

18MW HARMONY JOEL SOLAR PHOTOVOLTAIC (PV) FACILITY, FREE STATE PROVINCE

Environmental Management Programme (EMPr)

May 2023

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PROJECT DETAILS

| | | |
|-----------------------|---|--|
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DEFINITIONS AND TERMINOLOGY

Alien species: A species that is not indigenous to the area or out of its natural distribution range.

Alternatives: Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process, or technology alternatives, temporal alternatives or the 'do nothing' alternative.

Ambient sound level: The reading on an integrating impulse sound level meter taken at a measuring point in the absence of any alleged disturbing noise at the end of a total period of at least 10 minutes after such meter was put into operation.

Assessment: The process of collecting, organising, analysing, interpreting and communicating information which is relevant.

Biological diversity: The variables among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes they belong to.

Commence: The start of any physical activity, including site preparation and any other activity on site furtherance of a listed activity or specified activity, but does not include any activity required for the purposes of an investigation or feasibility study as long as such investigation or feasibility study does not constitute a listed activity or specified activity.

Construction: Construction means the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity as per the EIA Regulations. Construction begins with any activity which requires Environmental Authorisation.

Cumulative impacts: Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impacts of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period and can include both direct and indirect impacts.

Decommissioning: To take out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily re-commissioned. This usually occurs at the end of the life of a facility.

Direct impacts: Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation, or maintenance of an activity and are generally obvious and quantifiable.

'Do nothing' alternative: The 'do nothing' alternative is the option of not undertaking the proposed activity or any of its alternatives. The 'do nothing' alternative also provides the baseline against which the impacts of other alternatives should be compared.

Ecosystem: A dynamic system of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.

Endangered species: Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included here are taxa whose numbers of individuals have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to be in immediate danger of extinction.

Endemic: An "endemic" is a species that grows/occur in a particular area (is endemic to that region) and has a restricted distribution. It is only found in a particular place. Whether something is endemic or not depends on the geographical boundaries of the area in question and the area can be defined at different scales.

Environment: the surroundings within which humans exist and that are made up of:

- (i) The land, water and atmosphere of the earth;
- (ii) Micro-organisms, plant and animal life;
- (iii) Any part or combination of (i) and (ii) and the interrelationships among and between them; and
- (iv) The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental assessment practitioner (EAP): An individual responsible for the planning, management and coordinating of environmental management plan or any other appropriate environmental instruments introduced by legislation.

Environmental Control Officer (ECO): An individual appointed by the holder of the EA prior to the commencement of any authorised activities, responsible for monitoring, reviewing and verifying compliance by the EPC Contractor with the environmental specifications of the EMPr and the conditions of the Environmental Authorisation. The ECO reports directly to the Authority who issued to Environmental Authorisation.

Environmental impact: An action or series of actions that have an effect on the environment.

Environmental impact assessment: Environmental Impact Assessment, as defined in the NEMA EIA Regulations, is a systematic process of identifying, assessing and reporting environmental impacts associated with an activity.

Environmental management: Ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental management programme (EMPr): A plan that organises and co-ordinates mitigation, rehabilitation and monitoring measures in order to guide the implementation of a proposal and its on-going maintenance after implementation.

Environmental Officer (EO): The Environmental Officer (EO) is responsible for managing the day-to-day on-site implementation of this EMPr, and for the compilation of regular (usually weekly) Monitoring Reports. The EO must act as liaison and advisor on all environmental and related issues and ensure that any complaints received from the public are duly recorded and forwarded to the Site Manager and Contractor.

Habitat: The place in which a species or ecological community occurs naturally.

Hazardous waste: Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.

Incident: Section 30 of NEMA defines an 'incident' as "an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed."¹

Indigenous: All biological organisms that occurred naturally within the study area prior to 1800.

Indirect impacts: Indirect or induced changes that may occur because of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken, or which occur at a different place because of the activity.

Interested and affected party: Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups, and the public.

Mitigation hierarchy: The mitigation hierarchy is a framework for managing risks and potential impacts related to biodiversity and ecosystem services. The mitigation hierarchy is used when planning and implementing development projects, to provide a logical and effective approach to protecting and conserving biodiversity and maintaining important ecosystem services. It is a tool to aid in the sustainable management of living, natural resources, which provides a mechanism for making explicit decisions that balance conservation needs with development priorities

Pollution: A change in the environment caused by substances (radio-active or other waves, noise, odours, dust or heat emitted from any activity, including the storage or treatment or waste or substances.

Pre-construction: The period prior to the commencement of construction, which may include activities which do not require Environmental Authorisation (e.g. geotechnical surveys).

Rare species: Taxa with small world populations that are not at present Endangered or Vulnerable but are at risk as some unexpected threat could easily cause a critical decline. These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a more extensive range. This category was termed Critically Rare by Hall and Veldhuis (1985) to distinguish it from the more generally used word "rare."

¹<http://ipwis.pgwc.gov.za/ipwisdoc/Public/Publications/ChemicalsMgt/A%20Procedure%20for%20Section%2030%20of%20NEMA.pdf>

Red data species: Species listed in terms of the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species, and/or in terms of the South African Red Data list. In terms of the South African Red Data list, species are classified as being extinct, endangered, vulnerable, rare, indeterminate, insufficiently known or not threatened (see other definitions within this glossary).

Significant impact: An impact that by its magnitude, duration, intensity, or probability of occurrence may have a notable effect on one or more aspects of the environment.

Vulnerable species: A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future.

Waste: Any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to the Waste Amendment Act (as amended on June 2014); or any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister.

ABBREVIATIONS AND ACRONYMS

| | |
|-----------------|--|
| DFFE | National Department of Forestry, Fisheries and the Environment |
| DWS | Department of Water and Sanitation |
| EAP | Environmental Assessment Practitioner |
| ECO | Environmental Control Officer |
| EIA | Environmental Impact Assessment |
| EMPr | Environmental Management Programme |
| EO | Environmental Officer |
| EPC | Engineering Procurement Contractor |
| GG | Government Gazette |
| GN | Government Notice |
| Ha | Hectare |
| I&AP | Interested and Affected Party |
| km ² | Square kilometres |
| kV | Kilovolt |
| m ² | Square meters |
| m/s | Meters per second |
| MW | Mega Watt |
| NEMA | National Environmental Management Act (Act No 107 of 1998) |
| NHRA | National Heritage Resources Act (Act No 25 of 1999) |
| NIRP | National Integrated Resource Planning |
| NWA | National Water Act (Act No 36 of 1998) |
| PM | Project Manager |
| PV | Photovoltaic |
| REDZ | Renewable Energy Development Zone(s) |
| SHE | Safety, Health and Environment |
| SAHRA | South African Heritage Resources Agency |
| SANRAL | South African National Roads Agency Limited |

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CHAPTER 1: INTRODUCTION

This Environmental Management Programme has been compiled for the Harmony Joel Solar PV Facility. The site is located 900m north east of the Harmony Joel operations, approximately ~20km north east of the town of Theunissen within the Masilonyana Local Municipality and within the Lejweleputswa District Municipality, Free State Province. The Harmony Joel Solar PV Facility will have a contracted capacity of up to 18MW and is to be constructed over an area of approximately 47ha (development footprint) in extent.

This EMPr has been developed on the basis of the findings of the Environmental Impact Assessment (EIA) and must be implemented to protect sensitive on-site and off-site features through controlling construction, operation and decommissioning activities that could have a detrimental effect on the environment, and through avoiding or minimising potential impacts. This EMPr is applicable to all Freegold Harmony (Pty) Ltd employees and contractors working on the pre-construction, construction, and operation and maintenance phases of the Harmony Joel Solar PV Facility. The document must be adhered to and updated as relevant throughout the project life cycle. This document fulfils the requirement of the EIA Regulations, 2014 (as amended) and forms part of the EIA report of the project.

