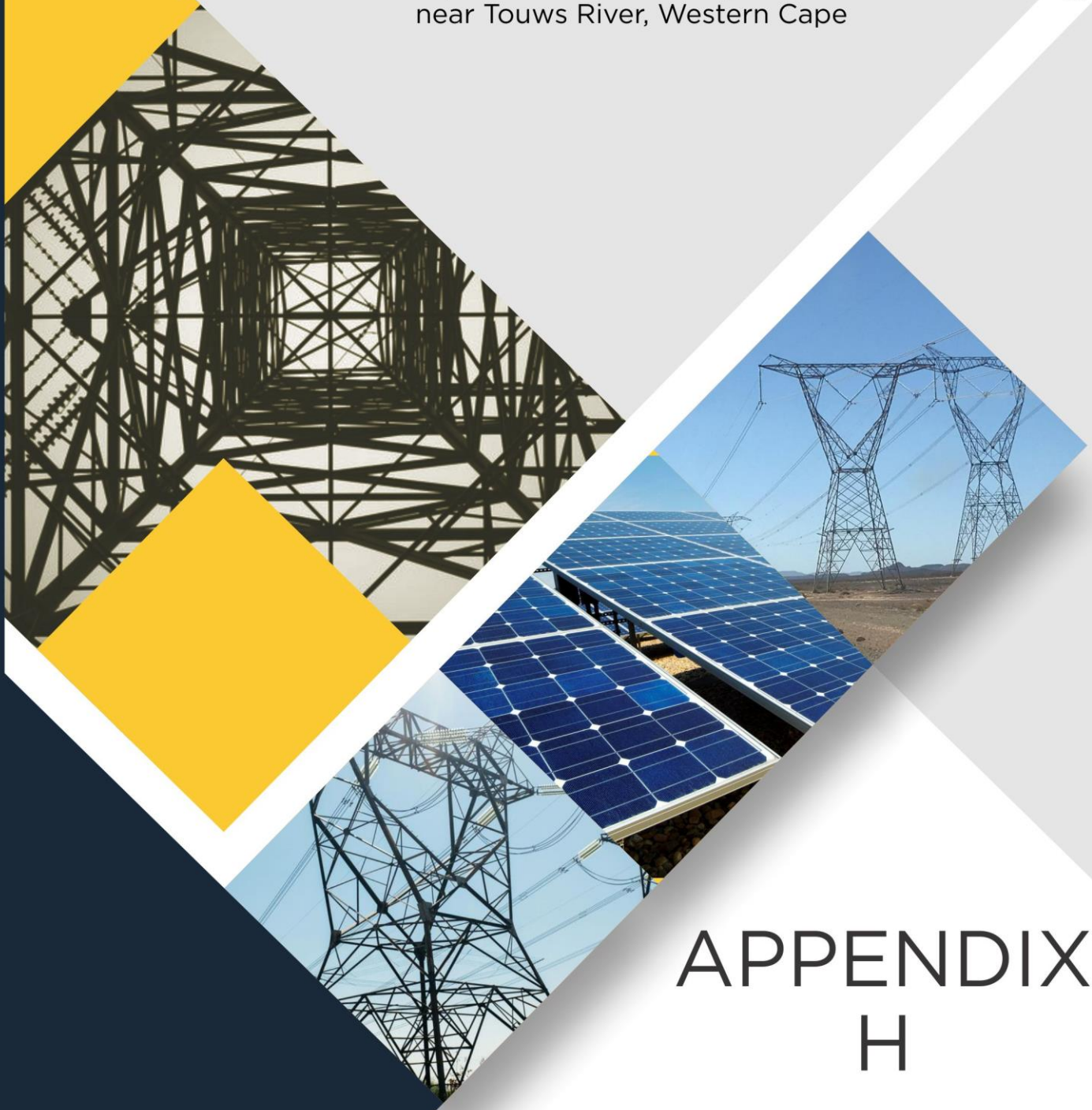
Basic Assessment for the Proposed Development of Electrical Grid Infrastructure to support the proposed nine 175 MW Solar Photovoltaic Facilities and associated Infrastructure (i.e. Witte Wall PV 1, Witte Wall PV 2, Grootfontein PV 1, Grootfontein PV 2, Grootfontein PV 3, Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3, and Hoek Doornen PV 4), near Touws River, Western Cape



APPENDIX H

Environmental Management Programme (EMPr) for the On-Site Substations

CONTENTS

TABLES

FIGURES

1 INTRODUCTION

The Project Developer, Veroniva (PTY) Ltd, is proposing to develop nine 175 MW (9 X 175 MW) Solar Photovoltaic (PV) power generation facilities and associated infrastructure, north-east of Ceres and north of Touws River, in the Western Cape Province. The associated infrastructure includes various structures, buildings and electrical grid infrastructure (EGI) such as, but not limited to, nine 132 kV power lines, nine on-site substations, and nine Lithium Ion Battery Energy Storage Systems (BESS). The proposed nine Solar PV facilities will connect to the national grid at the existing Eskom Kappa Substation. The proposed projects are located within the Witzenberg Local Municipality, which falls within the Cape Winelands District Municipality, and are situated approximately 90 km from Ceres and 70 km from Touws River. Each proposed project will be developed by a separate Project Applicant. The Project Names, Project Applicants, and respective farm portions affected by the proposed PV facilities, EGI and associated infrastructure are shown in Table 1 below.

Table 1: Project Names, Applicants and Affected Farm Portions.

Project Name	Project Applicant	Affected Farm Portions (PV Facility and Associated Infrastructure)	Affected Farm Portions (Power Lines)
Witte Wall PV 1	Witte Wall PV 1 (PTY) LTD	▪ Witte Wall RE/171	▪ Witte Wall RE/171 ▪ Die Brak RE/241 ▪ Platfontein RE/240
Witte Wall PV 2	Witte Wall PV 2 (PTY) LTD		
Grootfontein PV 1	Grootfontein PV 1 (PTY) LTD	▪ Grootfontein RE/149 ▪ Grootfontein 5/149	▪ Grootfontein RE/149 ▪ Hoek Doornen 1/172 ▪ Witte Wall RE/171 ▪ Die Brak RE/241 ▪ Platfontein RE/240
Grootfontein PV 2	Grootfontein PV 2 (PTY) LTD		
Grootfontein PV 3	Grootfontein PV 3 (PTY) LTD		
Hoek Doornen PV 1	Hoek Doornen PV 1 (PTY) LTD	▪ Hoek Doornen 1/172	▪ Hoek Doornen 1/172 ▪ Witte Wall RE/171 ▪ Die Brak RE/241 ▪ Platfontein RE/240
Hoek Doornen PV 2	Hoek Doornen PV 2 (PTY) LTD		
Hoek Doornen PV 3	Hoek Doornen PV 3 (PTY) LTD		
Hoek Doornen PV 4	Hoek Doornen PV 4 (PTY) LTD		

The proposed projects are located entirely within the Komsberg Renewable Energy Development Zone (REDZ 2), one of the eight REDZs formally gazetted in South Africa for the purpose of developing solar and wind energy generation facilities (Government Notice (GN) 114; 16 February 2018). In line with the gazetted process for projects located within a REDZ, the proposed projects are subject to a Basic Assessment (BA) process instead of a full Scoping and Environmental Impact Assessment (EIA) process and a reduced decision making period of 57 days, in terms of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) and the 2014 NEMA EIA Regulations (as amended) promulgated in Government Gazette 40772; in GN R326, R327, R325 and R324 on 7 April 2017.

Approval has been granted by the DEFF to submit combined Applications for Environmental Authorisation (EA) in terms of Regulation 11 (4) of the 2014 NEMA EIA Regulations (as amended), and the issuing of multiple EAs (should they be granted) in terms of Regulation 25 (1) and (2) of the 2014 NEMA EIA Regulations (as amended). Therefore, four separate BA Reports have been compiled, as indicated in Table 2 below, and it is proposed that nine separate EAs will be issued for each PV Facility and associated infrastructure, as well as nine separate EAs for the power lines and associated EGI that are required to support the nine PV Facilities (should they be granted):

Table 2: BA Reporting Structure and Components

	Report 1: Witte Wall Farm	Report 2: Grootfontein Farm	Report 3: Hoek Doornen Farm	Report 4: EGI
BA Reports	Group 1: Witte Wall Farm: 1 BA Report that covers the 2 PV Facilities (i.e. Witte Wall PV 1 and PV 2), 2 on-site substations, 2 Lithium Ion BESS's and all associated infrastructure.	Group 2: Grootfontein Farm: 1 BA Report that covers the 3 PV Facilities (i.e. Grootfontein PV 1, PV 2 and PV 3), 3 on-site substations, 3 Lithium Ion BESS's and all associated infrastructure.	Group 3: Hoek Doornen Farm: 1 BA Report that covers the 4 PV Facilities (i.e. Hoek Doornen PV 1, PV 2, PV 3 and PV 4), 4 on-site substations, 4 Lithium Ion BESS's and all associated infrastructure.	Group 4: EGI to support the PV Facilities: 1 BA Report that covers all the power lines and associated EGI that are required to support the 9 PV Facilities (i.e. 9 Power Lines).

This Environmental Management Programme (EMPr) is being submitted to the National Department of Environment, Forestry and Fisheries (DEFF) as part of the Application for EA for the proposed projects. **As indicated in Table 2, this EMPr covers the EGI that is required to support the nine PV Facilities.** Figure 1 shows the overall locality of the proposed EGI projects.

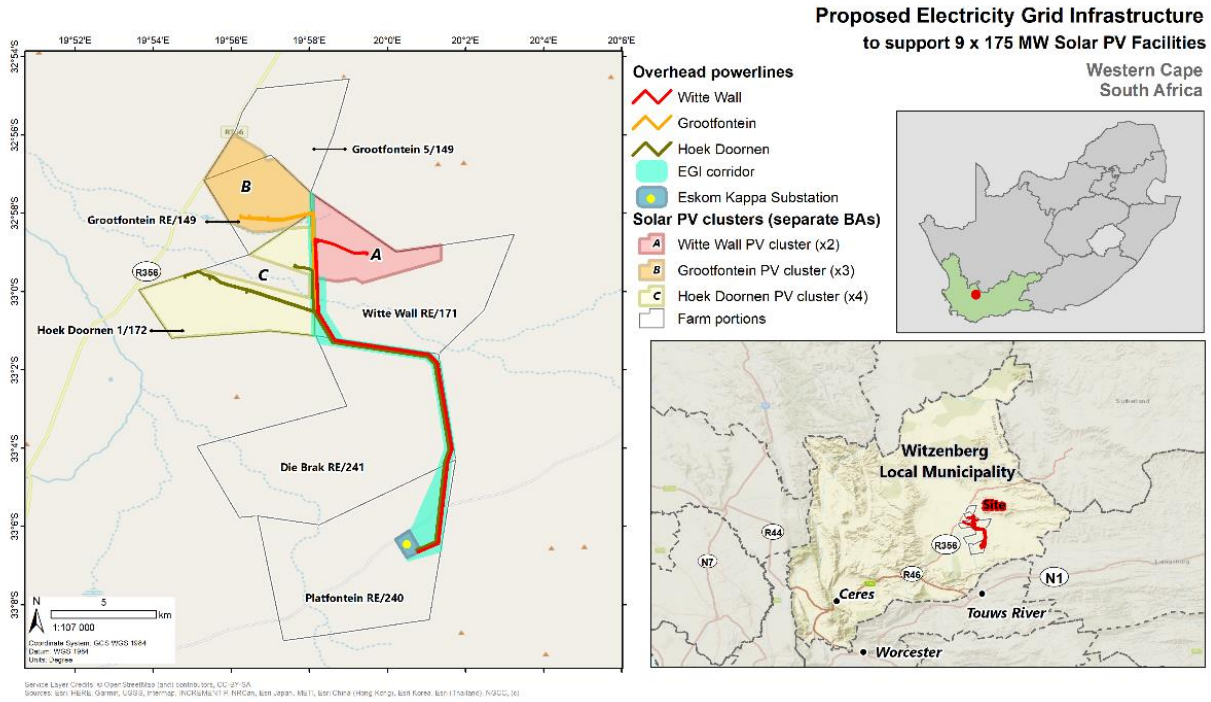


Figure 1: Locality of the EGI to support the nine proposed PV Facilities and associated infrastructure

This EMPr is being made available to Interested and Affected Parties (I&APs), stakeholders and Organs of State, as part of the BA Report, for a 30-day review period. Comments received from stakeholders during this aforementioned review period will be incorporated into this EMPr, where applicable. 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 Practitioners (Paul Lochner and Rohaida Abed) and the various specialists on the team (as indicated in Table 3). The details and expertise of the Environmental Assessment Practitioners and the specialists are provided in Appendix C and Appendix E of the BA Report. The Curriculum Vitae of the Environmental Assessment Practitioners is also included in Appendix A of this EMPr.

Paul Lochner has more than 28 years of experience in environmental assessment and management studies, primarily in the leadership and integration functions. This has included Strategic Environmental Assessments (SEA), EIAs and Environmental Management Plans. Paul is a Registered EAP (2019/745) with the Environmental Assessment Practitioners Association of South Africa (EAPASA). Paul has extensive experience in conducting environmental assessment and management processes throughout South Africa.

Rohaida Abed has a Masters degree in Environmental Science and is a registered Professional Natural Scientist (Registration Number: 400247/14) with the South African Council for Natural Scientific Professions (SACNASP). She has experience in conducting BAs and Scoping and EIAs for various sectors, including Port infrastructure and Bulk Liquid Storage facilities, and has been involved in various transport infrastructure related projects as an Environmental Control Officer.

Table 3: Details of the BA Team

Name	Organisation	Role/ Specialist Study
CSIR Project Team		
Paul Lochner (*Registered EAP (2019/745)*)	CSIR	EAP and Project Leader
Rohaida Abed (*Pr.Sci.Nat.*)	CSIR	Project Manager
Dhiveshni Moodley (*Cand.Sci.Nat.*)	CSIR	Project Officer
Luanita Snyman-van der Walt (*Pr.Sci.Nat.*)	CSIR	Project Mapping
Lizande Kellerman (*Pr.Sci.Nat.*)	CSIR	Project Specialist
Specialists		
Johann Lanz (*Pr.Sci.Nat.*)	Private	Agricultural Compliance Statement
Quinton Lawson	Quinton Lawson Architect (QARC)	Visual Impact Assessment
Bernard Oberholzer	Bernard Oberholzer Landscape Architect (BOLA)	
Dr. Jayson Orton	ASHA Consulting	Heritage Impact Assessment

Name	Organisation	Role/ Specialist Study
Dr. John Almond	Natura Viva cc	(Archaeology, Cultural Landscape and Palaeontology)
Simon Bundy (*Pr.Sci.Nat.*), Luke Maingard and Alex Whitehead (*Pr.Sci.Nat.*)	Sustainable Development Projects cc	Terrestrial Biodiversity and Species Impact Assessment
Simon Todd (*Pr.Sci.Nat.*)	3Foxes Biodiversity Solutions	Riverine Rabbit
Simon Bundy (*Pr.Sci.Nat.*), Luke Maingard and Alex Whitehead (*Pr.Sci.Nat.*)	Sustainable Development Projects cc	Aquatic Biodiversity and Species Impact Assessment
Chris van Rooyen and Albert Froneman (*Pr.Sci.Nat.*)	Chris van Rooyen Consulting	Avifauna Impact Assessment
Sandra Hill	Private	Socio-Economic Impact Assessment
Charl Muller	GEOSS South Africa (PTY) Ltd	Geohydrology Assessment
Lizande Kellerman (*Pr.Sci.Nat.*), Rohaida Abed (*Pr.Sci.Nat.*), Luanita Snyman-van der Walt (*Pr.Sci.Nat.*)	CSIR	Civil Aviation Site Sensitivity Verification
Lizande Kellerman (*Pr.Sci.Nat.*), Rohaida Abed (*Pr.Sci.Nat.*), Luanita Snyman-van der Walt (*Pr.Sci.Nat.*)	CSIR	Defence Site Sensitivity Verification
Technical Input		
Annebet Krige *Pr Eng*	Sturgeon Consulting	Traffic Impact Statement

1.2 PROJECT DESCRIPTION

It is important to point out 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 EAs, should they be granted for the proposed projects).

The proposed nine 175 MW Solar PV facilities will each cover an approximate area of 250 hectares (ha). This excludes access roads leading to the site. The specialists assessed larger areas and a 300 m wide corridor on the affected farm portions in order to avoid environmental constraints and sensitivities (highlighted by the specialists), during the siting and final design of the facilities and associated infrastructure.

As indicated in Table 2, four separate BA Processes have been undertaken. Each BA Process includes an assessment of the following infrastructure, as shown in Table 4.

Table 4: Infrastructure assessed in the BA Processes

Report 1: Witte Wall Farm Report 2: Grootfontein Farm Report 3: Hoek Doornen Farm	Report 4: EGI

• Solar Field, comprising Solar Arrays with a maximum height of 10 m and maximum footprint of 250 hectares, including the following:
  ○ PV Modules;
  ○ Single Axis Tracking structures (aligned north-south), Fixed Axis Tracking (aligned east-west), Dual Axis Tracking (aligned east-west and north-south), Fixed Tilt Mounting Structure or Bifacial Solar Modules;
	• Nine 132 kV overhead power lines to connect to the existing Eskom Kappa Substation located within a corridor of approximately 300 m wide;
	• Service road of approximately 4 m wide below the power lines;
	• Game fences along the power line routes to fence off the servitudes across the farms Witte Wall and Die Brak;
	• Nine on-site substations and/or a switching substations (the relevant section that will be

Report 1: Witte Wall Farm Report 2: Grootfontein Farm Report 3: Hoek Doornen Farm	Report 4: EGI
○ Solar module mounting structures comprised of galvanised steel and aluminium; and ○ Foundations which will likely be drilled and concreted into the ground. • Building Infrastructure: ○ Offices (maximum height 7 m and footprint of 1000 m^2); ○ Operational and maintenance control centre (maximum height 7 m and footprint 500 m^2); ○ Warehouse/workshop (maximum height 7 m and footprint 500 m^2); ○ Ablution facilities (maximum height 7 m and footprint 50 m^2); ○ Converter/inverter stations (height from 2.5 m to 7 m (maximum) and footprint 2500 m^2); ○ On-site substation and/or a switching substation building (footprint 20 000 m^2); and ○ Guard Houses (height 3 m, footprint 40 m^2). • Associated Infrastructure: ○ On-site substation and/or a switching substation (the relevant section that will be maintained by the Independent Power Producer); ○ Internal 33 kV power lines/underground cables (either underground to a maximum depth of 1.6 m or above ground with a height of 9 m); ○ Lithium Ion BESS that will cover an area of up to 8 hectares (within the laydown area) and a height of up to 5 – 10 m; ○ Underground low voltage cables or cable trays (underground to maximum depth of 1.4 m); ○ Access roads ranging between 4 - 8 m wide. ○ Internal gravel roads (width of 4 - 5 m); ○ Fencing (between 2 – 3 m high) around the PV Facilities; ○ Game fencing around each PV Facility; ○ Panel maintenance and cleaning area; ○ Stormwater channels; and ○ Construction work area (i.e. laydown area of maximum 13 ha).	transferred from the Independent Power Producer); and • Associated electrical infrastructure at the Eskom Kappa Substation (including but not limited to feeders, Busbars, new transformer bay (up to 500 MVA) and extension to the platform at the Eskom Kappa Substation).

The proposed projects will make use of PV technology to generate electricity from solar energy. Once a Power Purchase Agreement (PPA) is awarded, the proposed facility will generate and transmit electricity for a minimum period of 20 years. The construction phase for each proposed project is expected to extend 12 to 14 months.

The on-site substation and/or switching substation has two sections, as follows:

- High voltage infrastructure leading up to the Point of Connection (i.e. the Project Applicant's section of the proposed on-site substations) which is covered in the separate BA Processes for the PV Facilities (i.e. Reports 1, 2 and 3); and
- High voltage infrastructure extending from the Point of Connection (i.e. Eskom's section of the proposed on-site substations) up to the line bay at the Eskom Kappa Substation, which is covered in the BA Process for the EGI (i.e. Report 4).

This EMPr has been compiled for the high voltage infrastructure extending from the Point of Connection (i.e. the Eskom's section of the proposed on-site substations and/or a switching substations) to be located at the nine proposed PV facilities. This EMPr is included in Appendix H of the BA Report (i.e. Report 4 for the EGI, as indicated in Table 2), and is required to comply with the Generic EMPr published for substation development (Government Gazette 42323, GN 435, dated 22 March 2019).

Separate EMPRs have been compiled for the proposed PV facilities (i.e. Appendix G.1 of Report 1 for the Witte Wall Farm, Report 2 of the Grootfontein Farm and Report 3 of the Hoek Doornen Farm, as indicated in Table 2), and they comply with Appendix 4 of the 2014 NEMA EIA Regulations (as amended).

In addition, separate EMPRs have been compiled for the high voltage infrastructure leading up to the Point of Connection (i.e. the Project Applicant's section of the proposed on-site substations and/or a switching substations) to be located at the proposed PV facilities. This EMPr is included in Appendix G.2 of Report 1 for the Witte Wall Farm, Report 2 of the Grootfontein Farm and Report 3 of the Hoek Doornen Farm, as indicated in Table 2, and it complies with the Generic EMPr published for substation development (Government Gazette 42323, GN 435, dated 22 March 2019).

Furthermore, a separate EMPr has been compiled for the power lines that will enable the nine proposed PV Facilities to connect to the Eskom Kappa Substation. This EMPr is included in Appendix G of the BA Report for the EGI (i.e. Report 4 for the EGI, as indicated in Table 2), and it complies with the Generic EMPr published for power line development (Government Gazette 42323, GN 435, dated 22 March 2019).

The proposed project can be divided into the following three main phases:

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

Each activity undertaken as part of the above phases may have environmental impacts and, where applicable, has been assessed in the specialist studies (included in Appendix C of this BA Report). Management and mitigation measures required to address all the impacts are included within this EMPr.

The construction phase will take place subsequent to the issuing of the EAs from the DEFF and a successful BID in terms of the Renewable Energy Independent Power Producer Programme (REIPPPP) (i.e. the issuing of a PPA).

The main activities that will form part of the construction phase per project are:

- Removal of vegetation for the proposed infrastructure, where necessary;
- Excavations for infrastructure and associated infrastructure;
- Establishment of a laydown area for equipment;
- Stockpiling of topsoil and cleared vegetation, where necessary;
- Creation of employment opportunities;
- Transportation of material and equipment to site, and personnel to and from site; and
- Construction of the substations, and additional infrastructure.

The following activities will occur during the operational phase per PV project:

- The generation of electricity from the proposed solar facility and transmission to the Eskom Kappa Substation; and
- Maintenance of the solar field, on-site substation and associated infrastructure.

During the life span of the proposed projects (approximately 20 years each), on-going maintenance will be required on a scheduled basis.

Should it be decided not to extend the operational lifespan of the project beyond 20 years, the project will be decommissioned. The main aim of decommissioning is to return the land to its original, pre-construction condition. Should the unlikely need for decommissioning arise (i.e. if the facility becomes outdated or the land needs to be used for other purposes), the decommissioning procedure will involve removing the solar panels and associated infrastructures, and covering the concrete footings with soil to a depth sufficient for the re-growth of natural vegetation. Whether all components of the solar facility will be removed still needs to be agreed upon with the landowner (some components may be useful for the landowner and therefore it could be decided that those remain on site). Any other supporting infrastructure no longer in use will be removed from the site and either disposed of at a registered disposal facility or recycled if possible.

It should be noted that a detailed project description (based on the conceptual design) is provided in Section A of the BA Report.

1.3 ENVIRONMENTAL SENSITIVITIES

Section D of the BA Report provides a description of the environmental features and sensitive areas that were identified by the specialists for consideration in the layout and location of the proposed project. Refer to the specialist studies in Appendix C of the BA Report for details on the environmental sensitivities identified.

A 300 m wide EGI corridor and approximately 4150 ha for the PV facilities was considered and assessed by the specialists in order to ensure that any development constraints or environmental

sensitivities can be avoided in the final siting and location of the proposed facility and associated infrastructure.

Based on the findings of the specialist studies, an environmental sensitivity map has been produced. This map shows the sensitivities on site (e.g. terrestrial, aquatic, avifaunal, visual, agricultural, and heritage features) within the larger assessed area that was identified. Based on this map, the preferred location for the PV facilities, onsite substations and power lines, avoids the sensitive features that were identified by the specialists. Based on the boundaries of the assessed area and the constraints of the environmental sensitivities, a site layout has also been preliminarily determined for this project (Appendix C of this EMPr).

Appendix D of this EMPr includes the environmental sensitivity map which indicates the environmental sensitive areas and features identified during the BA Process (as described above), including the site layout.

1.4 IMPACTS IDENTIFIED DURING THE BA PROCESS

Based on the specialist studies (as shown in Table 3), the following main direct potential impacts, as indicated in Table 5, 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.

It should be noted that other impacts for which specialist studies were not undertaken but where mitigation or management actions may be required, are also included in the EMPr.

Table 5: Impacts identified in the BA Process

KEY IMPACT	IMPACTS IDENTIFIED
Agriculture	▪ Loss of agricultural land use ▪ Soil degradation
Visual	**Construction Phase** ▪ Impact 1: Potential effect of dust and noise from construction machinery during the construction of the substation and pylons, and the effect of this on residents and visitors to the area. ▪ Impact 2: Potential visual effect of access roads, stockpiles and construction camps in the exposed landscape. **Operational Phase** ▪ Impact 1: Potential visual intrusion of substations and power lines, and the impact on receptors, particularly where power lines cross roads. ▪ Impact 2: Potential visual impact of industrial type activities on the rural or wilderness character of the area **Decommissioning Phase** ▪ Impact 1: Potential visual effect of any remaining electrical grid structures and disused roads on the landscape.
Heritage and Cultural Landscape	**Construction Phase** ▪ Potential impacts to archaeological resources and graves ▪ Potential impacts to the cultural landscape **Operational and Decommissioning Phase** ▪ Potential impacts to the cultural landscape

KEY IMPACT	IMPACTS IDENTIFIED
Palaeontology	**Construction Phase** ▪ Disturbance, damage or destruction of fossils within the development footprint due to excavations and surface clearance
Terrestrial Biodiversity and Species	**Construction Phase** ▪ Impact 1: Alteration of habitat structure and composition ▪ Impact 2: Ousting (and recruitment) of various fauna ▪ Impact 3: Changes in the geomorphological state of drainage patterns ▪ Impact 4: Increased Electrical Light Pollution (ELP) ▪ Impact 5: Exclusion or entrapment of (in particular) large fauna ▪ Impact 6: Changes in edaphics (soils) due to excavation and import of soils, leading to the alteration of plant communities and fossorial species in and around these points ▪ Impact 7: Changes in subsurface water resources arising from alteration of percolation and recharge at points ▪ Impact 8: Changes in water resources and surface water in terms of water quality ▪ Impact 9: Exotic weed invasion ▪ Impact 10: Clearance of vegetation to establish roadways and other infrastructure ▪ Impact 11: Dust – according to movement of traffic and other construction related factors will affect factors such as palatability of vegetation ▪ Impact 12: Incidental pollution events, including the loss of solid waste, spillage of liquids such as hydrocarbons and other fuels as well as possible sewerage and other waste is likely to alter select points within the subject site, possibly affecting habitat form and other factors ▪ Impact 13: General disturbance on account of pedestrian movement and activities on site **Operational Phase** ▪ Impact 14: Continued alteration of habitat structure and composition on account of continuing low level anthropogenic impacts, such as “shading of vegetation” from arrays ▪ Impact 15: Ousting (and recruitment) of various fauna on account of long-term changes in the surrounding habitat/environment ▪ Impact 16: Changes in the geomorphological state of the subject site on account of long-term climatic changes and the concomitant change in the nature of the catchment arising from the land use change ▪ Impact 17: Changes in water resources and water quality (i.e. impact on water chemistry) as a result of operational activities ▪ Impact 18: Exotic weed invasion as a consequence of regular and continued disturbance of site **Decommissioning Phase** ▪ Impact 19: A reversion to an early seral stage ▪ Impact 20: A reversion to present faunal population states within the study area, with some variation to these populations being possible ▪ Impact 21: Changes in the geomorphological state of drainage lines as hydraulic changes arise within the catchment ▪ Impact 22: Exotic weed invasion as a consequence of abandonment of site and cessation of weed control measures
Aquatic Biodiversity and Species	**Construction Phase** ▪ Impact 1: Changes in the geomorphological state of drainage patterns ▪ Impact 2: Increased ELP ▪ Impact 3: Changes in water resources and surface water in terms of water quality **Operational Phase** ▪ Impact 4: Changes in the geomorphological state of the subject site on account of long-term climatic changes and the concomitant change in the nature of the catchment arising from the land use change ▪ Impact 5: Changes in water resources and water quality (i.e. impact on water chemistry) as a result of operational activities **Decommissioning Phase** ▪ Impact 6: A reversion to present faunal population states within the study area, with some variation to these populations being possible ▪ Impact 7: Changes in the geomorphological state of drainage lines as hydraulic changes arise

KEY IMPACT	IMPACTS IDENTIFIED
	within the catchment
Riverine Rabbit	**Construction Phase** ▪ Impact on Riverine Rabbits due to construction phase activities (i.e. Habitat loss and disturbance) **Operational Phase** ▪ Impact on Riverine Rabbits due to operational phase activities (i.e. Disturbance and vehicle collisions)
Avifauna Assessment	**Construction Phase** ▪ Impact 1: Displacement due to disturbance associated with the construction of the solar PV plants and associated infrastructure **Operational Phase** ▪ Impact 1: Total or partial displacement of avifauna due to habitat transformation associated with the presence of the solar PV plants and associated infrastructure ▪ Impact 2: Mortality through collisions with the solar panels ▪ Impact 3: Entrapment of medium and large terrestrial birds between the perimeter fences, leading to mortality. ▪ Impact 4: Electrocution of priority species on the internal 33kV power lines **Decommissioning Phase** ▪ Impact 1: The noise and movement associated with the activities at the study area will be a source of disturbance which would lead to the displacement of avifauna from the area
Socio-Economic	**Construction Phase** ▪ Impact 1: Disruption of local social structures ▪ Impact 2: Increased social ills and risky behaviours ▪ Impact 3: Increased burden on existing social and bulk services ▪ Impact 4: Increased road use and road traffic related accidents and/or damage ▪ Impact 5: Loss of privacy, safety and sense of place adjacent project site (Note that this impact is only specific to the Hoek Doornen and Witte Wall PV Facilities) ▪ Impact 6: Unrealistic expectations regarding local job creation ▪ Impact 7: Creation of temporary employment ▪ Impact 8: Increased household income attainment and standard of living ▪ Impact 9: Potential increase in crime ▪ Impact 10: Potential decrease in local tourism ▪ Impact 11: Potential marginalisation of local residents ▪ Impact 12: Development and/or growth of locally-owned industries **Operational Phase** ▪ Impact 1: Creation of long-term employment ▪ Impact 2: Development and/or growth of locally-owned industries ▪ Impact 3: Human development via the Economic Development Plan (EDP) **Decommissioning Phase** ▪ Impact 1: Job losses ▪ Impact 2: Local economy stimulation
Geohydrology	**Construction Phase** ▪ Lowering of groundwater levels as a result of over-abstraction ▪ Potential impact on groundwater quality as a result of accidental oil spillages or fuel leakages **Operational Phase** ▪ Lowering of groundwater levels as a result of over-abstraction ▪ Potential impact on groundwater quality as a result of using cleaning agents
Traffic[1]	**Construction and Decommissioning Phases** ▪ Potential congestion and delays on the surrounding road network ▪ Potential impact on traffic safety and increase in accidents with other vehicles or animals

[1] The Traffic Impact Statement is not a specialist study in terms of Appendix 6 of the EIA Regulations; however, it provides a general description of the potential traffic impacts.

KEY IMPACT	IMPACTS IDENTIFIED
	▪ Deterioration of the surface condition of the roads ▪ Potential dust pollution as a result of the construction and decommissioning phase vehicles ▪ Potential noise pollution as a result of the construction and decommissioning phase vehicles

2 APPROACH TO PREPARING THE EMPr

2.1 COMPLIANCE WITH RELEVANT LEGISLATION

As noted in the Gazetted EMPrs noted above (dated March 2019), the NEMA requires that an EMPr be submitted where a BA or EIA is being undertaken for an Application for EA. 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 SEA, 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 EMPrs have been gazetted and are 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 substation 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 DEFF 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 is being 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 DEFF 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 DEFF together with the Draft 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 C of the Draft 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 electrical grid infrastructure in a South African context.

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

- The study area is referred to as the larger assessed area (i.e. 4150 ha and greater for all nine PV Facilities);
- The site is referred to as the footprint of the PV Facility (i.e. approximately 250 ha).