In terms of the Duty of Care provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with this project is avoided, halted or minimised. In terms of NEMA, it has become the legal duty of a project proponent to consider a project holistically, and to consider the cumulative effect of a variety of impacts.

CHAPTER 2: PROJECT DETAILS

The site is located 900m north east of the Harmony Joel operations, approximately ~20km north east of the town of Theunissen within the Masilonyana Local Municipality and within the Lejweleputswa District Municipality, Free State Province (refer to **Figure 2.1**).

The project site is located on Portion 0 of the Farm Leeuwbult 580, which are owned by the Mine but outside of the mining area (the project would not impact on mining activities).

The grid connection for the facility will consist of underground cabling within the facility, an on-site facility substation and switching station to be connected to the existing Shafts 1 & 2 HJ Joel Mining Substation via a power line (located ~830m south west of the development footprint). The grid connection infrastructure is located within an assessment corridor of 300m wide and traverses Portion 0 of the Farm Leeuwbult 580.

A technically feasible project site, with an extent of 1000ha has been identified by Freegold Harmony (Pty) Ltd as a technically suitable area for the development of the Project. A development area of ~220ha was demarcated within this project site and allows an adequate footprint for the installation of a solar PV facility with a contracted capacity of up to 18MW, while allowing for the avoidance of environmental site sensitivities. A development footprint of ~47ha has been identified within the project site and assessed for the construction of the facility and its associated infrastructure. The optimal position for the PV facility was determined taking into consideration the environmental sensitivities identified through the Scoping Study. The PV infrastructure has been appropriately placed to optimise the energy generating potential of the solar resource while also minimising impacts on environmental sensitivities.

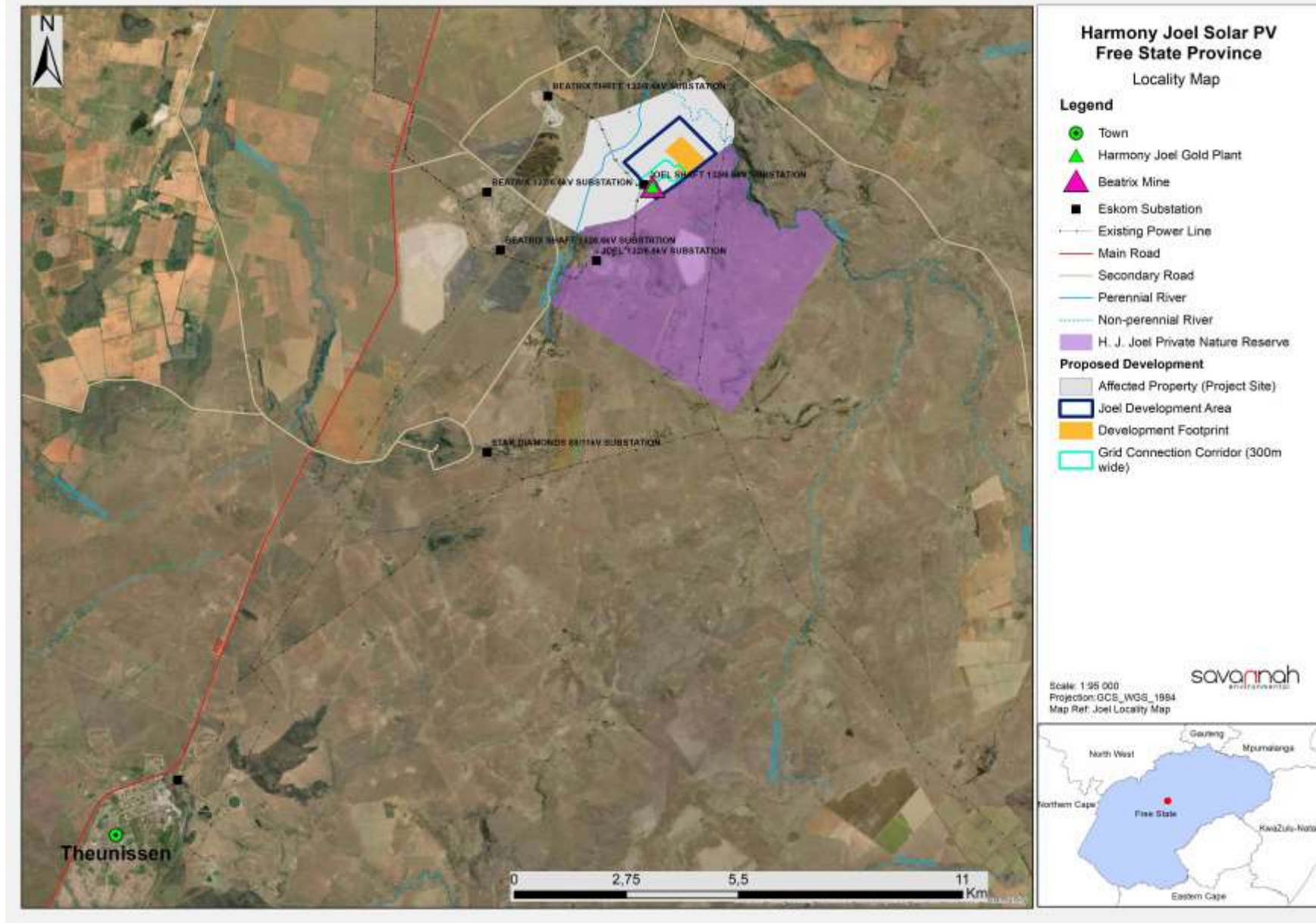


Figure 2.1: Locality map of the project site within which the Harmony Joel Solar PV Facility is proposed to be developed.

2.1. Components of the Harmony Joel Solar PV Facility

The project site is proposed to accommodate both the PV facility as well as most of the associated infrastructure which is required for such a facility and will include:

- » PV modules and mounting structures
- » Inverters and transformers a SCADA room, and maintenance room
- » Cabling between the project components, to be laid underground where practical
- » Access roads, internal roads and fencing around the development area.
- » Temporary and permanent laydown areas and O&M buildings.
- » Grid connection solution including an on-site facility substation, switching station, to be connected to the Shafts 1 & 2 HJ Joel Mining Substation via an overhead power line (located ~830m south west of the development footprint).

A summary of the details and dimensions of the planned infrastructure associated with the project is provided in **Table 2.1**.

Table 2.1: Details the Harmony Joel Solar PV Facility and associated infrastructure

| Component | Description / Dimensions |
|--|--|
| Contracted capacity of the facility | 18MW |
| Total extent of the Affected Properties, also referred to as the project site ² | ~1000ha |
| Total extent of the PV Development Area ³ | ~220ha |
| Total extent of the PV Development Footprint ⁴ | ~47ha |
| Technology | Monofacial or Bifacial PV panels, mounted on either fixed-tilt, or single-axis tracking systems |
| PV panels | Height: ~5.m from ground level (installed). |
| On-Site Facility Substation & Switching Substation Hubs | <ul style="list-style-type: none"> » On-site facility substation located on the Portion 0 of the Farm Leeuwbult 580 » Approximately 2ha in extent. |
| Switching Substation | <ul style="list-style-type: none"> » Switching substation located within Portion 0 of the Farm Leeuwbult 580 » Approximately 2ha in extent |
| Grid Connection | <ul style="list-style-type: none"> » A 300m wide grid connection corridor within which the grid connection infrastructure will be constructed and operated. » Corridor traverses Portion 0 of the Farm Leeuwbult 580 » Cabling connecting PV array to facility substation |
| Site and internal access | <ul style="list-style-type: none"> » The site is accessible via the R30 and an unnamed mine access road. |

² The project site comprises the affected properties for that identified area within which the development area and development footprint are located. It is the broader geographic area assessed as part of the EIA process, within which direct effects of the proposed project may occur. The project site is ~1000ha in extent.