3 ROLES AND RESPONSIBILITIES

Since the Generic EMPrs are applicable for the on-site substations and power lines, it is best to adopt the definitions of the roles and responsibilities as captured in 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.

4 SITE SPECIFIC INFORMATION

4.1 CONTACT DETAILS AND DESCRIPTION OF THE PROJECT

4.1.1 Details of the Applicant

Name of Applicant	• For the Witte Wall PV 1 On-Site Substation: **Witte Wall PV 1 (PTY) LTD** • For the Witte Wall PV 2 On-Site Substation: **Witte Wall PV 2 (PTY) LTD** • For the Grootfontein PV 1 On-Site Substation: **Grootfontein PV 1 (PTY) LTD** • For the Grootfontein PV 2 On-Site Substation: **Grootfontein PV 2 (PTY) LTD** • For the Grootfontein PV 3 On-Site Substation: **Grootfontein PV 3 (PTY) LTD** • For the Hoek Doornen PV 1 On-Site Substation: **Hoek Doornen PV 1 (PTY) LTD** • For the Hoek Doornen PV 2 On-Site Substation: **Hoek Doornen PV 2 (PTY) LTD** • For the Hoek Doornen PV 3 On-Site Substation: **Hoek Doornen PV 3 (PTY) LTD** • For the Hoek Doornen PV 4 On-Site Substation: **Hoek Doornen PV 4 (PTY) LTD**
Name of Applicant Representative	Claude Bosman
Telephone Number:	082 331 4098
Fax Number:	-
Postal Address:	P. O. Box 3253, Pinegowrie, Johannesburg, 2123
Physical Address:	8 Linden Village, Corner 4th Avenue and 11 Street, Johannesburg, 2195

4.1.2 Details and Expertise of the EAP

Company of the EAP	Council for Scientific and Industrial Research (CSIR)
Name of EAP	Paul Lochner
Telephone Number:	021 888 2486 or 084 442 3646
Fax Number:	021 888 2693
Email Address:	PLochner@csir.co.za RAbed@csir.co.za
Expertise of the EAP (Curriculum Vitae included):	**Qualifications:** ▪ B.Sc. Civil Engineering (awarded with Honours), University of Cape Town ▪ M. Phil. Environmental Science, University of Cape Town **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.**

4.1.3 Project Name

Project Name	Basic Assessment for the Proposed Development of Electrical Grid Infrastructure to support the proposed nine 175 MW Solar Photovoltaic Facilities and associated Infrastructure (i.e. Witte Wall PV 1, Witte Wall PV 2, Grootfontein PV 1, Grootfontein PV 2, Grootfontein PV 3, Hoek Doornen PV 1, Hoek Doornen PV 2, Hoek Doornen PV 3, and Hoek Doornen PV 4), near Touws River, Western Cape

4.1.4 Description of the Project

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

4.1.5 Project Location

The proposed on-site substations for the nine PV facilities will be constructed on the following farm portions:

NUMBER	FARM NAME	FARM NUMBER	PORTION NAME	PORTION NUMBER	LATITUDE (Y)	LONGITUDE (X)
Witte Wall PV Facilities						
1	Remainder of Witte Wall Farm Number 171	171	REMAINDER	0	-32.997149	20.00428
Grootfontein PV Facilities						
2	Remainder of Grootfontein Farm Number 149	149	REMAINDER	0	-32.961469	19.945826
Hoek Doornen PV Facilities						
3	Portion 1 of Hoek Doornen Farm Number 172	172	PORTION	1	-33.000379	19.938936

Co-ordinates of the proposed infrastructure are provided in Section A of the BA Report.

5 LAYOUT AND DEVELOPMENT FOOTPRINT SITE MAP

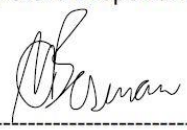
This section includes maps of sensitivities, as well as the preliminary infrastructure layout. As noted above, the feature and sensitivity map was prepared based on specialist feedback and existing databases. Individual feature and sensitivity maps are included in the specialist studies (Appendix C of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

6 APPLICANT DECLARATION

PROJECT APPLICANT 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 days prior to the date on which the activity will commence of commencement of construction to facilitate compliance inspections.

Signature Proponent/Applicant/Holder of EA



Witte Wall PV 1 (PTY) LTD
Witte Wall PV 2 (PTY) LTD
Grootfontein PV 1 (PTY) LTD
Grootfontein PV 2 (PTY) LTD
Grootfontein PV 3 (PTY) LTD
Hoek Doornen PV 1 (PTY) LTD
Hoek Doornen PV 2 (PTY) LTD
Hoek Doornen PV 3 (PTY) LTD
Hoek Doornen PV 4 (PTY) LTD

Date:

28 November 2020

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7 PROJECT SPECIFIC EMPR

The project specific EMPr is presented below per specialist theme.

7.1 SOILS AND AGRICULTURE

Impact Management Outcomes: Ensuring that disturbance and existence of hard surfaces causes no erosion on or downstream of the site; ensuring that vegetation clearing does not pose a high erosion risk; ensuring that topsoil loss is minimized; and ensuring that denuded areas are re-vegetated to stabilise soil against erosion						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
PLANNING AND DESIGN PHASE						
▪ Design an effective system of stormwater run-off control, where required (e.g. areas with concentrated volumes of run-off). The system must effectively collect and safely disseminate run-off water from all accumulation points and prevent down slope erosion.	To be completed post EA by relevant parties					
CONSTRUCTION PHASE						
▪ Implement an effective system of stormwater run-off control, where required (e.g. areas with concentrated volumes of run-off). The system must effectively collect and safely disseminate run-off water from all accumulation points and prevent down slope erosion.	To be completed post EA by relevant parties					
▪ Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion	To be completed post EA by relevant parties					
▪ If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.	To be completed post EA by relevant parties					

Impact Management Outcomes: Ensuring that disturbance and existence of hard surfaces causes no erosion on or downstream of the site; ensuring that vegetation clearing does not pose a high erosion risk; ensuring that topsoil loss is minimized; and ensuring that denuded areas are re-vegetated to stabilise soil against erosion						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
OPERATIONAL PHASE						
▪ Maintain the stormwater run-off control system. Monitor erosion and remedy the stormwater control system in the event of any erosion occurring.	To be completed post EA by relevant parties					
▪ Facilitate re-vegetation of denuded areas throughout the site.	To be completed post EA by relevant parties					
DECOMMISSIONING PHASE						
▪ Design an effective system of stormwater run-off control, where required (e.g. areas with concentrated volumes of run-off). The system must effectively collect and safely disseminate run-off water from all accumulation points and prevent down slope erosion.	To be completed post EA by relevant parties					
▪ Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.	To be completed post EA by relevant parties					
▪ If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.	To be completed post EA by relevant parties					

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						
▪ Ensure that the construction camps and stockpiles and other facilities are located in visually unobtrusive areas, away from public roads. ▪ Locate substations in un-obtrusive low-lying areas, away from public roads. ▪ Fit outdoor / security lighting at substations with reflectors to minimise light spillage. ▪ Keep maintenance and access roads as narrow as possible, and use existing roads or tracks as far as possible.	To be completed post EA by relevant parties					
CONSTRUCTION PHASE						
▪ Implement dust suppression and litter control measures, as well as rehabilitation of borrow pits (if required) and haul roads to minimise their visual effect on the surroundings. Ensure regular reporting to an environmental management team by the ECO during the construction phase.	To be completed post EA by relevant parties					
OPERATIONAL PHASE						
▪ Ensure that visual mitigation measures are monitored by management on an on-going basis, including the control of signage, lighting and wastes on the site by the appointed Environmental Manager.	To be completed post EA by relevant parties					
DECOMMISSIONING PHASE						
▪ Ensure that procedures for the removal of structures and stockpiles during the decommissioning phase are implemented, including recycling of materials and rehabilitation of the site to a visually acceptable standard as prescribed in a rehabilitation plan, and signed off by the delegated authority.	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**
▪ Ensure that the substation structures are removed and that building structures are demolished or recycled for new uses. ▪ Rip and regrade access roads that are no longer required. ▪ Exposed or disturbed areas must be revegetated or returned to grazing or pasture to blend with the surroundings.						

7.3 HERITAGE IMPACTS (ARCHAEOLOGY, PALAEONTOLOGY AND CULTURAL LANDSCAPE)

Impact Management Outcomes: Achieve a layout that minimizes the potential later impacts to archaeological resources and/or graves. Reduce the degree of visual contrast in the landscape. Minimise the chances of significant archaeological sites and/or graves being disturbed.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
PLANNING AND DESIGN PHASE						
▪ Commission a detailed pre-construction archaeological survey of the approved PV layouts in order to (1) ascertain whether any further sites are present within the footprints and (2) choose the densest and best areas of background scatter for formal sampling (i.e. to determine appropriate sample areas from which to collect artefacts). While background scatter artefacts occur widely and in variable densities across the landscape, it is suggested that one area per PV project footprint could be collected from in order to record some of the variability across the wider project area. Further recommendations will stem from the results of that survey. The survey should be done well in advance of construction (preferably at least 6 months) in order to allow time for the following: o The field survey; o Reporting to Heritage Western Cape (HWC) and application for Workplan	To be completed post EA by relevant parties					

Impact Management Outcomes: Achieve a layout that minimizes the potential later impacts to archaeological resources and/or graves. Reduce the degree of visual contrast in the landscape. Minimise the chances of significant archaeological sites and/or graves being disturbed.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
approval; o Conducting the mitigation fieldwork; o Analysis and reporting; and o Final approval by HWC. ▪ Ensure that the design ensures the protection of the possible grave at waypoint 150. The feature should be fenced and marked as a sensitive area. **This is only applicable to the Witte Wall PV 1 and Witte Wall PV 2 projects.** ▪ Ensure that the pottery scatter at waypoint 145 must be collected. **This is only applicable to the Witte Wall PV 2 project.** ▪ No activity is to happen north of the existing farm fence alongside waypoint 177, an existing Later Stone Age (LSA) site. The design must ensure the protection of the archaeological site at waypoint 177. The existing farm fence must be retained in its current location and all project activities kept to the south of it. **This is only applicable to the Grootfontein PV 1, PV 2 and PV 3 projects.** ▪ The stone boundary beacon at waypoint 132 must be protected from harm. Any road widening needed here must be undertaken towards the north. The design must ensure the protection of the archaeological site at waypoint 132. **This is only applicable to the Hoek Doornen PV 4 project.** ▪ Locate the laydown area, batching plant and buildings far from the public road (in accordance with the sensitivity mapping provided by the Visual Specialist (i.e. at least 250 m away from arterial and district roads)). ▪ Ensure the use of natural colours and finishes on buildings.						
CONSTRUCTION PHASE						
▪ Ensure that no activity takes place outside of the authorized construction footprint. ▪ The ECO must ensure that all staff are informed of the possibility of finding buried	To be completed post EA by relevant parties					

Impact Management Outcomes: Achieve a layout that minimizes the potential later impacts to archaeological resources and/or graves. Reduce the degree of visual contrast in the landscape. Minimise the chances of significant archaeological sites and/or graves being disturbed.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
archaeological resources and graves (i.e. ensure that all personnel are aware of the potential of encountering archaeological resources and graves and what to do if this occurs (i.e. to report any suspicious stone features prior to disturbance)). ▪ The ECO must conduct formal monitoring site visits to (1) verify that all work is remaining within the authorised area and (2) check for any fossils or artefact concentrations that might be revealed. ▪ If any concentrations of archaeological material, graves or stone features are uncovered during the proposed construction, 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. Sufficient time should be allowed to remove/collect such material. A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the findings. ▪ Minimise the disturbance footprint. ▪ Employ dust suppression measures. ▪ Ensure effective rehabilitation.						
OPERATIONAL PHASE						
▪ Minimise light pollution. ▪ Signage to be small and unobtrusive.	To be completed post EA by relevant parties					
DECOMMISSIONING PHASE						
▪ Minimise the disturbance footprint. ▪ Employ dust suppression measures. ▪ Ensure effective rehabilitation.	To be completed post EA by relevant parties					

7.4 TERRESTRIAL ECOLOGY

▪ **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						
▪ Ecologist to review the final layout plan in relation to existing drainage patterns and comment accordingly on stormwater management across the site. ▪ Ensure the necessary permits or licences are identified and applied for as applicable. Await response and provision of permit. Undertake plant rescue if and where required. ▪ 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. Compile and finalise invasive alien plant management programme. ▪ Where vegetation is cleared, measures to counteract aeolian (wind-blown) transport in the short and long term should be implemented, where necessary. Use of drift fence and related measures, where required. Appoint an Ecologist to advise on clearance and planting, where required.	To be completed post EA by relevant parties					
CONSTRUCTION PHASE						
▪ Appoint a specialist to undertake a second review and site visit of the final layout of the development footprint, possibly during the late summer or early winter period, in order to identify any plant species on site that may require “rescue” as well as any exotic weeds/vegetation that require removal. ▪ Appoint a specialist to conduct an inspection of the final project area and sweep or inspect the site for any fauna, once the fencing is complete (i.e. the established site should be flushed to ensure any large wildlife is not contained within the fenced area). Ensure regular flushing of the area throughout the construction phase. ▪ The removal of alien vegetation through mechanical mechanisms or application of a	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**
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. ▪ Ensure construction activities are limited to the development footprint in order to minimise the extent of impact ▪ Clearance activities are to be strictly confined to the development footprint. Clearance is to be carried out where needed to accommodate infrastructure. ▪ Ensure all hazardous materials are adequately stock piled in a leak proof receptacle. ▪ Ensure a spill kit is placed on site in order to contain any hydrocarbon leaks if necessary. ▪ Impose a speed limit on construction vehicles operating within the construction site. ▪ 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. ▪ 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).						
OPERATIONAL PHASE						
▪ Ensure that the faunal components are retained and management of the facilities are ecologically driven. ▪ Exclusion areas should be maintained. Maintain scarp slopes and ensure that they are unimpeded by the proposed development. Avoid extensive alteration of sheet wash areas. ▪ Cordon off the sites to prevent inward migration of fauna. ▪ All vehicles that are stationary/parked for longer than 30 days within the site are to have a	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**
drip tray placed underneath the engine. ▪ A spill kit is to be placed onsite in order to limit any impact. ▪ Limit access to the riverine areas. ▪ Implementation of an invasive alien plant management programme.						
DECOMMISSIONING PHASE						
▪ Ensure that there is appropriate disposal of materials and waste during decommissioning activities. ▪ Manage stabilisation and reinstatement of the land. ▪ Provide adequate stormwater controls to ensure attenuation of stormwater runoff emanating from hard panned surfaces. ▪ Cordon off access to dendritic drainage lines. ▪ Post bi-yearly monitoring of the site to hinder proliferation of exotic species as a result of the development.	To be completed post EA by relevant parties					

7.5 AQUATIC ECOLOGY

Impact Management Outcomes: Reduce changes in the geomorphological state of drainage patterns in order to reduce impacts on aquatic ecology						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
PLANNING AND DESIGN PHASE						
▪ Exclusion areas should be maintained. Maintain scarp slopes are unimpeded by development. Avoid the major drainage lines, such as the Groot, Klein Droelaagte, and Droelaagte Rivers. Avoid extensive alteration of sheet wash areas. The sensitivities are captured in the sensitivity map included in Appendix D of this EMPr. ▪ Maintenance and establishment of an ambulatory set back of more than 100 m from the identified riparian areas and points of sheet wash as per the map presented in the Aquatic Biodiversity and Species Report, and Appendix D of this EMPr. ▪ A detailed stormwater management and drainage plan should be developed that considers inter alia, surface flows arising from elevated areas above the PV facilities and its discharge from the facilities. This philosophy must include attenuation and energy dissipation mechanisms and redress of erosion and sheet flow across site. ▪ Management of fauna within the site and surrounds, as well as the incorporation of wildlife porosity into fence lines and the implementation of measures on the energised fence line to avoid mortalities to wildlife. ▪ Ensure reduced security lighting, downward lighting and restriction on lumens employed ▪ Ensure that the Department of Human Settlements, Water and Sanitation are consulted with to confirm the need and requirements of a Water Use Licence, as noted in the Aquatic Biodiversity and Species Assessment.	To be completed post EA by relevant parties					
CONSTRUCTION PHASE						
▪ Cordon off the sites to prevent inward migration of fauna. ▪ Provide adequate stormwater controls to ensure attenuation of stormwater runoff emanating from the other hard panned surfaces.	To be completed post EA by relevant parties					

Impact Management Outcomes: Reduce changes in the geomorphological state of drainage patterns in order to reduce impacts on aquatic ecology						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
OPERATIONAL PHASE						
▪ Cordon off the sites to prevent inward migration of fauna. ▪ Provide adequate stormwater controls to ensure attenuation of stormwater runoff emanating from the hard panned surfaces. ▪ Implement proper spill control and management, such as the retention of emergency spill kits on site.	To be completed post EA by relevant parties					
DECOMMISSIONING PHASE						
▪ Ensure that there is appropriate disposal of materials and waste. ▪ Manage stabilisation and reinstatement of the land. ▪ Provide adequate stormwater controls to ensure attenuation of stormwater runoff emanating from hard panned surfaces. ▪ Cordon off access to dendritic drainage lines. ▪ Post bi-yearly monitoring of the site to hinder proliferation of exotic species as a result of the development.	To be completed post EA by relevant parties					

7.6 RIVERINE RABBIT

Impact Management Outcomes: Reduce habitat loss and disturbance as associated impact on Riverine Rabbit.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
PLANNING AND DESIGN PHASE						
▪ Adhere to the development restrictions placed on areas of High and Very High sensitivity in the Riverine Rabbit Assessment and adhere to the sensitivity maps provided within the assessment when determining the final layout. The sensitivities are captured in the sensitivity map included in Appendix D of this EMPr. No substations are to be placed in these areas and any roads through these areas should use existing footprint areas, where possible. ▪ The design should ensure that there is no electrical fencing around the substations or other infrastructure that are within 20 cm of the ground as some fauna can become stuck against such fences and are electrocuted to death.	To be completed post EA by relevant parties					
CONSTRUCTION PHASE						
▪ All vehicles should adhere to a low speed limit on site. Heavy vehicles should be restricted to 30 km/h and light vehicles to 40 km/h. ▪ As Riverine Rabbit activity is highest between dusk and dawn, traffic during these hours should be curtailed. ▪ Limiting access to the site and ensuring that construction staff and machinery remain within the demarcated construction areas during the construction phase. ▪ Environmental induction for all staff and contractors on-site must be undertaken.	To be completed post EA by relevant parties					
OPERATIONAL PHASE						
▪ Human activity and disturbance outside of the fenced areas should be kept to a minimum and restricted to required maintenance activities only. ▪ All vehicles should adhere to a low speed limit on-site. Heavy vehicles should be restricted	To be completed post EA by relevant parties					

Impact Management Outcomes: Reduce habitat loss and disturbance as associated impact on Riverine Rabbit.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
to 30 km/h and light vehicles to 40 km/h. ▪ Ensure that all the operational phase management plans are fully implemented and that the associated monitoring and feedback mechanisms to management are in place.						

7.7 AVIFAUNA IMPACTS

Impact Management Outcomes: Prevent unnecessary displacement of avifauna.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
PLANNING AND DESIGN PHASE						
▪ A 300 m infrastructure-free buffer must be maintained at water reservoirs in terms of the sensitivities determined in Figure 12 of the Avifauna Assessment report and as captured in the sensitivity mapping showing in Appendix D of this EMPr.	To be completed post EA by relevant parties					
CONSTRUCTION PHASE						
▪ Ensure that contractors are aware of the requirements of the Construction EMPr (CEMPr. 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 No off-road driving; o 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; o Measures to control noise and dust according to latest best practice;	To be completed post EA by relevant parties					

Impact Management Outcomes: Prevent unnecessary displacement of avifauna.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
○ Restricted access to the rest of the property; ○ Strict application of all recommendations in the Terrestrial Biodiversity and Species Assessment Report pertaining to the limitation of the footprint, limiting the vegetation clearance to what is absolutely necessary, and rehabilitation of transformed areas.						
DECOMMISSIONING PHASE						
▪ Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the Decommissioning EMPr (DEMPr). A site-specific DEMPr must be implemented, which gives appropriate and detailed description of how decommissioning 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: ○ No off-road driving; ○ Maximum use of existing roads during the decommissioning phase and the construction of new roads should be kept to a minimum as far as practical; ○ Measures to control noise and dust according to latest best practice; ○ Restricted access to the rest of the property; ○ Strict application of all recommendations in the Terrestrial Biodiversity and Species Assessment Report pertaining to the limitation of the footprint.	To be completed post EA by relevant parties					

7.8 SOCIO-ECONOMIC IMPACTS

Impact Management Outcomes: Maximize potential job creation for locals. Prevent unnecessary social order disturbance, general disorientation and deterioration of social capital. Minimize increase of social ills and risky behaviours associated with workforce influx to the area.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
PLANNING AND DESIGN PHASE						
▪ It is strongly suggested that a 'locals first' policy with regard to labour needs is implemented. The developer should make every effort to ensure the majority of construction workers are de facto residents of the Tankwa Karoo, Touws River and/or Ceres region. ▪ Draft an Economic Development Plan (EDP) for the project to align local investment with local needs. A comprehensive EDP enabling maximum benefit and agency to the beneficiary communities. The EDP to be developed must be prepared by community development practitioners, to ensure that it can be effectively implemented and managed, bringing maximum benefit to the community. A third-party approach is recommended. ▪ The developer or the appointed agent must engage with local communities, religious organisations, organised agriculture, NGOs, CBOs and local government structures to identify and agree upon priorities and include them in the EDP. ▪ Where possible, the EDP should align with the Integrated Development Plans (IDPs) of the relevant Local Municipalities.	To be completed post EA by relevant parties					
CONSTRUCTION PHASE						
▪ The developer should make every effort to ensure the majority of construction workers are de facto residents of the Tankwa Karoo, Touws River and/or Ceres region. ▪ Where possible, subcontract to local construction companies. ▪ Develop and implement communication strategies to facilitate participation. The developer should be mindful of and regularly engage with landowners, farm residents and with Touws River and/or Ceres local communities. The former can be achieved through liaison with the Tankwa Ceres Karoo Farmers' Union. The latter can be achieved in collaboration with local	To be completed post EA by relevant parties					

Impact Management Outcomes: Maximize potential job creation for locals. Prevent unnecessary social order disturbance, general disorientation and deterioration of social capital. Minimize increase of social ills and risky behaviours associated with workforce influx to the area.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
community organisations. ▪ The developer should develop and clearly communicate a Code of Conduct for all employees related to the project, which includes zero tolerance of activities such as violence, alcohol and drug abuse. ▪ Introduce weekly randomized alcohol and drug testing for all employees related to the project. ▪ No construction workers should be allowed to sleep at the construction site. ▪ All COVID regulations and safety precautions in force at the time of construction, operation and decommissioning must be communicated to workforce, enforced and upheld by the developer. ▪ The construction workforce should receive COVID-19 awareness training before the commencement of construction. In addition, TB testing and counselling should be made available to the construction workforce free of charge. ▪ Local HIV infection rates/ARV treatment loads must be monitored annually through close interaction with the local clinic. Should infections and treatment loads increase at a rate greater than the anticipated rate of increase; the developers (or the appointed agent) must re-evaluate its HIV awareness training, take corrective action where necessary, and repeat said training. ▪ Traffic expert should be consulted, prior to construction, and a road and traffic management plan devised and implemented to mitigate potential negative consequences of increased road use during construction. ▪ A maximum 60 km/h speed limit should be enforced on private roads. ▪ The developer must engage the local communities in the study area on the nature, duration, number and availability of employment opportunities well in advance of any construction activities taking place. It is recommended that existing social structures be utilised for such interaction, and that the process be commenced once environmental authorisations have been granted.						

Impact Management Outcomes: Maximize potential job creation for locals. Prevent unnecessary social order disturbance, general disorientation and deterioration of social capital. Minimize increase of social ills and risky behaviours associated with workforce influx to the area.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ The developer should establish employment desks in the Tankwa Karoo, Touws River and/or Ceres region to facilitate employment-related queries, and maintain a register of applicants which reflects their respective expertise, skill level and contact/residential details. Whenever planned or ad hoc employment is considered, the register should be consulted to identify appropriately qualified candidates. ▪ Employment procedures should not preclude the educationally and resource poor. ▪ The existence of the employment desks and the relevant procedures associated with the selection and appointment of workers must be communicated to the local communities. ▪ The developer should comply with the Employment Equity Act (EEA) and make every effort to ensure equal access to employment, taking the demographics of the area into account. ▪ The developer should offer debt education workshops for all project related employees. The developer is encouraged to provide on-the-job training and additional training programs to improve the chances of skills development during the construction phase. ▪ Access to the project site should be controlled with only authorised staff permitted entry. Movement to and from the project site should be controlled where construction workers are transported to and from the pick-up area and project site by the developer or the appointed agent only. ▪ The developer could consider forming or participating in a local safety forum and/or community watch to address any concerns related to possible crime escalation. ▪ The developer could consider erecting and/or contributing to the costs of erecting security cameras and/or a repeater to help improve crime prevention and management in the area. ▪ The developer should make use of local eco-tourism services and product providers where possible. The developer should provide consultants, contractors and other skilled project related staff with a list of local eco-tourism services and product providers, and local service and goods providers, with a clear request to support local eco-tourism and businesses, where possible, and where such services are required. ▪ The developer should consider appointing a community liaison person tasked with						

Impact Management Outcomes: Maximize potential job creation for locals. Prevent unnecessary social order disturbance, general disorientation and deterioration of social capital. Minimize increase of social ills and risky behaviours associated with workforce influx to the area.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
establishing and maintaining effective communication with local residents and/or their representatives.						
OPERATIONAL PHASE						
▪ The developer should make every effort to ensure the majority of unskilled workers employed during this phase are de facto residents of the Tankwa Karoo, Touws River and/or Ceres region. ▪ Employment opportunities and the existence of the employment desks must be communicated to the local communities in the Tankwa Karoo, Touws River and/or Ceres region. ▪ The employment desk registers compiled during construction phase should be consulted to identify appropriately qualified candidates. ▪ The developer must comply with the EEA and make every effort to ensure equal access to employment, taking the demographics of the area into account. ▪ Contracts ensuring that knowledge sharing and on-the-job training should be enforced as a condition for the development of the project. ▪ The developer should procure goods and services locally where possible. ▪ The developer should provide consultants, and other project related staff with a list of local service providers with a clear request to support local businesses where such services are required.	To be completed post EA by relevant parties					
DECOMMISSIONING PHASE						
▪ The developer should comply with relevant South African labour legislation when retrenching employees. ▪ The developer should implement appropriate succession training of locally employed staff earmarked for retrenchment during decommissioning.	To be completed post EA by relevant parties					

7.9 GEOHYDROLOGY IMPACTS

Impact Management Outcomes: To reduce the impact of the proposed project on the groundwater resources. To prevent the lowering of groundwater levels as a result of over-abstraction (should ground water be used during the project phases). To reduce the potential of groundwater pollution.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
PLANNING AND DESIGN PHASE						
▪ If ground water from existing boreholes is to be used as a water source during the project phases, then a registration process must be followed for the use of existing boreholes; i.e. Section 39 of the National Water Act (Act 36 of 1998, as amended). Ensure that the Department of Human Settlements, Water and Sanitation (DHSWS) are consulted with to confirm the need and requirements of a General Authorisation for use of existing boreholes in the vicinity. In addition, agreements must be put in place with the current land owners for the use of groundwater. These agreements must be legally valid documents. ▪ If no such agreements can be put in place, and if ground water needs to be used, then additional boreholes may be drilled on the relevant farm portions, followed by yield and water quality testing, and then authorization from DHSWS to use the ground water will be required.	To be completed post EA by relevant parties					
CONSTRUCTION PHASE						
▪ The boreholes that are to be used must be correctly yield tested prior to use according to the National Standard (SANS 10299-4:2003, Part 4 – Test pumping of water boreholes) so that the correct pump sizes and installation depths can be determined. This includes a Step Test, Constant Discharge Test and recovery monitoring. ▪ The boreholes should also be sampled and chemically and microbiologically analysed by a SANAS accredited laboratory. ▪ Once the boreholes are in use they should be equipped with: o Observation pipes - so that the water levels can be measured (either manually or by data loggers); o Flow meters – to assess how much water is used and thereby all authorisations	To be completed post EA by relevant parties					

Impact Management Outcomes: To reduce the impact of the proposed project on the groundwater resources. To prevent the lowering of groundwater levels as a result of over-abstraction (should ground water be used during the project phases). To reduce the potential of groundwater pollution.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
in place for use of the water are adhered to; and ○ Sampling tap – to enable annual sampling to ensure the groundwater is safe for continued use – especially if it is to be used as drinking water. ▪ Adhere to the borehole's safe yield and to monitor water levels and flow. ▪ Avoid using old or damaged construction equipment and vehicles and ensure that they are well maintained and regularly serviced in order to ensure no leakages. All vehicles and other equipment (generators etc.) must be regularly serviced to ensure they do not spill oil. ▪ Any engines that stand in one place for an excessive length of time (i.e. 30 days) must have drip trays. Diesel fuel storage tanks, if required, should be above ground on an impermeable concrete surface in a bunded area. ▪ Vehicles should be refuelled on paved (impervious) areas, optimally off-site. If off-site refuelling is not possible, a designated area and impermeable surface should be established at the construction site camp for this purpose. If liquid product is being transported it must be ensured this does not spill during transit. ▪ If spillages occur during refuelling, they should be contained and removed as rapidly as possible, with correct disposal procedures of the spilled material, and reported. Proof of disposal (waste disposal slips or waybills) should be obtained and retained on file for auditing purposes. ▪ Emergency measures and plans must be put in place and rehearsed in order to prepare for accidental spillage. ▪ Vehicle and washing areas must also be on paved surfaces and the by-products removed to an evaporative storage area or a hazardous waste disposal site (if the material is hazardous).						
OPERATIONAL PHASE						
▪ Adhere to the borehole's safe yield and to monitor water levels and flow and implement pollution prevention mechanisms as recommended for the operational phase.	To be completed post EA by relevant parties					

Impact Management Outcomes: To reduce the impact of the proposed project on the groundwater resources. To prevent the lowering of groundwater levels as a result of over-abstraction (should ground water be used during the project phases). To reduce the potential of groundwater pollution.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
DECOMMISSIONING PHASE						
▪ Adhere to the borehole's safe yield and to monitor water levels and flow and implement pollution prevention mechanisms as recommended for the decommissioning phase.						

7.10 TRAFFIC IMPACTS

Impact Management Outcomes: Manage impact that additional traffic generation will have on the road network. Plan the project to spread and reduce the amount of road based traffic and avoid local congestion periods during the construction phase.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
PLANNING AND DESIGN PHASE						
▪ If abnormal loads need to be transported by road to the site, a permit will need to be applied for in terms of Section 81 of the National Road Traffic Act and authorisation needs to be obtained from the relevant road authorities to modify the road reserve to accommodate turning movements at intersections (if necessary). ▪ The route to the sites should be further investigated to ensure that abnormal loads are not obstructed at any point by geometric, height and width limitations along the route. ▪ Discussions must be held with the relevant landowners on which the internal gravel access farm road leading to the sites is located, prior to commencement to confirm requirements and details of the agreement. ▪ Ensure that the requirements for use of the gravel access farm road leading to the sites are addressed and considered in the design, as and where applicable.	To be completed post EA by relevant parties					

Impact Management Outcomes: Manage impact that additional traffic generation will have on the road network. Plan the project to spread and reduce the amount of road based traffic and avoid local congestion periods during the construction phase.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ Provide a Transport Traffic Plan to the Provincial and Municipal Road Department (if required). ▪ A Road Maintenance Plan should be developed for the gravel external access roads and the internal gravel access farm road that will be used. The plan should address requirements such as, but not limited to, grading, dust suppressant mechanisms, drainage (where required), signage, and speed limits. The Road Maintenance Plan must ensure regular maintenance of the gravel external access roads, as well as the upgrading of and regular maintenance of the internal farm access road.						
CONSTRUCTION PHASE						
▪ Well maintained vehicles should be used together with well-trained drivers during the construction phase. Vehicle maintenance and driver competency should be monitored. Proof of driver competency as well as the vehicle checks should be verified and undertaken to ensure that vehicles are roadworthy and hence, do not pose a safety risk. The Contractors must ensure that construction vehicles are roadworthy, properly serviced and maintained, and respect the vehicle safety standards implemented by the Project Developer. ▪ Plan and stagger delivery trips so that they occur during the day and minimize construction vehicle movement and delivery trips through the towns of Ceres and Touws River and on the regional road during peak traffic periods (06:00-9:00 and 16:00-18:00). ▪ Suitable parking areas should be designated for construction trucks and vehicles on the construction site in order to minimize random parking and to improve site operations. ▪ The use of public transport (buses and/or minibus taxis) to convey construction personnel to the site should be encouraged. ▪ To ensure reduced speeds along the roads, implement speed control mechanisms on site by means of a stop and go system, implement speed limits and placement of road signage for the speed limits. ▪ Adhere to all speed limits applicable to all roads used.	To be completed post EA by relevant parties					

Impact Management Outcomes: Manage impact that additional traffic generation will have on the road network. Plan the project to spread and reduce the amount of road based traffic and avoid local congestion periods during the construction phase.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
▪ Road kill monitoring programme (inclusive of wildlife collisions record keeping) should be established. ▪ Implement clear and visible signage and signals indicating movement of vehicles at intersections and in the vicinity of the nearby farm steads. The farm steads should be treated as a no-go area. ▪ Ensure that there is regular maintenance of the gravel external access roads by the contractor during the construction phase in line with the agreed and approved maintenance plan. ▪ Ensure that the upgrading of the internal farm access road is undertaken to suitable standards as specified by the civil engineer and in accordance with the approved maintenance plan. ▪ Construction activities will have a higher impact than the normal road activity and therefore the main access roads to site should be inspected on a weekly basis for structural damage. ▪ Vehicles must not be overloaded during the construction phase in order to reduce impacts on the road structures, particularly the access roads leading to the site. Random visual inspection of vehicles should be undertaken in order to monitor for overloading. The inspections should also verify if the trucks are covered with appropriate material (such as tarpaulin) if and where possible. ▪ Implement management strategies for dust generation e.g. apply dust suppressant on the gravel roads on site, exposed areas and stockpiles. ▪ Postpone or reduce dust-generating activities during periods with strong wind. Earthworks may need to be rescheduled or the frequency of application of dust control/suppressant increased. ▪ Avoid using old and unmaintained construction equipment (which generate high sound levels and greater exhaust emissions) and ensure equipment is well maintained.						