³ The development area is that identified area where the 18MW PV facility is planned to be located. This area has been selected as a practicable option for the facility, considering technical preference and constraints. The development area is ~220ha in extent.

⁴ The development footprint is the defined area (47ha) located within the development area) where the PV panel array and other associated infrastructure for the Harmony Joel Solar PV facility is planned to be constructed. This includes the actual footprint of the facility, and the area which would be disturbed.

| Component | Description / Dimensions |
|----------------------|--|
| | Wherever possible, existing access roads will be utilised to access the project site and development area. Internal roads of up to 6m in width will be required to access the PV panels and the on-site substation. |
| Other infrastructure | <ul style="list-style-type: none"> » Laydown area » O&M and Storage Hub <ul style="list-style-type: none"> » Operations and Management Building » Control centre Warehouse/ workshop |

Table 2.2 provides details regarding the requirements and the activities to be undertaken during the Harmony Joel Solar PV Facility development phases (i.e., construction phase, operation phase and decommissioning phase).

2.2. Activities and Components associated with the Harmony Joel Solar PV Facility

Table 2.4: Details of the Harmony Joel Solar PV Facility development phases (i.e., construction, operation, and decommissioning)

| Construction Phase | |
|---|---|
| Requirements | <ul style="list-style-type: none"> » Project requires an Environmental Authorisation from the DESTEA and a generating authorization issued by NERSA. » Construction expected to be 6 to 12 months in duration. » The construction phase involves installation of the solar PV panels and the structural and electrical infrastructure to make the plant operational. In addition, preparation of the soil and improvement of the access roads would continue for most of the construction phase. » Create direct construction employment opportunities. Approximately 100-120 employment opportunities will be created. » No on-site labour camps. Employees to be accommodated in the nearby towns such as Theunissen and Virginia and transported to and from site on a daily basis. » Overnight on-site worker presence would be limited to security staff. » Waste removal and sanitation will be undertaken by a suitably qualified sub-contractor. Waste containers, including containers for hazardous waste, will be located at easily accessible locations on site when construction activities are undertaken. » Electricity required for construction activities will be provided by the mine. Where low voltage connections are possible, these will be utilised. » Water required for the construction phase will be supplied by the mine or municipality in addition, and where the mine cannot supply water it will be obtained via the Municipality. Should water availability at the time of construction be limited, water will be transported to site via water tanks. Water will be used for sanitation and potable water on site as well as construction works. |
| Activities to be undertaken | |
| Conduct surveys prior to construction | <ul style="list-style-type: none"> » Including, but not limited to a geotechnical survey, site survey and confirmation of the panel micro-siting footprint, and survey of the on-site collector substation site to determine and confirm the locations of all associated infrastructure. |
| Establishment of access roads to the site | <ul style="list-style-type: none"> » Internal access roads within the site will be established at the commencement of construction. » Existing access roads will be utilised, where possible, to minimise impact. It is unlikely that access roads will need to be upgraded as part of the proposed development. » Access roads to be established for construction and/or maintenance activities within the development footprint. » Internal service road alignment will be up to 6m wide. Location is to be determined by the final micro-siting or positioning of the PV panels. |
| Undertake site preparation | <ul style="list-style-type: none"> » Including the clearance of vegetation at the footprint of PV panel supports, establishment of the laydown areas, the establishment of internal access roads and excavations for foundations. » Stripping of topsoil to be stockpiled, for use during rehabilitation. » Vegetation clearance to be undertaken in a systematic manner to reduce the risk of exposed ground being subjected erosion. » Include search and rescue of floral species of concern (where required) and the identification and excavation of any sites of cultural/heritage value (where required). |

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| Establishment of laydown areas and batching plant on site | <ul style="list-style-type: none"> » A laydown area for the storage of PV panels components and civil engineering construction equipment. » The laydown will also accommodate building materials and equipment associated with the construction of buildings. » No borrow pits will be required. Infilling or depositing materials will be sourced from licenced borrow pits within the surrounding areas.. |
| Construct foundation | <ul style="list-style-type: none"> » Excavations to be undertaken mechanically. » For PV array installation vertical support posts will be driven into the ground. » Depending on geological conditions, the use of alternative foundations may be considered (e.g., screw pile, helical pile, micropyle or drilled post/piles). |
| Transport of components and equipment to and within the site | <ul style="list-style-type: none"> » The components for the solar PV facility and onsite substation will be transported to site by road. Transportation will take place via appropriate National and Provincial roads, and the dedicated access/haul road to the site. » Some of the components (i.e., substation transformer) may be defined as abnormal loads in terms of the Road Traffic Act (Act No. 29 of 1989) by virtue of the dimensional limitations. » Typical civil engineering construction equipment will need to be brought to the site (e.g., excavators, trucks, graders, compaction equipment, cement trucks, etc.) as well as components required for the mounting of the PV support structures, construction of the substation and site preparation. » Components for the establishment of the substation (including transformers) and the associated infrastructures to be transported to site. » Transportation will take place via appropriate National and Provincial roads, and the dedicated access/haul road to the site. |
| Erect PV Panels and Construct Substation, Invertors | <ul style="list-style-type: none"> » For array installation, typically vertical support posts are driven into the ground. Depending on the results of the geotechnical study a different foundation method, such as screw pile, helical pile, micro-pile or drilled post/pile could be used. The posts will hold the support structures (tables) on which PV arrays would be mounted. Brackets attach the PV modules to the tables. » Trenches are dug for the underground AC and DC cabling and the foundations of the inverter enclosures and transformers are prepared. » While cables are being laid and combiner boxes are being installed, the PV tables are erected. » Wire harnesses connect the PV modules to the electrical collection systems. Underground cables and overhead circuits connect the Power Conversion Stations (PCS) to the on-site AC electrical infrastructure and ultimately the project's on-site substation. |
| Connection of PV panels to the substation | <ul style="list-style-type: none"> » PV arrays to be connected to the on-site substation via underground electrical cables. » Excavation of trenches is required for the installation of the cables. Trenches will be approximately 1.5m deep. » Underground cables are planned to follow the internal access roads, as far as possible. » Onsite substation to be connected to the collector substation via underground cables. |
| Establishment of ancillary infrastructure | <ul style="list-style-type: none"> » Site offices and maintenance buildings, including workshop areas for maintenance and storage will be required. » Establishment will require the clearing of vegetation, levelling, and the excavation of foundations prior to construction. |
| Connect substation to the power grid | <ul style="list-style-type: none"> » A new 132kV power line will run from the onsite substation and the switching station and tie into the Shafts 1 & 2 HJ Joel Mining Substation |