Impact Management Outcomes: Manage impact that additional traffic generation will have on the road network. Plan the project to spread and reduce the amount of road based traffic and avoid local congestion periods during the construction phase.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible Person	**Method of Implementation**	**Timeframe for Implementation**	**Responsible Person**	**Frequency**	**Evidence of Compliance**
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					
DECOMMISSIONING PHASE						
▪ Ensure that the 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

CV OF PAUL LOCHNER

Employer: Council for Scientific and Industrial Research (CSIR)
PO Box 320, Stellenbosch, 7600, South Africa
Phone: +27 21 888 2486 (w), +27 84 442 3646 (cell)
Email: plochner@csir.co.za
Date of Birth: 13 June 1969
Nationality: South African

BIOSKETCH

Paul Lochner is an environmental assessment practitioner at the CSIR in Stellenbosch, with 28 years of experience in a wide range of environmental assessment and management studies. His 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 in South Africa, and also has wide experience in Environmental & Social Impact Assessment, Environmental Management Programs and Environmental Screening Studies.

PERSONAL SKILLS AND CAPABILITIES

- Holistic understanding of environmental and social aspects at policy, program and project levels
- Ability to lead, inspire and motivate a team of environmental scientists in a consulting business
- Coordination of experts from diverse disciplines to support evidence-based decision-making
- Ability to integrate of environmental, social and economic aspects within a systems model
- Design of innovative processes to respond effectively to proposals and meet needs of clients
- Review and quality assurance for environmental assessment processes and reports
- Project management, financial management, report writing and communication skills.

EDUCATION

- BSc (Civil Engineering) awarded with Honours, *University of Cape Town*, 1990
- MPhil (Environmental Science), *University of Cape Town,* 1992

EMPLOYMENT

- Environmental scientist at CSIR (Stellenbosch) from October 1992 to present.
- Group Leader of CSIR Environmental Management Services since August 2008.

PROFESSIONAL REGISTRATION

- Environmental Assessment Practitioners Association of South Africa (EAPASA), Registration Number 2019/745

PROFESSIONAL MEMBERSHIP AND POSITIONS HELD

- Member of the International Association for Impact Assessment (IAIA)
- 1996 to present: Chairperson of Blouvlei Intaka Island Environmental Committee at Century City, Cape Town, which oversees management of the Intaka Island Nature Reserve
- 2010 to present: Chairperson of Intaka Island Environmental Trust, that oversees the operation of the Eco-centre and education program at the Intaka Island Nature Reserve
- 2017: Conference Organising Committee member and Program Director for IAIA South Africa national conference, August 2017, Goudini.

LANGUAGE CAPABILITY

	Speaking	*Reading*	*Writing*
English	Excellent	Excellent	Excellent
Afrikaans	Average	Average	Average

TRACK RECORD OF PROFESSIONAL EXPERIENCE

This is an abbreviated record of experience. A full record is available on request. Projects are located in South Africa unless otherwise stipulated.

Duration	Project description	Role	Client
2019 (in progress)	**Basic Assessments** for proposed PV and EGI Developments near Ceres	Project leader	Veroniva (PTY) Ltd
2019 (in progress)	**Environmental scoping** for a Desalination Plant and Water Carriage System for water supply to Windhoek and the central coastal area of Namibia	Project author	NamWater (Namibia) and KfW Development Bank (Germany)
2019 (in progress)	**Environmental Performance Compliance Study** for Foundries in South Africa	Project reviewer	National Foundries Technology Network
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
2017-2018	**EIA and EMP for Icyari Coltan Mine**, Rwanda	Project reviewer	Mawarid Mining Rwanda Ltd (MMRL), UAE

Duration	Project description	Role	Client
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

Duration	Project description	Role	Client
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 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*.

9 APPENDIX B – ROLES AND RESPONSIBILITIES

Responsible Person(s)	Role and Responsibilities
Developer's Project Manager (DPM)	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)	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)	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.

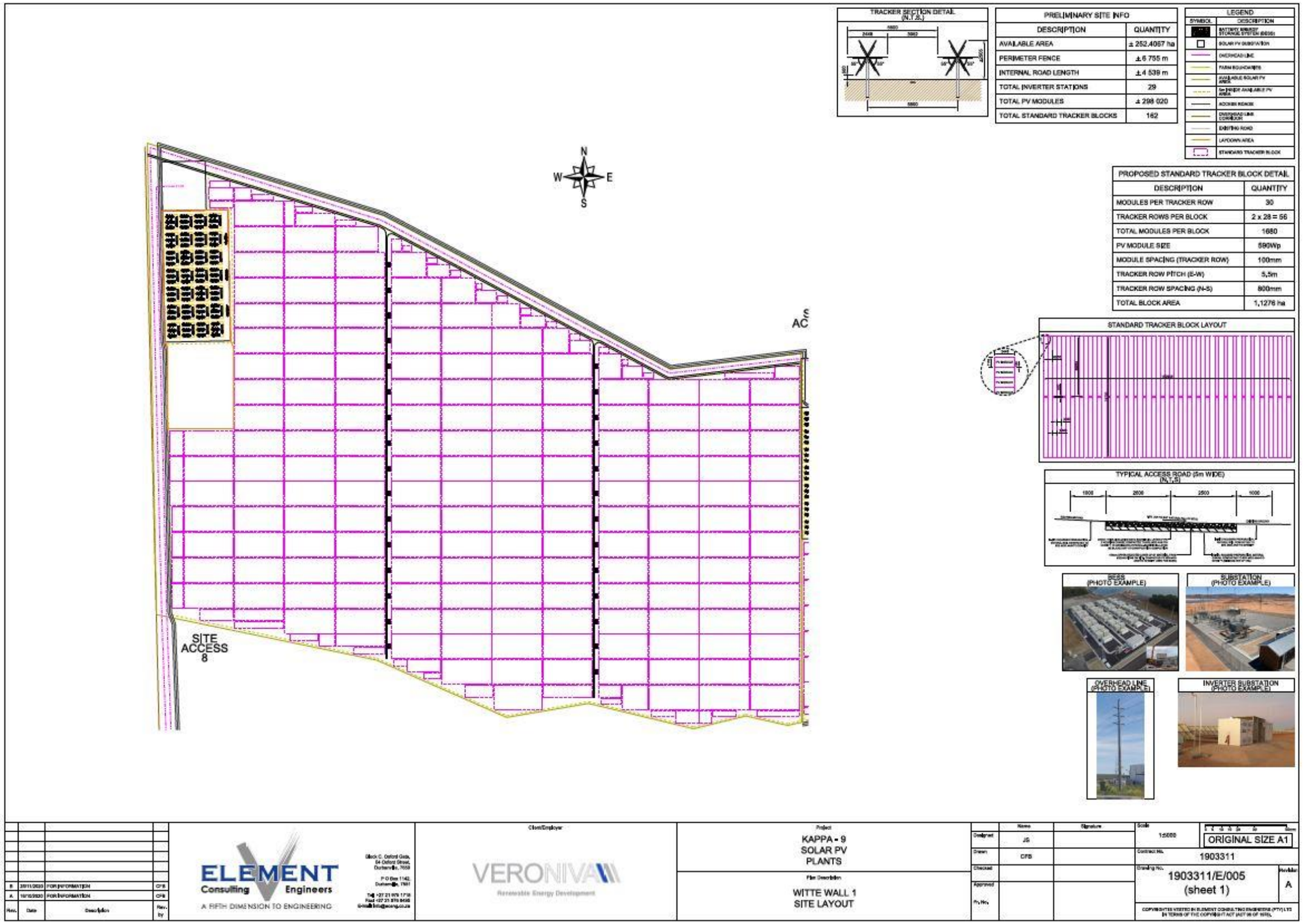
Responsible Person(s)	Role and Responsibilities
	The ECO provides feedback to the DSS and Project Manager, who in turn reports back to the Contractor and potential and Registered Interested &Affected Parties' (RI&AP's), as required. Issues of non-compliance raised by the ECO must be taken up by the Project 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. 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)	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

Responsible Person(s)	Role and Responsibilities
	of environmental coordination responsibilities. <u>Responsibilities</u> - 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; - 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	<u>Role</u> 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. <u>Responsibilities</u> - 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)	<u>Role</u> 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

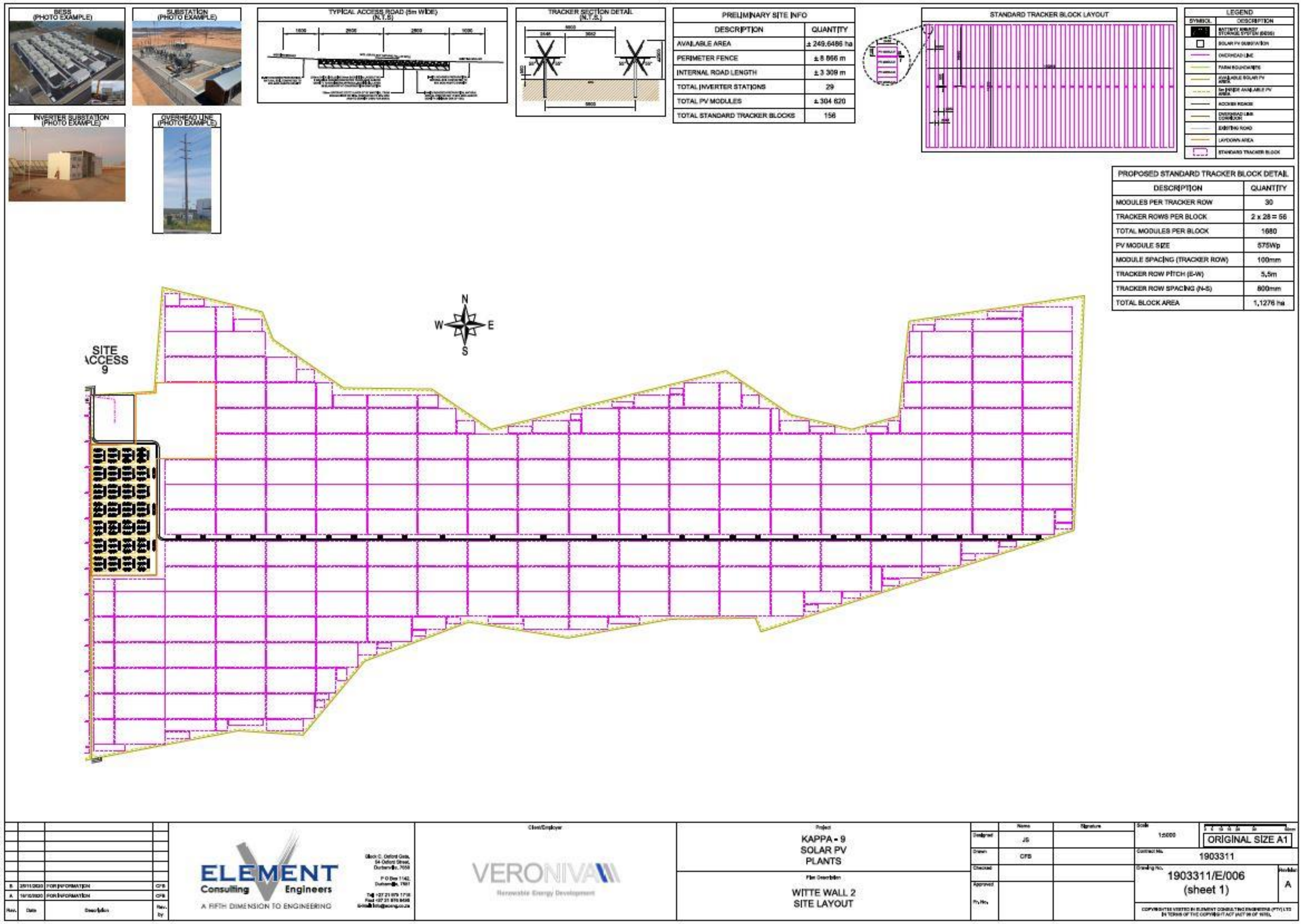
Responsible Person(s)	Role and Responsibilities
	minimum the cEO shall meet the following criteria: <u>Responsibilities</u> - Be on site throughout the duration of the project and be dedicated to the project; - Ensure all their staff are aware of the environmental requirements, conditions and constraints 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

WITTE WALL PV 1



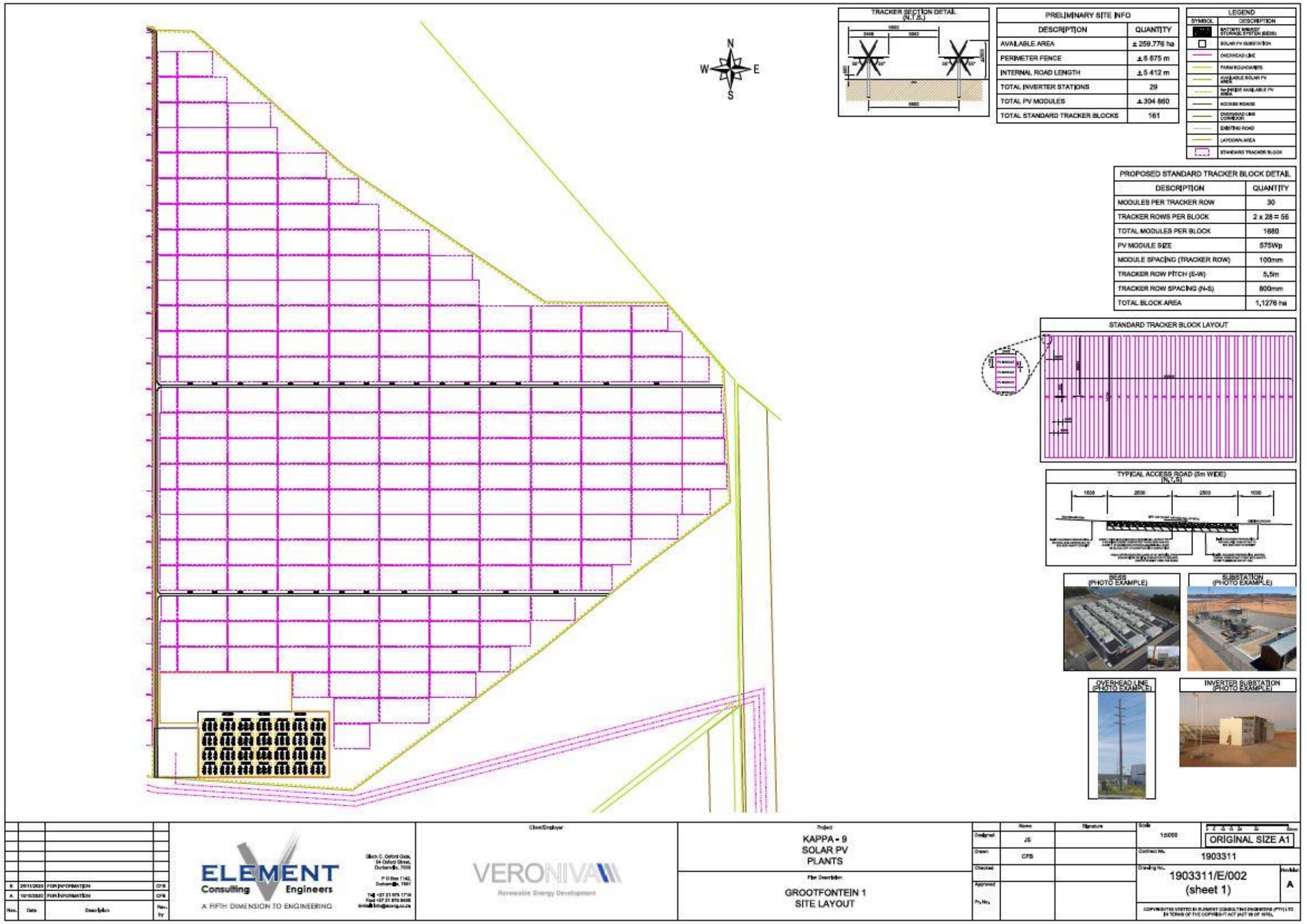
WITTE WALL PV 2


BESS (PHOTO EXAMPLE)
SUBSTATION (PHOTO EXAMPLE)
TYPICAL ACCESS ROAD (5m WIDE)
TRACKER SECTION DETAIL (N.T.S)
STANDARD TRACKER BLOCK LAYOUT
LEGEND
INVERTER SUBSTATION (PHOTO EXAMPLE)
OVERHEAD LINE (PHOTO EXAMPLE)
N
W
E
S
SITE ACCESS 9
KAPPA - 9 SOLAR PV PLANTS
WITTE WALL 2 SITE LAYOUT
ELEMENT Consulting Engineers
A FIFTH DIMENSION TO ENGINEERING
VERONIVA
Renewable Energy Development
Designed JS
Drawn CFB
Scale 1:5000
ORIGINAL SIZE A1
Contract No. 1903311
Drawing No. 1903311/E/006 (sheet 1)
Revision A
B 25/11/2020 FOR INFORMATION CFB
A 16/10/2020 FOR INFORMATION CFB

PRELIMINARY SITE INFO	
DESCRIPTION	QUANTITY
AVAILABLE AREA	± 249.6486 ha
PERIMETER FENCE	± 8 866 m
INTERNAL ROAD LENGTH	± 3 309 m
TOTAL INVERTER STATIONS	29
TOTAL PV MODULES	± 304 620
TOTAL STANDARD TRACKER BLOCKS	156

PROPOSED STANDARD TRACKER BLOCK DETAIL	
DESCRIPTION	QUANTITY
MODULES PER TRACKER ROW	30
TRACKER ROWS PER BLOCK	2 x 28 = 56
TOTAL MODULES PER BLOCK	1680
PV MODULE SIZE	575Wp
MODULE SPACING (TRACKER ROW)	100mm
TRACKER ROW PITCH (E-W)	5,5m
TRACKER ROW SPACING (N-S)	800mm
TOTAL BLOCK AREA	1,1276 ha

GROOTFONTEIN PV 1



GROOTFONTEIN PV 2

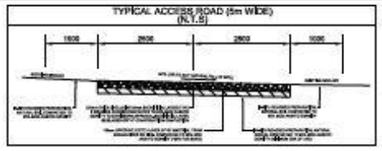
BESS (PHOTO EXAMPLE)

SUBSTATION (PHOTO EXAMPLE)

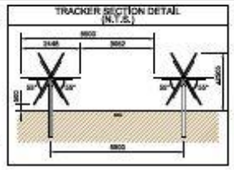
INVERTER SUBSTATION (PHOTO EXAMPLE)

OVERHEAD LINE (PHOTO EXAMPLE)

TYPICAL ACCESS ROAD (6m WIDE) (N.T.S)

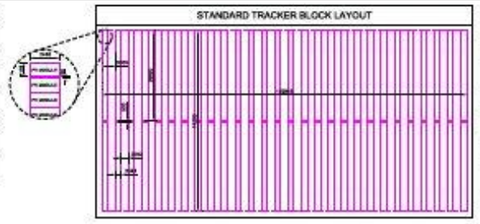


TRACKER SECTION DETAIL (N.T.S.)



PRELIMINARY SITE INFO	
DESCRIPTION	QUANTITY
AVAILABLE AREA	± 253,6656 ha
PERIMETER FENCE	± 7 684 m
INTERNAL ROAD LENGTH	± 4 131 m
TOTAL INVERTER STATIONS	29
TOTAL PV MODULES	± 304 380
TOTAL STANDARD TRACKER BLOCKS	179

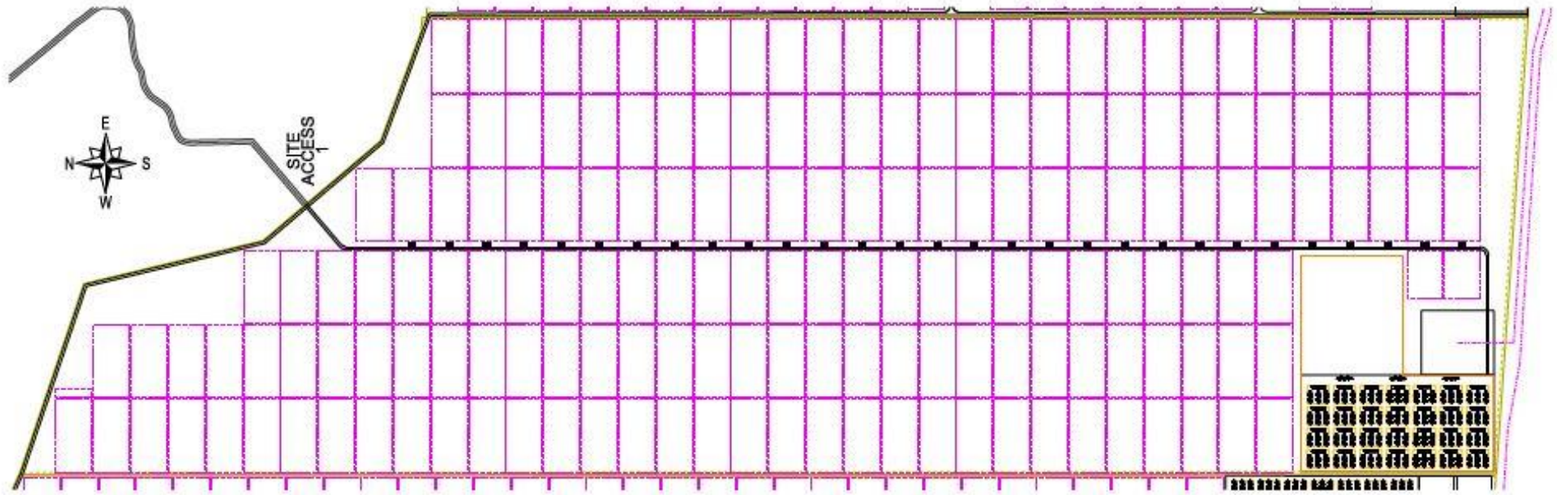
STANDARD TRACKER BLOCK LAYOUT



LEGEND

SYMBOL	DESCRIPTION
	BATTERY ENERGY STORAGE SYSTEM (BESS)
	SOLAR PV SUBSTATION
	OVERHEAD LINE
	FARM BOUNDARIES
	AVAILABLE SOLAR PV AREA
	5m BUFFER AVAILABLE PV AREA
	ACCESS ROADS
	OVERHEAD LINE CONNECTION
	EXISTING ROAD
	LAYDOWN AREA
	STANDARD TRACKER BLOCK

PROPOSED STANDARD TRACKER BLOCK DETAIL	
DESCRIPTION	QUANTITY
MODULES PER TRACKER ROW	30
TRACKER ROWS PER BLOCK	2 x 28 = 56
TOTAL MODULES PER BLOCK	1680
PV MODULE SIZE	575Wp
MODULE SPACING (TRACKER ROW)	100mm
TRACKER ROW PITCH (E-W)	5,5m
TRACKER ROW SPACING (N-S)	800mm
TOTAL BLOCK AREA	1,1276 ha



Rev.	Date	Description	Rev. by
B	25/11/2020	FOR INFORMATION	CFS
A	19/10/2020	FOR INFORMATION	CFS

ELEMENT Consulting Engineers
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Fax: +27 21 975 9456
Email: info@ecoeng.co.za

Client/Employer: VERONIVA Renewable Energy Development

Project: KAPPA - 9 SOLAR PV PLANTS

File Description: GROOTFONTEIN 2 SITE LAYOUT

	Name	Signature
Designed	JS	
Drawn	CFS	
Checked		
Approved		
Pr.Nr.		

Scale: 1:2000 — ORIGINAL SIZE A1

Contract No.: 1903311

Drawing No.: 1903311/E/003 (sheet 1)

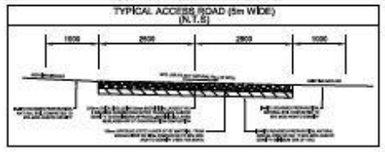
Rev/Mod: A

GROOTFONTEIN PV 3

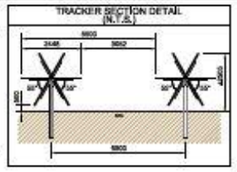
BESS (PHOTO EXAMPLE)

SUBSTATION (PHOTO EXAMPLE)

TYPICAL ACCESS ROAD (5m WIDE) (N.T.S.)

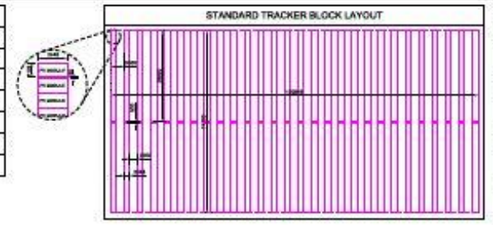


TRACKER SECTION DETAIL (N.T.S.)



PRELIMINARY SITE INFO	
DESCRIPTION	QUANTITY
AVAILABLE AREA	± 255.976 ha
PERIMETER FENCE	± 7 469 m
INTERNAL ROAD LENGTH	± 3 636 m
TOTAL INVERTER STATIONS	29
TOTAL PV MODULES	± 304 560
TOTAL STANDARD TRACKER BLOCKS	167

STANDARD TRACKER BLOCK LAYOUT



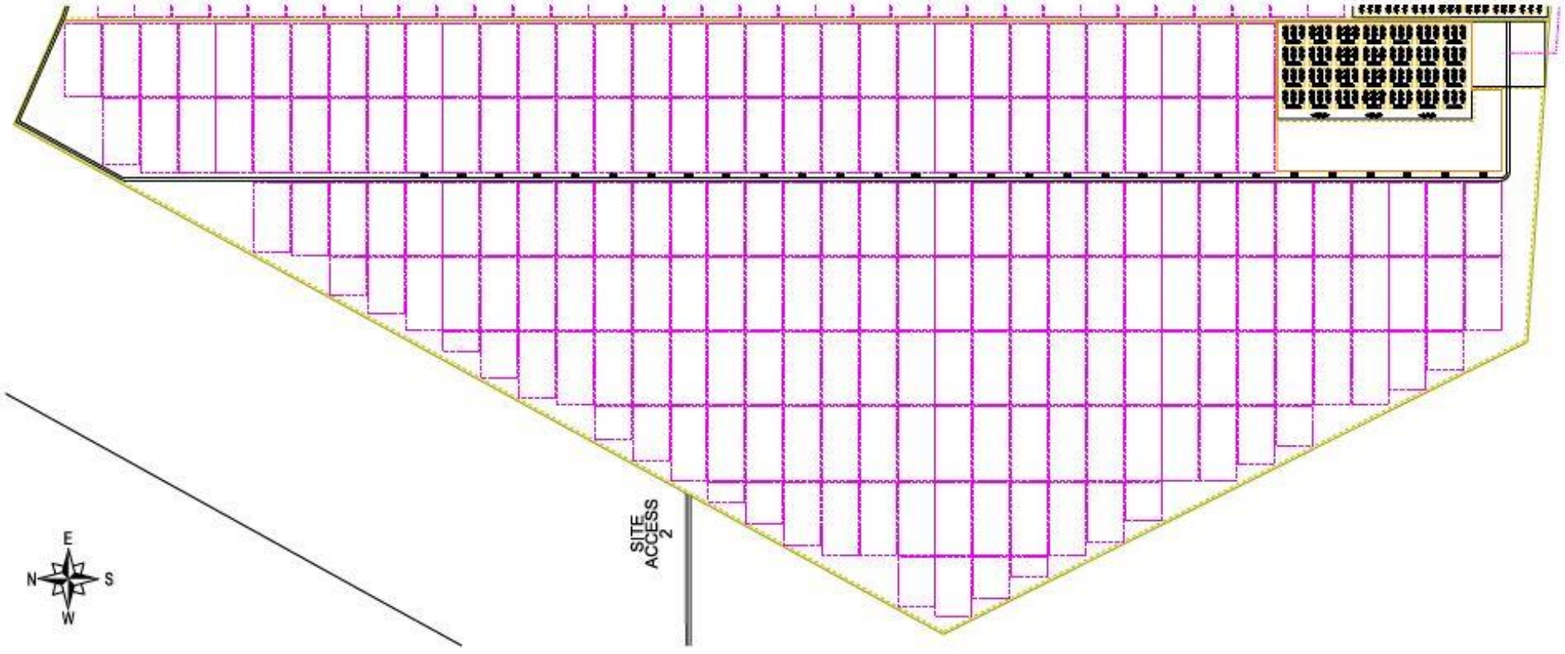
LEGEND

SYMBOL	DESCRIPTION
	BATTERY ENERGY STORAGE SYSTEM (BESS)
	SOLAR PV DISPOSITION
	OVERHEAD LINE
	FARM BOUNDARIES
	AVAILABLE SOLAR PV AREA
	5m [INSIDE AVAILABLE PV AREA]
	ROCKIES RIDGE
	ENDERHEAD LINE CORRIDOR
	EXISTING ROAD
	LAYDOWN AREA
	STANDARD TRACKER BLOCK

INVERTER SUBSTATION (PHOTO EXAMPLE)

OVERHEAD LINE (PHOTO EXAMPLE)

PROPOSED STANDARD TRACKER BLOCK DETAIL	
DESCRIPTION	QUANTITY
MODULES PER TRACKER ROW	30
TRACKER ROWS PER BLOCK	2 x 28 = 56
TOTAL MODULES PER BLOCK	1680
PV MODULE SIZE	575Wp
MODULE SPACING (TRACKER ROW)	100mm
TRACKER ROW PITCH (E-W)	5,5m
TRACKER ROW SPACING (N-S)	800mm
TOTAL BLOCK AREA	1,1276 ha



Rev.	Date	Description	Rev. by
B	20/11/2020	FOR INFORMATION	CFB
A	19/10/2020	FOR INFORMATION	CFB

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Client/Employer: VERONIVA Renewable Energy Development