| | |
|-------------------------------------|--|
| Undertake site rehabilitation | <ul style="list-style-type: none"> » Commence with rehabilitation efforts once construction completed in an area, and all construction equipment is removed. » On commissioning, access points to the site not required during the operation phase will be closed and prepared for rehabilitation. |
| <u>Operation Phase</u> | |
| Requirements | <ul style="list-style-type: none"> » Duration will be up to 25 years. » Requirements for security and maintenance of the project. » Employment opportunities relating mainly to operation activities and maintenance. » Employment opportunities will be available during the operation of the solar facility. |
| Activities to be undertaken | |
| Operation and Maintenance | <ul style="list-style-type: none"> » Full time security, maintenance, and control room staff. » All PV panels will be operational except under circumstances of mechanical breakdown, inclement weather conditions, or maintenance activities. » Solar PV to be subject to periodic maintenance and inspection. » It is anticipated that the PV panels will be washed twice a year during operation using clean water with no cleaning products, or non-hazardous biodegradable cleaning products. » Disposal of waste products (e.g., oil) in accordance with relevant waste management legislation. » Areas which were disturbed during the construction phase to be utilised, should a laydown area be required during operation. |
| <u>Decommissioning Phase</u> | |
| Requirements | <ul style="list-style-type: none"> » Decommissioning of the Harmony Joel Solar PV Facility infrastructure at the end of its economic life. » Potential for repowering of the facility, depending on the condition of the facility at the time. » Expected lifespan of approximately 25 years (with maintenance) before decommissioning is required. » Decommissioning activities to comply with the legislation relevant at the time. » It is expected that the areas of the project site affected by the solar facility infrastructure (development footprint) will revert back to its original land-use (i.e., grazing) once the Harmony Joel facility has reached the end of its economic life and all infrastructure has been decommissioned. |
| Activities to be undertaken | |
| Site preparation | <ul style="list-style-type: none"> » Confirming the integrity of site access to the site to accommodate the required decommissioning equipment. » Preparation of the site (e.g., laydown areas and construction platform). » Mobilisation of construction equipment. |
| Disassemble and remove PV panels | <ul style="list-style-type: none"> » Components to be reused, recycled, or disposed of in accordance with regulatory requirements. » Much of the above ground wire, steel, and PV panels of which the system is comprised are recyclable materials and would be recycled to the extent feasible. » Concrete will be removed to a depth as defined by an agricultural specialist and the area rehabilitated. » Cables will be excavated and removed, as may be required |

2.3. Findings of the EIA Report

The EIA Report, together with the specialist studies provide a detailed assessment of the potential impacts that may result from the development of the Harmony Joel Solar PV Facility. No environmental fatal flaws or unacceptable impacts were identified in the detailed specialist studies conducted, provided that the recommended mitigation measures are implemented. These measures include, amongst others, the avoidance of sensitive features within the development footprint.

No-Go Areas:

- » Two heritage no-go buffers (30m buffer for JL2 and 50m buffer for JL5) were recommended by the heritage specialist. **However, the optimised facility layout was designed to avoid these areas.**

Areas of High Sensitivity:

- » Freshwater areas include delineated wetland areas and riparian zones that are associated with the Doring River. **The development footprint avoids these areas entirely.**
- » Avifaunal sensitivities include the Doring River and buffer zone. **These areas are located around the development footprint which are entirely avoided by the development footprint.**
- » A concentration of artefacts (JL5) was identified and rated as high sensitivity by the specialist. **The optimised facility layout was designed to avoid these areas.**
- » The majority of this area (towards the North and east) is agricultural or vacant land, very few residences reside within this area indicating fewer visual receptors. These features, farms, buildings, recreational facilities and mines can be considered one of the more sensitivity areas in terms of the visual receptors, however there are large number of trees, mining infrastructure and other infrastructure between the proposed development and the receptors which is anticipated to largely reduce the visual impact on the facility.
- » Additionally, there are some roads which are found within this observational area, such as the A169. It is expected that the PV facility would be clearly visible from these sections of road. There are some areas in which the topography is relatively flat with little to no tall vegetation. It is therefore recommended that in these areas the visual impact is mitigated from very high by use of things such as trees etc.
- » The potential negative social impacts associated with the construction phase are typical of construction related projects and not just focused on the construction of PV facilities (these relate to influx of non-local workforce and jobseekers, intrusion and disturbance impacts, safety and security) and could be reduced with the implementation of the mitigation measures proposed.

Areas of Medium Sensitivity:

- » Areas of medium terrestrial ecology sensitivity include natural riparian thicket vegetation. The majority of the site still consists of natural vegetation without previous modification although mining operations situated on and around the site do result in transformation of the surroundings. **These areas are located across the development footprint which are traversed by the optimised layout.**
- » The development footprint is within 500m of delineated wetland features, however, no significant impacts that could pose a risk were identified during the EIA phase assessment.
- » Avifaunal sensitivities include habitat units of open savannoid grassland and bush clump mosaics. These habitat types provide ephemeral foraging habitat for certain threatened bird species (e.g.

Secretarybird), as well as terrestrial bird species (e.g. Northern Black Korhaan) with the potential to interact (e.g. collide) with the proposed electrical infrastructure. However, reporting rates for threatened bird species was relatively low, thereby suggesting a medium sensitivity rating instead of a high sensitivity even though the majority of the habitat units were natural. **These areas are located across the development footprint which are traversed by the optimised layout.**

2.3.1. Cumulative Impacts

Based on the specialist cumulative assessment and findings, the development of the Harmony Joel Solar PV Facility and its contribution to the overall impact of all renewable energy facilities to be developed within a 30km radius, it can be concluded that the Harmony Joel Solar PV Facility cumulative impacts will be of a medium to low significance. It was concluded that the development of the 18MW Harmony Joel Solar PV Facility will not contribute significantly toward the cumulative impacts in this area due to the location within the mining area. The cumulative impact attributed to this facility is therefore acceptable.

2.3.2. Conclusion

Considering the findings of the independent specialist studies, the impacts identified, the development footprint proposed by the developer within the development site, the avoidance of the sensitive environmental features within the project development area, as well as the potential to further minimise the impacts to acceptable levels through mitigation, it is the reasoned opinion of the EAP that the Harmony Joel Solar PV facility and associated grid connection corridor is acceptable within the landscape and can reasonably be authorised. The proposed layout as provided by the Applicant (**Figure 2.2**) is considered to be appropriate from an environmental perspective.