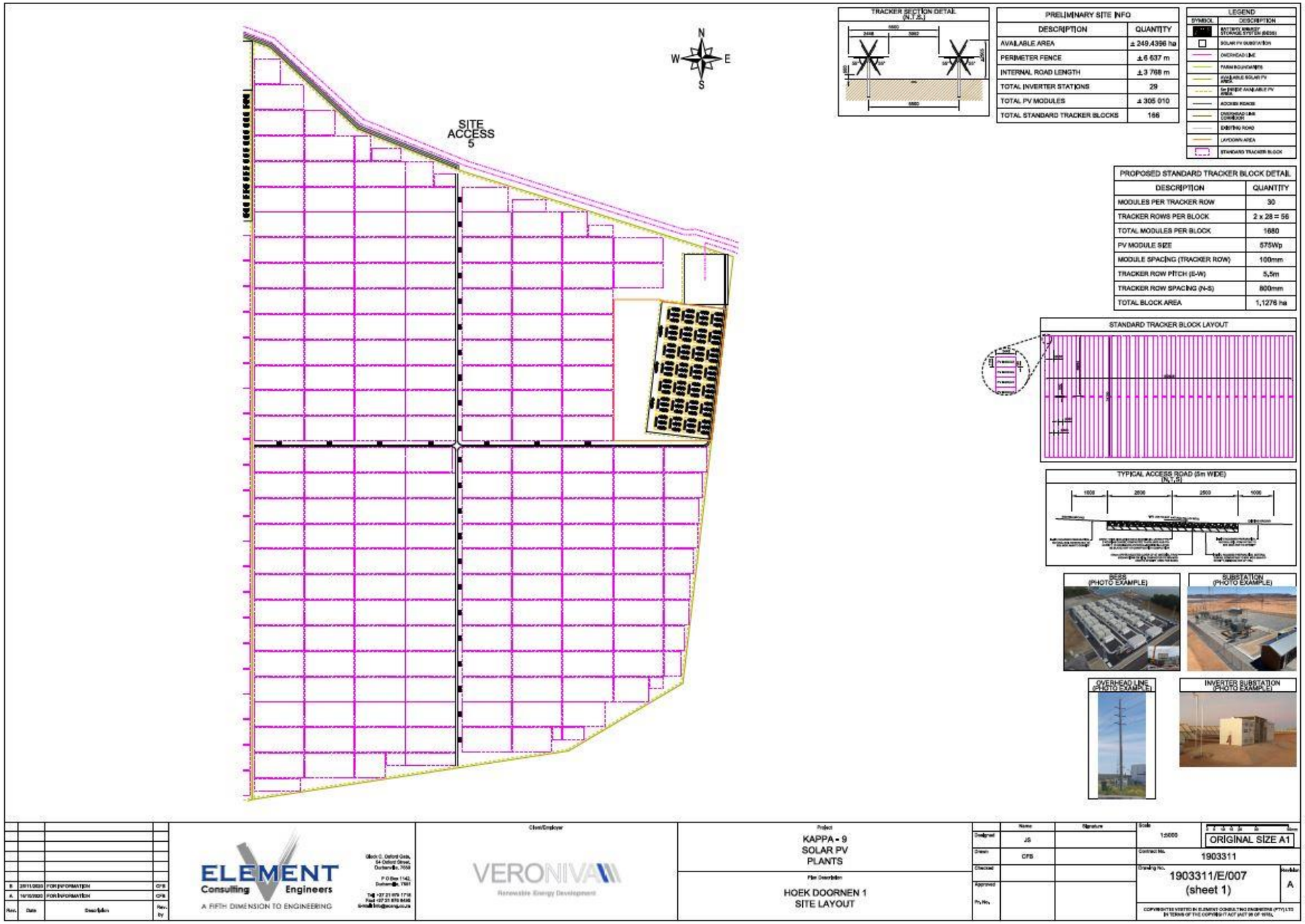
Project: KAPPA - 9 SOLAR PV PLANTS

Plan Description: GROOTFONTEIN 3 SITE LAYOUT

	Name	Signature
Designed	JS	
Drawn	CFB	
Checked		
Approved		
Pr.Nat.		

Scale: 1:5000 (0 50 100 150 200 250 300mm)
ORIGINAL SIZE A1
Contract No.: 1903311
Drawing No.: 1903311/E/004 (sheet 1)
Revision: A

HOEK DOORNEN PV 1

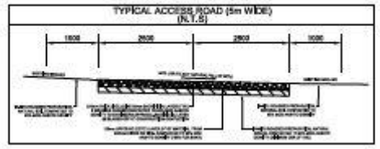


HOEK DOORNEN PV 2

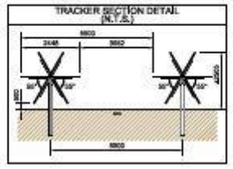
BESS (PHOTO EXAMPLE)

SUBSTATION (PHOTO EXAMPLE)

TYPICAL ACCESS ROAD (5m WIDE) (N.T.S.)

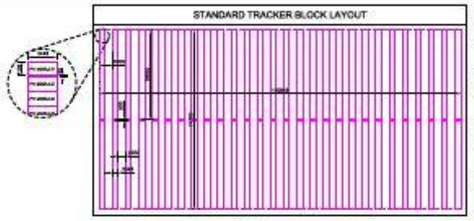


TRACKER SECTION DETAIL (N.T.S.)



PRELIMINARY SITE INFO	
DESCRIPTION	QUANTITY
AVAILABLE AREA	± 249.554 ha
PERIMETER FENCE	± 6 861 m
INTERNAL ROAD LENGTH	± 3 000 m
TOTAL INVERTER STATIONS	29
TOTAL PV MODULES	± 304 500
TOTAL STANDARD TRACKER BLOCKS	165

STANDARD TRACKER BLOCK LAYOUT



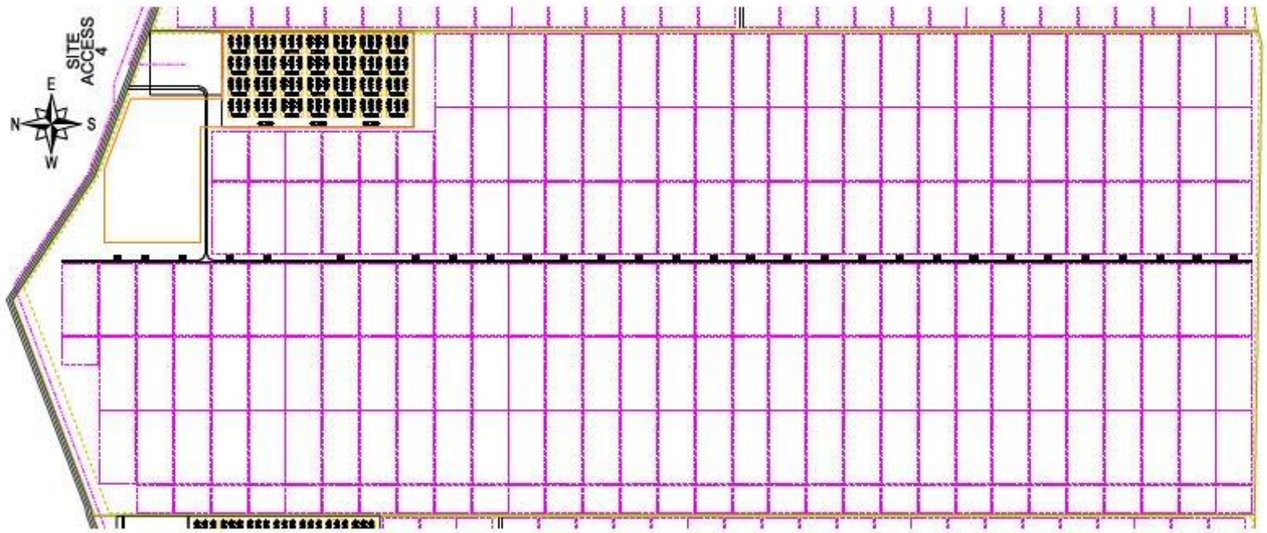
LEGEND

SYMBOL	DESCRIPTION
	BATTERY ENERGY STORAGE SYSTEM (BESS)
	SOLAR PV SUBSTATION
	OVERHEAD LINE
	FARM BOUNDARIES
	AVAILABLE SOLAR PV AREA
	5m BARRIER AVAILABLE PV AREA
	ACCESS ROADS
	OVERHEAD LINE CORRIDOR
	EXISTING ROAD
	LAYDOWN AREA
	STANDARD TRACKER BLOCK

INVERTER SUBSTATION (PHOTO EXAMPLE)

OVERHEAD LINE (PHOTO EXAMPLE)

PROPOSED STANDARD TRACKER BLOCK DETAIL	
DESCRIPTION	QUANTITY
MODULES PER TRACKER ROW	30
TRACKER ROWS PER BLOCK	2 x 28 = 56
TOTAL MODULES PER BLOCK	1680
PV MODULE SIZE	575Wp
MODULE SPACING (TRACKER ROW)	100mm
TRACKER ROW PITCH (E-W)	5,5m
TRACKER ROW SPACING (N-S)	800mm
TOTAL BLOCK AREA	1,1276 ha



Rev.	Date	Description	Rev. by
B	20/11/2020	FOR INFORMATION	CFB
A	19/10/2020	FOR INFORMATION	CFB

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E-mail: info@elemeng.co.za

Client/Employer: VERONIVA Renewable Energy Development

Project: KAPPA - 9 SOLAR PV PLANTS

File Description: HOEK DOORNEN 2 SITE LAYOUT

	Name	Signature
Designed	JS	
Drawn	CFB	
Checked		
Approved		
Pr.Nr.		

Scale: 1:5000

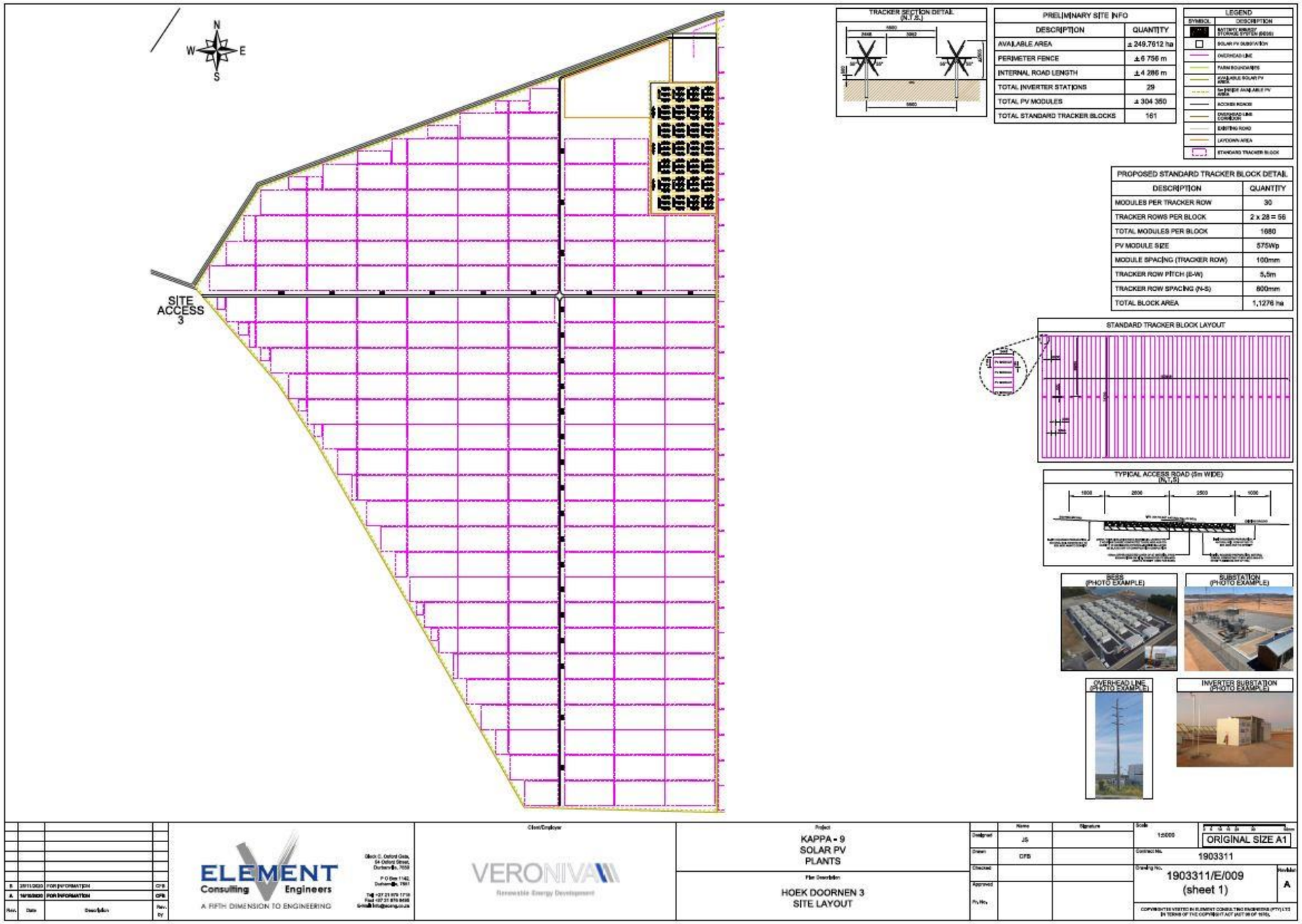
ORIGINAL SIZE A1

Contract No.: 1903311

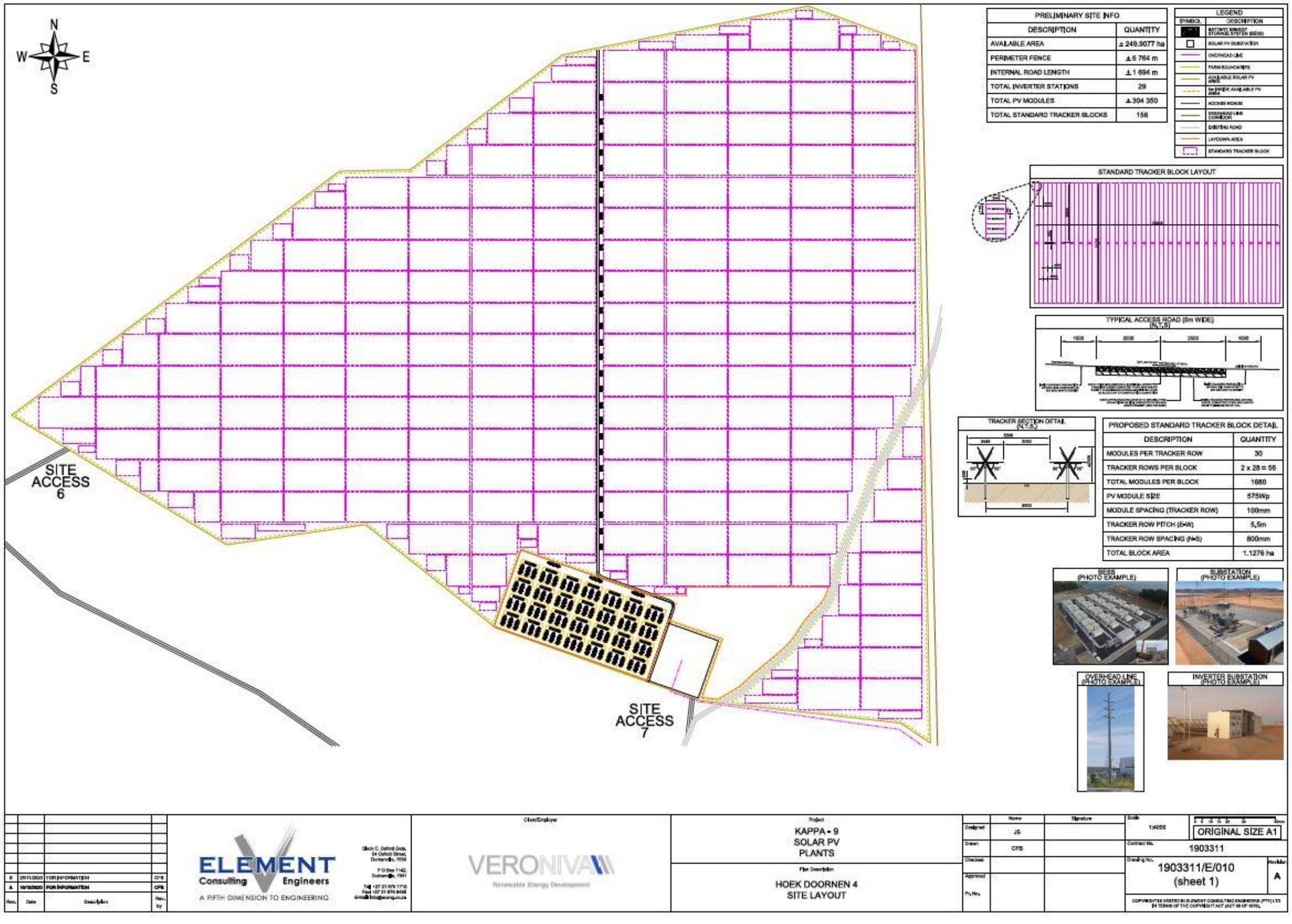
Drawing No.: 1903311/E/008 (sheet 1)