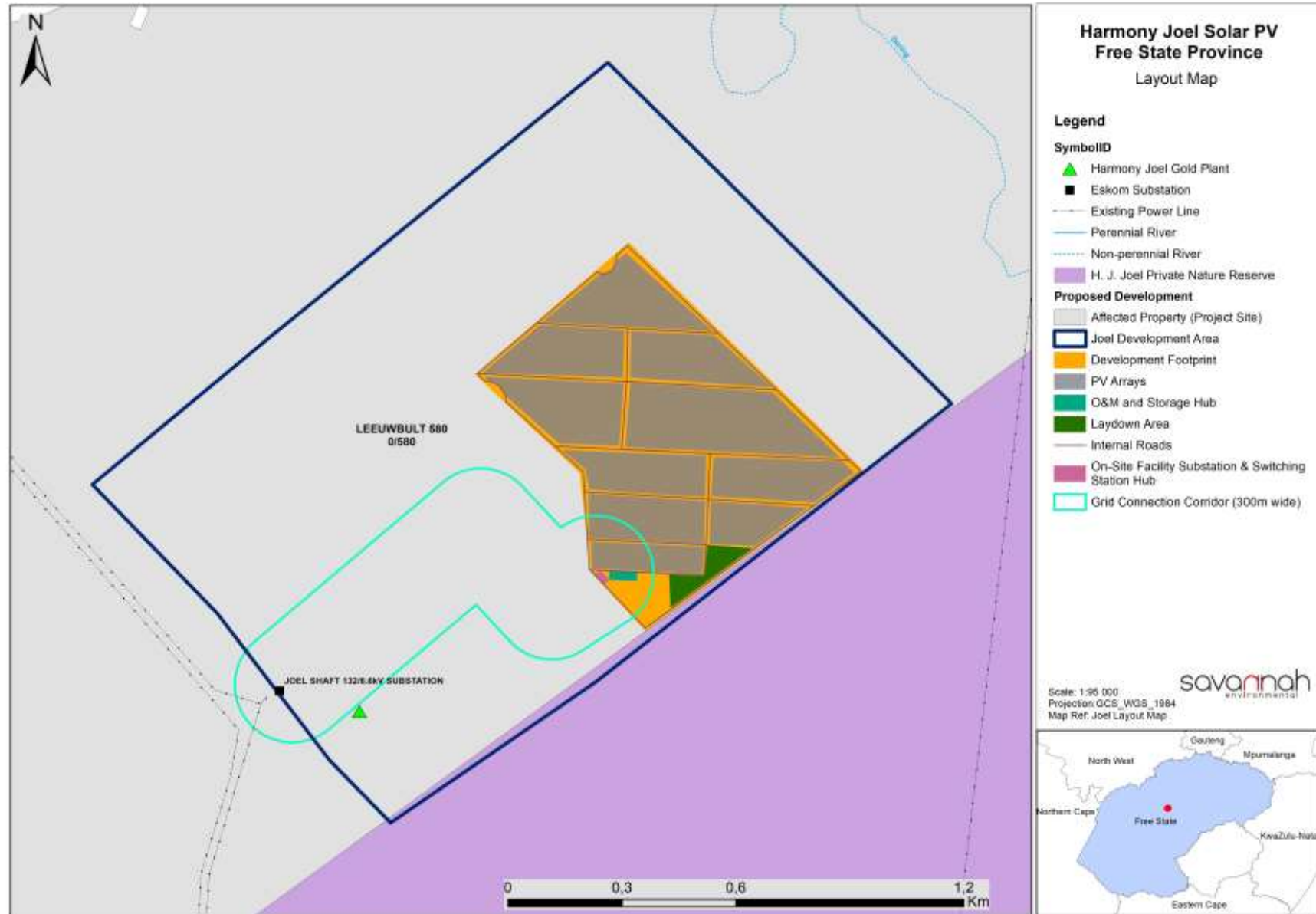


Figure 2.2: The layout of the Harmony Joel Solar PV Facility, as assessed within the EIA Report

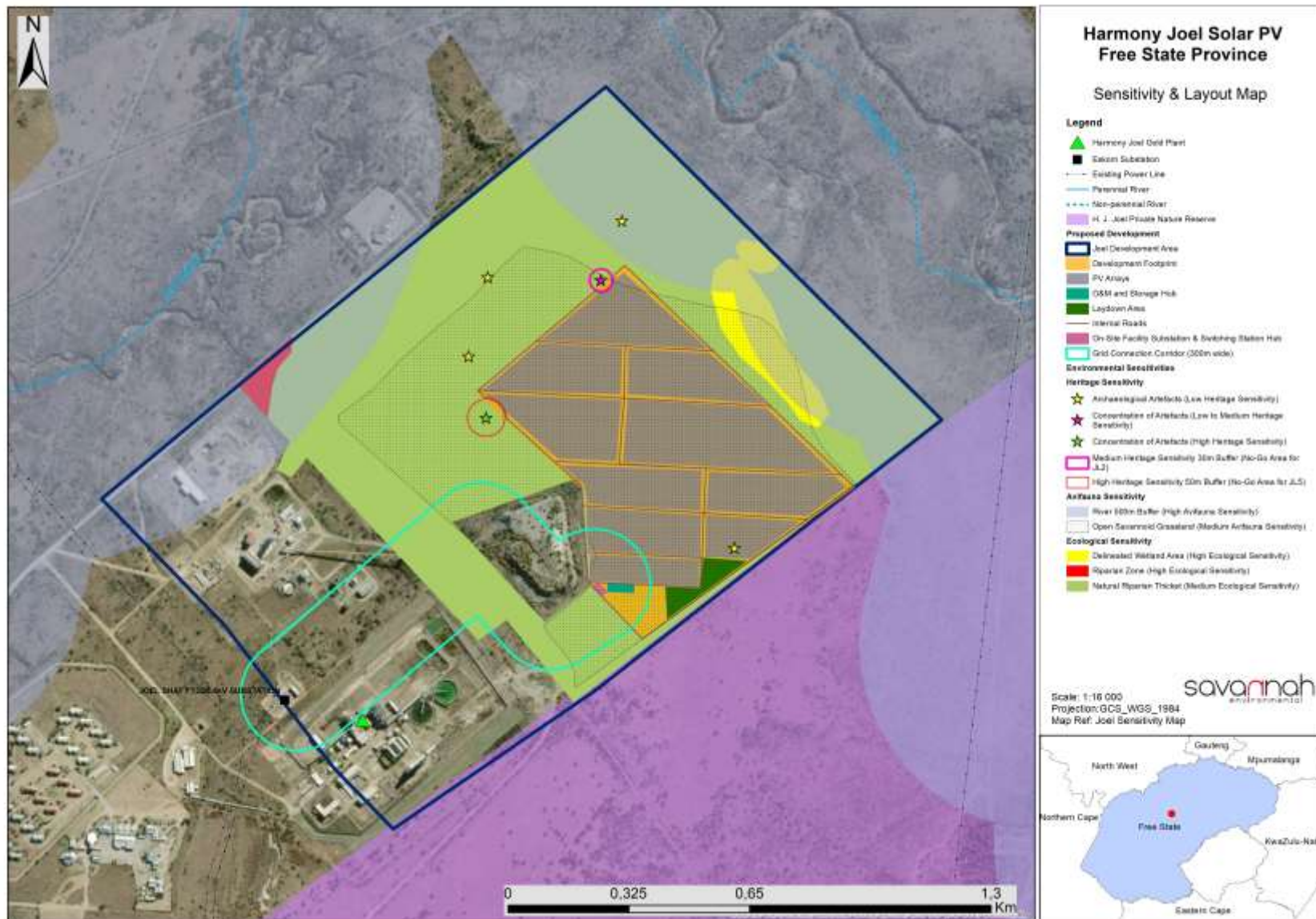


Figure 2.3: The layout of the Harmony Joel Solar PV Facility overlain with environmental sensitivities, as assessed within the EIA Report

CHAPTER 3: PURPOSE AND OBJECTIVES OF THE EMPr

An Environmental Management Programme (EMPr) is defined as “an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented or mitigated, and that the positive benefits of the projects are enhanced”. The objective of this EMPr is to provide consistent information and guidance for implementing the management and monitoring measures established in the permitting process and help achieve environmental policy goals. The purpose of an EMPr is to help ensure continuous improvement of environmental performance, reducing negative impacts and enhancing positive effects during the construction and operation of the facility. An effective EMPr is concerned with both the immediate outcome as well as the long-term impacts of the project.

The EMPr provides specific environmental guidance for the construction and operation phases of a project and is intended to manage and mitigate construction and operation activities so that unnecessary or preventable environmental impacts do not result. These impacts range from those incurred during start up (site clearing and site establishment) through to those incurred during the construction activities themselves (erosion, noise, dust) to those incurred during site rehabilitation (soil stabilisation, re-vegetation) and operation. The EMPr also defines monitoring requirements in order to ensure that the specified objectives are met.

This EMPr is applicable to all employees and contractors working on the pre-construction, construction, and operation and maintenance phases of the Harmony Joel Solar PV Facility. The document must be adhered to and updated as relevant throughout the project life cycle.

This EMPr has been compiled in accordance with Appendix 4 of the EIA Regulations, 2014 (as amended). This is a dynamic document and will be further developed in terms of specific requirements listed in any authorisations issued for the Harmony Joel Solar PV Facility and/or as the project develops. The EMPr has been developed as a set of environmental specifications (i.e. principles of environmental management). The specifications have been developed on the basis of the findings of the Environmental Impact Assessment (EIA) and must be implemented to protect sensitive on-site and off-site features through controlling construction, operation and decommissioning activities that could have a detrimental effect on the environment, and through avoiding or minimising potential impacts.

The EMPr has the following objectives:

- » Outline mitigation measures and environmental specifications which are required to be implemented for the planning, construction, rehabilitation and operation phases of the project in order to minimise the extent of environmental impacts, and to manage environmental impacts associated with the Harmony Joel Solar PV Facility.
- » Ensure that the construction and operation phases do not result in undue or reasonably avoidable adverse environmental impacts and ensure that any potential environmental benefits are enhanced.
- » Identify entities who will be responsible for the implementation of the measures and outline functions and responsibilities.
- » Propose mechanisms and frequency for monitoring compliance and prevent long-term or permanent environmental degradation.

- » Facilitate appropriate and proactive responses to unforeseen events or changes in project implementation that were not considered in the EIA process.

The mitigation measures identified within the EIA process are systematically addressed in the EMPr, ensuring the minimisation of adverse environmental impacts to an acceptable level.

The Applicant must ensure that the implementation of the project complies with the requirements of all environmental authorisations, permits, and obligations emanating from relevant environmental legislation. This obligation is partly met through the development and the implementation of this EMPr, and through its integration into the relevant contract documentation provided to parties responsible for construction and/or operation activities on the site. The adequacy and efficacy of implementation is to be monitored by an independent Environmental Control Officer (ECO). Since this EMPr is part of the EIA process for the Harmony Joel Solar PV Facility, it is important that this document be read in conjunction with the EIA report compiled for this project. This will contextualise the EMPr and enable a thorough understanding of its role and purpose in the integrated environmental management process. Should there be a conflict of interpretation between this EMPr and the Environmental Authorisation, the stipulations in the Environmental Authorisation shall prevail over that of the EMPr, unless otherwise agreed by the authorities in writing. Similarly, any provisions in legislation overrule any provisions or interpretations within this EMPr.

This EMPr shall be binding on all the parties involved in the planning, construction and operational phases of the project, and shall be enforceable at all levels of contract and operational management within the project. The document must be adhered to and updated as relevant throughout the project life cycle.

CHAPTER 4: STRUCTURE OF THIS EMPr

The first three chapters provide background to the EMPr and the Harmony Joel Solar PV Facility, while the chapters which follow consider the following:

- » Planning and design activities;
- » Construction activities;
- » Operation activities; and
- » Decommissioning activities.

These chapters set out the procedures necessary for the Applicant as the project owner, to minimise environmental impacts and achieve environmental compliance. For each of the phases of implementation, an over-arching environmental **goal** is stated. In order to meet this goal, a number of **objectives** are listed. The EMPr has been structured in table format in order to show the links between the goals for each phase and their associated objectives, activities/risk sources, mitigation actions, monitoring requirements and performance indicators. A specific EMPr table has been established for each environmental objective. The information provided within the EMPr table for each objective is illustrated below:

OBJECTIVE: Description of the objective, which is necessary to meet the overall goals; which take into account the findings of the EIA specialist studies

| | |
|-------------------------------------|--|
| Project component/s | List of project components affecting the objective, i.e.: <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | Brief description of potential environmental impact if objective is not met. |
| Activity/risk source | Description of activities which could impact on achieving objective. |
| Mitigation: Target/Objective | Description of the target; include quantitative measures and/or dates of completion. |

| Mitigation: Action/control | Responsibility | Timeframe |
|---|-------------------------------------|---|
| List specific action(s) required to meet the mitigation target/objective described above. | Who is responsible for the measures | Time periods for implementation of measures |

| | |
|------------------------------|---|
| Performance Indicator | Description of key indicator(s) that track progress/indicate the effectiveness of the management plan. |
| Monitoring | Mechanisms for monitoring compliance; the key monitoring actions required to check whether the objectives are being achieved, taking into consideration responsibility, frequency, methods and reporting. |

The objectives and EMPr tables are required to be reviewed and possibly modified throughout the life of the solar facility whenever changes, such as the following, occur:

- » Planned activities change (i.e. in terms of the components of the solar facility).
- » Modification to or addition to environmental objectives and targets.
- » Additional or unforeseen environmental impacts are identified and additional measures are required to be included in the EMPr to prevent deterioration or further deterioration of the environment.
- » Relevant legal or other requirements are changed or introduced.
- » Significant progress has been made in achieving an objective or target such that it should be re-examined to determine if it is still relevant or should be modified, etc.

4.1. Project Team

This EMPr was compiled by:

- » **Chantelle Geyer** is the junior EAP on this project and the GIS Practitioner, she holds a BSc degree in Environmental Science, and a BSc Honours degree in Environmental Geology degree from the North-West University, South Africa. She is an Environmental Consultant and specialises in basic assessments, environmental impact assessments, GIS-mapping, public participation administration, and environmental management programmes.
- » **Karen Jodas** is a Director at Savannah Environmental (Pty) Ltd and the project manager for the Harmony Gold projects. She holds a Master of Science Degree and is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP) and a registered EAP with EAPASA. She has gained extensive knowledge and experience on potential environmental impacts associated with electricity generation and transmission projects through her involvement in related EIA processes over the past 25 years. She has successfully managed and undertaken EIA processes for infrastructure development projects throughout South Africa. Responsibilities for environmental studies include project management (including client and authority liaison and management of specialist teams); review and manipulation of data; identification and assessment of potential negative environmental impacts and benefits; review of specialist studies; and the identification of mitigation measures.
- » **Jo-Anne Thomas** is a registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA - 2019/726) and is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP). She provides technical input for projects in the environmental management field, specialising in Strategic Environmental Advice, Environmental Impact Assessment studies, environmental auditing and monitoring, environmental permitting, public participation, Environmental Management Plans and Programmes, environmental policy, strategy and guideline formulation, and integrated environmental management. Her key focus is on integration of the specialist environmental studies and findings into larger engineering-based projects, strategic assessment, and providing practical and achievable environmental management solutions and mitigation measures.

In order to adequately identify and assess potential environmental impacts associated with the Harmony Joel Solar PV Facility, the following specialist sub-consultants have provided input into this EIA Report:

| Specialist | Area of Expertise |
|--|----------------------------------|
| Darius Van Rensburg of DPR Ecologists & Environmental Services | Ecology and Wetlands |
| Lukas Niemand of Pachnoda Consulting | Avifauna |
| Marinè Pienaar of Terra Africa Environmental Consultants | Soils and Agricultural Potential |

| Specialist | Area of Expertise |
|---|--|
| Jenna Lavin of CTS Heritage | Heritage (including Archaeology Palaeontology and Cultural Heritage) |
| Brogan Geldenhuys of Eco Thunder Consulting | Visual |
| Brogan Geldenhuys of Eco Thunder Consulting | Socio- Economic |

The Savannah Environmental team have extensive knowledge and experience in environmental impact assessment and environmental management, having been involved in EIA processes for more than sixteen (16) years. They have managed and drafted Environmental Management Programmes for other power generation projects throughout South Africa, including numerous wind and solar energy facilities.

CHAPTER 5: ROLES AND RESPONSIBILITIES

OBJECTIVE 1: Establish clear reporting, communication, and responsibilities during construction in relation to the overall implementation of the EMPr

For the purposes of the EMPr, the generic roles that need to be defined are those of the:

- » Project Developer;
- » Project Manager/Site Manager;
- » Environmental Control Officer;
- » Contractors; and
- » Contractor's Safety, Health and Environment Representative/Environmental Officer.