Revision: A

HOEK DOORNEN PV 3

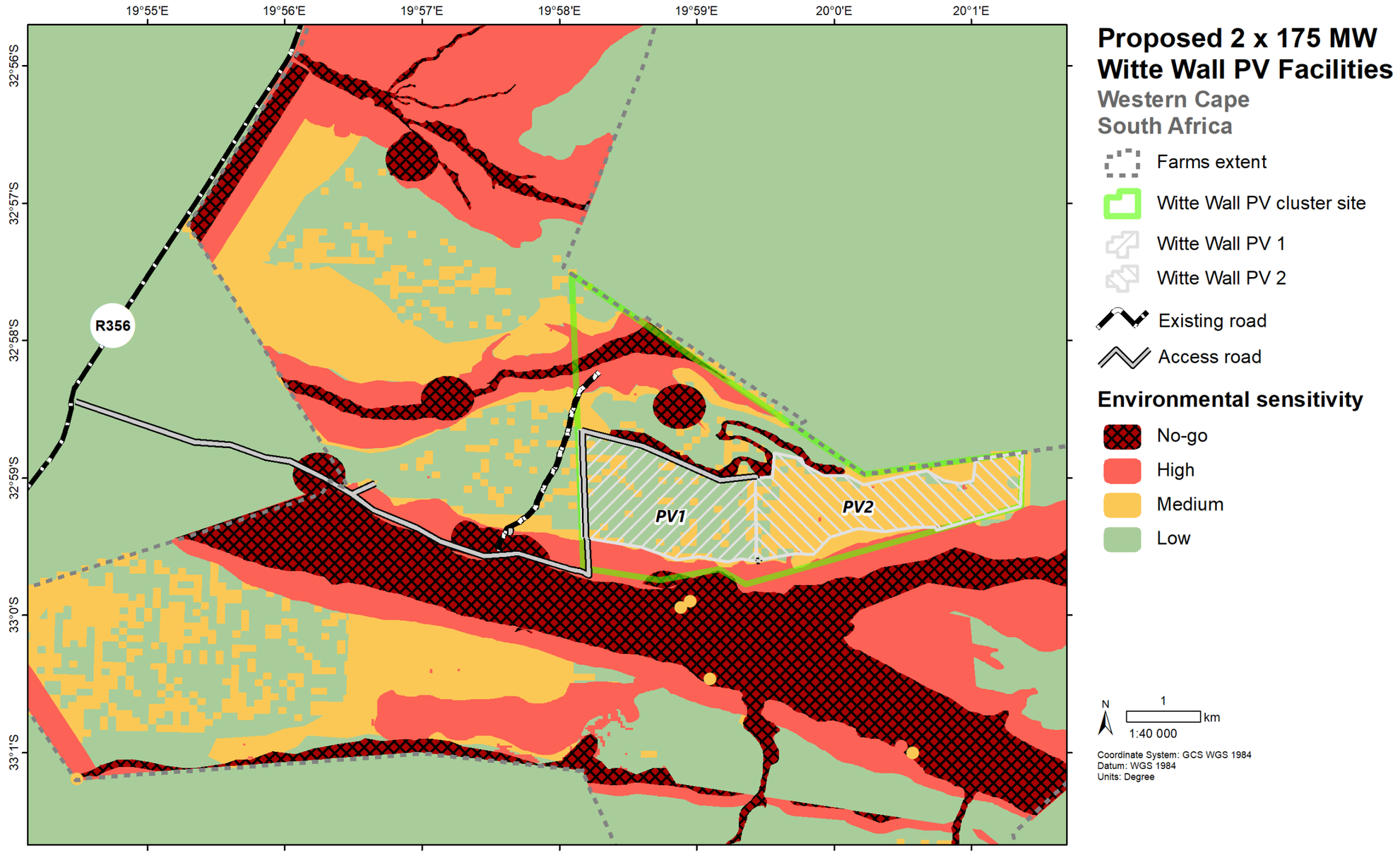


HOEK DOORNEN PV 4

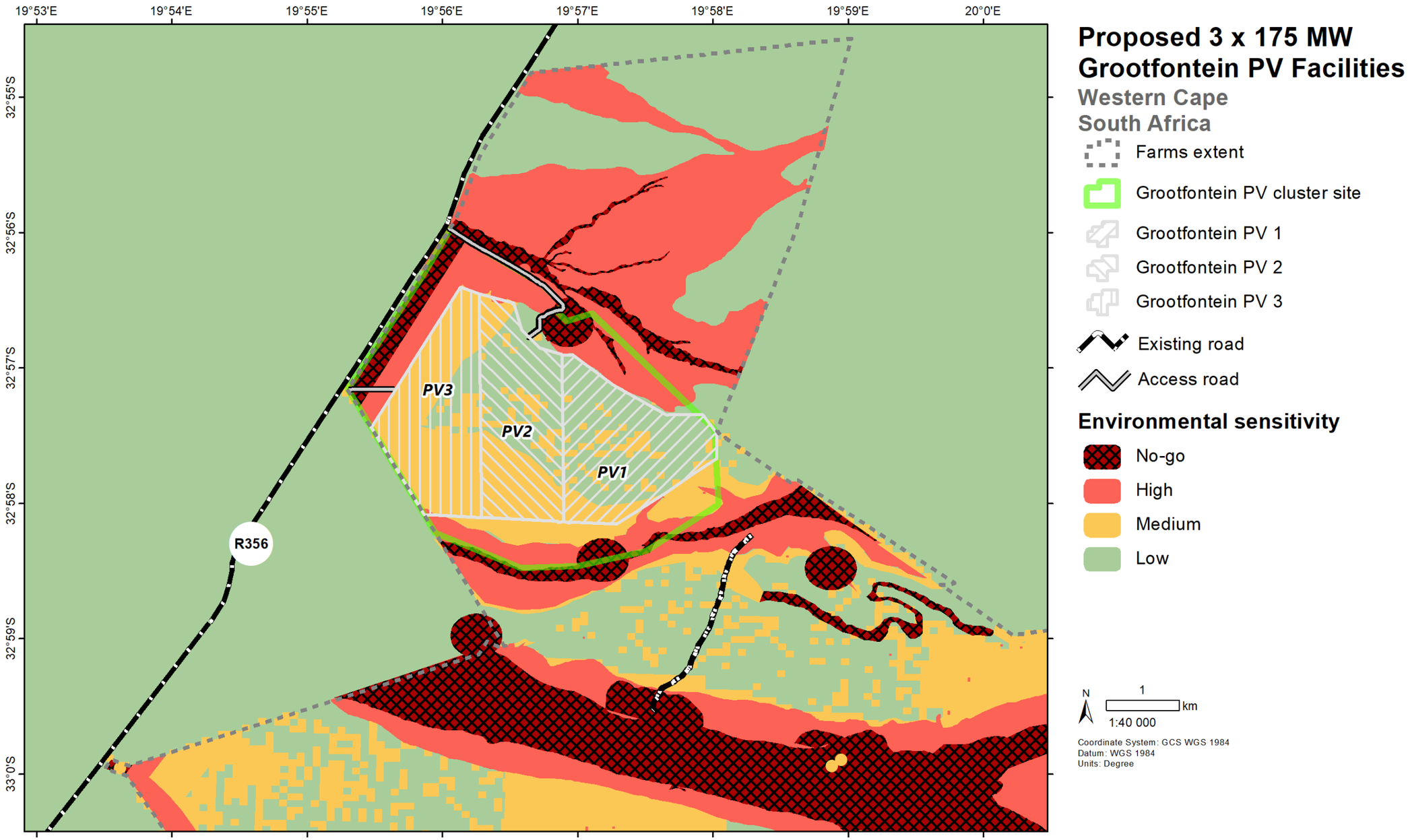


11 APPENDIX D – COMBINED LAYOUT AND SENSITIVITY MAP

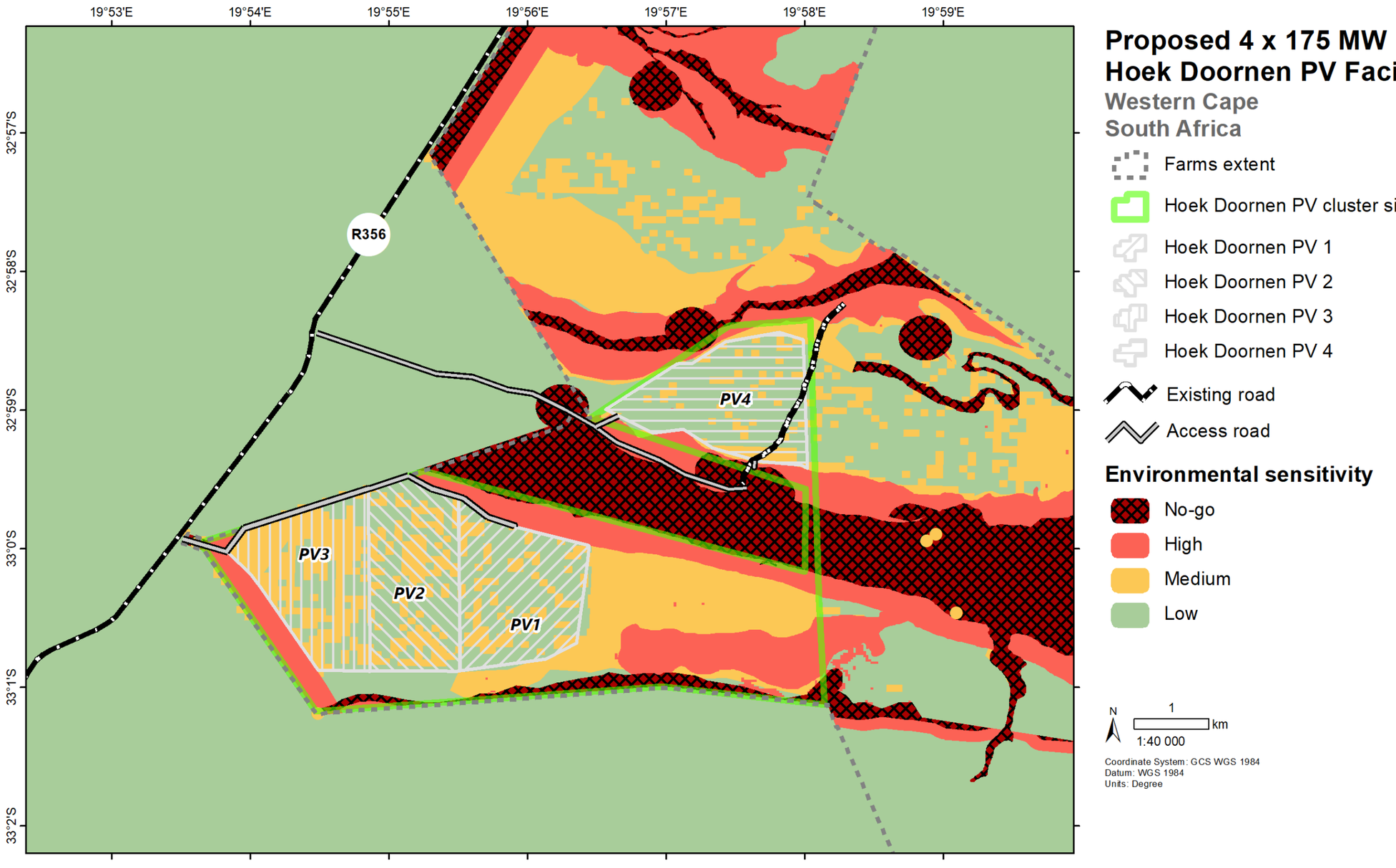
WITTE WALL PV 1 AND WITTE WALL PV 2



GROOTFONTEIN PV 1, GROOTFONTEIN PV 2 AND GROOTFONTEIN PV 3



HOEK DOORNEN PV 1, HOEK DOORNEN PV 2, HOEK DOORNEN PV 3 AND HOEK DOORNEN PV 4



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

PRE-APPROVED GENERIC EMPR TEMPLATE FOR SUBSTATION INFRASTRUCTURE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICITY 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 substation infrastructure for the transmission and distribution of electricity. There is a list of aspects identified for the development or expansion of substation infrastructure for the transmission and distribution of electricity, 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 substation infrastructure for the transmission and distribution of electricity.

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,						

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
and the posters must include the following information as a minimum: a) Safety notifications; and b) No littering. – 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						

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
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
– An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with 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 a 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 the development activities;						

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
– Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where applicable; – Any temporary fencing to restrict the movement of life-stock must only be erected with the permission of the land owner. – 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 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: Wastes are 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;						

Impact management outcome: Wastes are 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
– 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						

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
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 relevant CA 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						

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
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***. Alien invasive vegetation must be removed and disposed of at a licensed waste management facility.						

5.11. Protection of fauna

Impact management outcome: Disturbance to fauna is minimised.						
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; – Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds; – 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; – 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: Impact to heritage resources is minimised.						
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; – 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;						

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
– 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;						

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
– 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; – 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						

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
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

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						

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
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: Prevent unnecessary noise to the environment by ensuring that noise from development activity 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						

Impact Management outcome: Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
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: Reduce erosion and sedimentation as a result of stockpiling.						
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;						

Impact management outcome: Reduce erosion and sedimentation as a result of stockpiling.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– 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. Civil works

Impact management outcome: Impact to the environment minimised during civil works to create the substation terrace.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Where terracing is required, topsoil must be collected and retained for the purpose of re-use later to rehabilitate disturbed areas not covered by yard stone; – Areas to be rehabilitated include terrace embankments and areas outside the high voltage yards; – Where required, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; – These areas can be 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; – Rehabilitation of the disturbed areas must be managed in accordance with ***Section 5.35: Landscaping and rehabilitation***; – All excess spoil generated during terracing activities must be disposed of in an appropriate manner and at a recognised landfill site; and – Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes.						

5.26. Excavation of foundation, cable trenching and drainage systems

Impact management outcome: No environmental degradation occurs as a result of excavation of foundation, cable trenching and drainage systems.		
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 licensed landfill 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***.						

5.27. Installation of foundations, cable trenching and drainage systems

Impact management outcome: No environmental degradation occurs during the installation of foundation, cable trenching and drainage system.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Batching of cement to be undertaken in accordance with **Section *5.19: Batching plants***; and – Residual solid waste must be disposed of in accordance with **Section *5.8: Solid waste and hazardous management***.						

5.28. Installation of equipment (circuit breakers, current Transformers, Isolators, Insulators, surge arresters, voltage transformers, earth switches)

Impact management outcome: No environmental degradation occurs as a result of installation of equipment.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Management of dust must be conducted in accordance with Section ***5. 20: Dust emissions***; – Management of equipment used for installation must be conducted in accordance with Section **5*.18: Workshop, equipment maintenance and storage***; – Management hazardous substances and any associated spills must be conducted in accordance with Section ***5.17: Hazardous substances***; and – Residual solid waste must be recycled or disposed of in accordance with ***Section 5.8: Solid waste and hazardous management***.						

5.29. Steelwork Assembly and Erection

Impact management outcome: No environmental degradation occurs as a result of steelwork assembly and erection.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– During assembly, care must be taken to ensure that no wasted/unused materials are left on site e.g. bolts and nuts – Emergency repairs due to breakages of equipment must be managed in accordance with ***Section 5. 18: Workshop, equipment maintenance and storage*** and ***Section 5.16: Emergency procedures***.						

5.30. Cabling and 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
– Residual solid waste (off cuts etc.) shall be recycled or disposed of in accordance with **Section *6.8: Solid waste and hazardous Management***; – Management of equipment used for installation shall be conducted in accordance with **Section 5*.18: Workshop, equipment maintenance and storage***; – Management hazardous substances and any associated spills shall be conducted in accordance with ***Section 5.17: Hazardous substances***.						

5.31. Testing and Commissioning (all equipment testing, earthing system, system integration)

Impact management outcome: No environmental degradation occurs as a result of Testing and Commissioning.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Residual solid waste must be recycled or disposed of in accordance with ***Section 5.8: Solid waste and hazardous management***.						

5.32. Socio-economic

Impact management outcome: enhanced socio-economic development.

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.						

5.33. 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: 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; – Drip trays must have been emptied and secured.						

5.34. Dismantling of old equipment

Impact management outcome: Impact to the environment to be minimised during the dismantling, storage and disposal of old equipment commissioning.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All old equipment removed during the project must be stored in such a way as to prevent pollution of the environment; – Oil containing equipment must be stored to prevent leaking or be stored on drip trays; – All scrap steel must be stacked neatly and any disused and broken insulators must be stored in containers; – Once material has been scrapped and the contract has been placed for removal, the disposal Contractor must ensure that any equipment containing pollution causing substances is dismantled and transported in such a way as to prevent spillage and pollution of the environment; – The Contractor must also be equipped to contain and clean up any pollution causing spills; and – Disposal of unusable material must be at a licensed waste disposal site.						

5.35. 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 of to a registered waste site; – 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;						

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
– Rehabilitation of 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; – 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.