It is acknowledged that the specific titles for these functions may vary once the project is implemented. The purpose of this section of the EMPr is to give a generic outline of what these roles typically entail. It is expected that this will be further defined during project implementation.

i) The Developer

As the Proponent, Freegold Harmony (Pty) Ltd must ensure that the implementation of the project complies with the requirements of all environmental authorisations and all other permits, and obligations emanating from other relevant environmental legislation.

ii) Project Manager/Site Manager

The Project Manager/Site Manager is responsible for overall management of project and EMPr implementation. The following tasks will fall within his/her responsibilities:

- » Be fully conversant with the EIA for the project, the EMPr, the conditions of the Environmental Authorisation (once issued), and all relevant environmental legislation.
- » Be fully knowledgeable with the contents of all relevant licences and permits.
- » Be familiar with the recommendations and mitigation measures of this EMPr and implement these measures.
- » Ensure all specifications and legal constraints specifically with regards to the environment are highlighted to the Contractor(s) so that they are aware of these.
- » Monitor site activities on a daily basis for compliance.
- » Ensure that the EMPr is correctly implemented throughout the project by means of site inspections and meetings. This must be documented as part of the site meeting minutes.
- » Conduct internal audits of the construction site against the EMPr.
- » Confine the construction site to the demarcated area.
- » Rectify transgressions through the implementation of corrective action.

iii) Environmental Control Officer

A suitably qualified Environmental Control Officer (ECO) must be appointed by the holder of the EA prior to the commencement of any authorised activities and will be responsible for monitoring, reviewing and verifying compliance by the Contractor with the environmental specifications of the EMPr and the conditions of the Environmental Authorisation. Accordingly, the ECO will:

- » Be fully knowledgeable of the contents of the EIA Report.
- » Be fully knowledgeable of the contents of the conditions of the EA (once issued).
- » Be fully knowledgeable of the contents of the EMPr.
- » Be fully knowledgeable of all the licences and permits issued to the site.
- » Be fully knowledgeable of the contents of all relevant environmental legislation.
- » Ensure that the contents of the EMPr are communicated to the Contractors site staff and that the Site Manager and Contractors are constantly made aware of the contents through ongoing discussion.
- » Ensure that the compliance of the EMPr, EA and the legislation is monitored through regular and comprehensive inspection of the site and surrounding areas.
- » Ensure that the Site Manager has input into the review and acceptance of construction methods and method statements or site-specific plans.
- » Ensure that if the EMPr, EA and/or the legislation conditions, regulations or specifications are not followed then appropriate measures are undertaken to address any non-compliances (for example an ECO may cease construction or an activity to prevent a non-compliance from continuing).
- » Ensure that any non-compliance or remedial measures that need to be applied are reported.
- » Keep records of all activities on site, problems identified, transgressions noted and a task schedule of tasks undertaken by the ECO.
- » Independently report to the DESTEA in terms of compliance with the specifications of the EMPr and conditions of the EA (once issued).
- » Keep records of all reports submitted to DESTEA.

The ECO must be present on site for the site preparation and initial clearing activities to ensure the correct demarcation of no-go areas, to facilitate environmental induction with construction staff and supervise any flora relocation and faunal rescue activities that may need to take place during the site clearing (i.e. during site establishment, and excavation of foundations). Thereafter, monthly compliance audits can be undertaken, provided that adequate compliance with the EA, environmental permits and EMPr is achieved. The developer should appoint a designated Environmental Officer (EO) to be present on-site to deal with any environmental issues as they arise. The ECO shall remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site handed over for operation.

iv) Contractors

The Lead Contractor is responsible for the following:

- » Ensure compliance with the EA, environmental permits and the EMPr at all times during construction.
- » Have the overall responsibility of the EMPr and its implementation.
- » Ensure that all appointed contractors and sub-contractors are aware of the EMPr and their respective responsibilities.
- » Provide all necessary supervision during the execution of the project.

- » Comply with any special conditions as stipulated by landowners.
- » Inform and educate all employees about the environmental risks associated with the various activities to be undertaken and highlight those activities which should be avoided during the construction process in order to minimise significant impacts to the environment.
- » Maintain an environmental register which keeps a record of all incidents which occur on the site during construction. These incidents include:
 - * Public involvement / complaints
 - * Health and safety incidents
 - * Hazardous materials stored on site
 - * Non-compliance incidents
 - * Ensure that no actions are taken which will harm or may indirectly cause harm to the environment and take steps to prevent pollution on the site.
- » Where construction activities are undertaken is close to any inhabited area, the necessary precautions shall be taken by the Contractor to safeguard the lives and property of the inhabitants.
- » Conduct audits to ensure compliance to the EMPr.
- » Ensure there is communication with the Project Manager, the ECO, and relevant discipline engineers on matters concerning the environment.
- » Should the Contractor require clarity on any aspect of the EMPr the Contractor must contact the Environmental Consultant/Officer for advice.

Contractors and Service Providers must be aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMPr. The contractor is responsible for informing employees and sub-contractors of their environmental obligations in terms of the environmental specifications, and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental impacts. The contractor's obligations in this regard include the following:

- » Employees must have a basic understanding of the key environmental features of the construction site and the surrounding environment.
- » A copy of the EMPr must be easily accessible to all on-site staff members.
- » Employees must be familiar with the requirements of this EMPr and the environmental specifications as they apply to the construction of the solar facility.
- » Prior to commencing any site works, all employees and sub-contractors must have attended an environmental awareness training course which must provide staff with an appreciation of the project's environmental requirements, and how they are to be implemented.
- » Staff will be informed of environmental issues as deemed necessary by the ECO.

All contractors (including sub-contractors and staff) and service providers are ultimately responsible for:

- » Ensuring adherence to the environmental management specifications
- » Ensuring that Method Statements are submitted to the Site Manager (and ECO) for approval before any work is undertaken
- » Any lack of adherence to the above will be considered as non-compliance to the specifications of the EMPr
- » Ensuring that any instructions issued by the Site Manager on the advice of the ECO are adhered to
- » Ensuring that a report is tabled at each site meeting, which will document all incidents that have occurred during the period before the site meeting
- » Ensuring that a register is kept in the site office, which lists all transgressions issued by the ECO

- » Ensuring that a register of all public complaints is maintained
- » Ensuring that all employees, including those of sub-contractors receive training before the commencement of construction in order that they can constructively contribute towards the successful implementation of the EMPr (i.e. ensure their staff are appropriately trained as to the environmental obligations)

v) Contractor's Safety, Health and Environment Representative/Environmental Officer

The Contractor's Safety, Health and Environment (SHE) Representative/Environmental Officer (EO), employed by the Contractor, is responsible for managing the day-to-day on-site implementation of this EMPr, and for the compilation of regular (usually weekly) Monitoring Reports. In addition, the SHE/EO must act as liaison and advisor on all environmental and related issues and ensure that any complaints received from the public are duly recorded and forwarded to the Site Manager and Contractor.

The Contractor's SHE/EO should:

- » Be well versed in environmental matters.
- » Understand the relevant environmental legislation and processes.
- » Understand the hierarchy of Environmental Compliance Reporting, and the implications of Non-Compliance.
- » Know the background of the project and understand the implementation programme.
- » Be able to resolve conflicts and make recommendations on site in terms of the requirements of this Specification.
- » Keep accurate and detailed records of all EMPr-related activities on site.

OBJECTIVE 2: Establish clear reporting, communication, and responsibilities during operation in relation to overall implementation of the EMPr during operation

Formal responsibilities are necessary to ensure that key procedures are executed during operation. Several professionals will form part of the operation team. For the purposes of the EMPr, the generic roles that need to be defined are those of the:

- » Operations Manager; and
- » Environmental Manager

It is acknowledged that the specific titles for these functions may vary once the project is implemented. The purpose of this section of the EMPr is to give a generic outline of what these roles typically entail. It is expected that this will be further defined during project implementation.

i) Operations Manager

The Operations Manager will:

- » Ensure that adequate resources (human, financial, technology) are made available and appropriately managed for the successful implementation of the operational EMPr.
- » Conduct annual basis reviews of the EMPr to evaluate its effectiveness.

- » Take appropriate action as a result of findings and recommendations in management reviews and audits.
- » Provide forums to communicate matters regarding environmental management.

ii) Environmental Manager

The Environmental Manager will:

- » Develop and Implement an Environmental Management System (EMS) for the solar facility and associated infrastructure.
- » Manage and report on the solar facility's environmental performance.
- » Maintain a register of all known environmental impacts and manage the monitoring thereof.
- » Conduct internal environmental audits and co-ordinate external environmental audits.
- » Liaise with statutory bodies (such as the National and Provincial Department of Environmental Affairs and conservation authorities) on environmental performance and other issues.
- » Conduct environmental training and awareness for the employees who operate and maintain the solar facility.
- » Compile environmental policies and procedures.
- » Liaise with interested and affected parties on environmental issues of common concern.
- » Track and control the lodging of any complaints regarding environmental matters.

The Environmental Manager must provide fourteen (14) days written notification to the DESTEA that the Harmony Joel Solar PV Facility operation phase will commence.

CHAPTER 6: MANAGEMENT PROGRAMME: PLANNING AND DESIGN

Overall Goal: undertake the pre-construction (planning and design) phase in a way that:

- » Ensures that the design of the solar facility responds to the identified environmental constraints and opportunities.
- » Ensures that pre-construction activities are undertaken in accordance with all relevant legislative requirements.
- » Ensures that adequate regard has been taken of identified environmental sensitivities, as well as any landowner and community concerns and that these are appropriately addressed through design and planning (where applicable).
- » Enables the construction activities to be undertaken without significant disruption to other land uses and activities in the area.
- » Ensures that the best environmental options are selected for the solar facility.

In order to meet this goal, the following objectives have been identified, together with necessary actions and monitoring requirements.

6.1. Objectives

OBJECTIVE 1: To ensure that the design of the facility responds to the identified environmental constraints and opportunities

If accepted by the DESTEA, proposed development footprint detailed in **Figure 2.2**, must be implemented. Cognisance of sensitive areas defined in **Figure 2.2** and detailed within the EIA Report should be considered when undertaking the final design of the facility.

| | |
|-------------------------------------|---|
| Project component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | <ul style="list-style-type: none"> » Design fails to respond optimally to the identified environmental considerations. » Employment creation for the construction, operation and decommissioning activities. » Design fails to respond optimally to the environmental considerations. |
| Activities/risk sources | <ul style="list-style-type: none"> » Positioning of PV arrays and alignment of access roads and underground cabling where feasible. » Positioning of onsite substation. » Positioning of laydown areas. » Pre-construction activities, e.g. geotechnical investigations. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » To ensure that the design of the solar facility responds to the identified environmental constraints and opportunities, including the constraints identified through the EIA process. » To ensure that pre-construction activities are undertaken in an environmentally friendly manner by e.g. avoiding identified sensitive areas. » Optimal planning of visual infrastructure to minimise visual impact. |

| Mitigation: Action/control | Responsibility | Timeframe |
|--|-----------------------------|------------------|
| Plan and conduct pre-construction activities in an environmentally responsible manner and in a manner that does not lead to unnecessary impacts and disturbance. | Developer EPC Contractor | Pre-construction |
| Consider design level mitigation measures recommended by the specialists, especially with respect to flora, fauna, aquatic ecology, avifauna, bats, and heritage sites, as detailed within the EIA report and relevant appendices. | Developer EPC Contractor | Design phase |
| Following the final design of the Harmony Joel Solar PV Facility, a revised layout must be submitted to DESTEA for review and approval prior to commencing with construction. Micro-siting must take all recommended mitigation measures into consideration. No development is permitted within the identified no-go areas other than that specified within the specialist studies. | Developer EPC Contractor | Design phase |
| Ensure that laydown areas, construction camps and other temporary use areas are located in areas of low and medium sensitivity and are properly fenced or demarcated as appropriate and practically possible. | Developer EPC Contractor | Design phase |
| <p>The following buffer areas are recommended, and should be implemented for maintaining the freshwater resource features REC (Recommended Ecological Category) allowing the persistence of the current present ecological status as well as their functions and services.</p> <ul style="list-style-type: none"> » A 500m regulated buffer has to be implemented around the Doring Rivier and its tributaries. » All freshwater features with their buffer areas have been classified as Highly sensitive and should be regarded as "No-Go" areas apart from the following activities and infrastructure which may be allowed (although restricted to an absolute minimum footprint): <ul style="list-style-type: none"> * only activities relating to the route access and cabling; * the use/upgrade of existing roads and watercourse crossings are the preferred options; * Where no suitable existing roads and watercourse crossings exist, the construction of new access roads and watercourse crossings can be allowed, however this should be deemed as a last resort. * All underground cabling should be laid either within access roads or next to access roads (as close as possible). » The necessary authorisations should be obtained from the Department of Water and Sanitation (DWS) where any construction occurs within 500 meters from the edge of any of the delineated wetlands in the study area. | Developer EPC Contractor | Design phase |
| Existing watercourse crossings should be utilised/ upgraded as far as possible. | Developer EPC Contractor | Design phase |
| Where new watercourse/wetland crossings are required, the engineering team must provide an effective means to minimise | Developer EPC Contractor | Design phase |

| Mitigation: Action/control | Responsibility | Timeframe |
|---|-----------------------------|--------------|
| the potential upstream and downstream effects of sedimentation and erosion (erosion protection) as well minimise the loss of riparian vegetation (reduce footprint as much as possible). All crossings over watercourses/wetlands should be such that the flow within the channels is not impeded and should be constructed perpendicular to the river/wetland channel. | | |
| Road infrastructure and cable alignments should coincide as far as possible to minimise the impact | Developer EPC Contractor | Design phase |
| The underground MV cabling, where crossing watercourses/wetlands, should be laid within the access roads (existing), or if not possible, within the shoulder or at least within 3m of the road shoulder. Ideally the construction disturbance footprint should be kept to an area no wider than 5m. | Developer EPC Contractor | Design phase |
| Under no circumstances must new channels be created for flow diversion and conveyance purposes unless approved as part of an EA or WUL. | Developer EPC Contractor | Design phase |
| All crossings over watercourses/wetlands should be such that the flow within the channels is not impeded and should be constructed perpendicular to the river channel/ and wetland feature. | Developer EPC Contractor | Design phase |
| Infrastructure to avoid avifauna High Sensitivity areas, linear infrastructure (including roads) permitted. | Developer EPC Contractor | Design phase |
| The minimum footprint areas of infrastructure should be used wherever possible, including road widths and lengths. | Developer EPC Contractor | Design phase |
| Internal power lines should be buried wherever possible. | Developer EPC Contractor | Design phase |
| Undertake careful design of security and operational lighting to minimise impacts on surrounding areas. No high mast lighting should be used. | Developer EPC Contractor | Design phase |

| | |
|------------------------------|---|
| Performance Indicator | <ul style="list-style-type: none"> » Design meets the objectives and does not degrade the environment. » Design and layouts respond to the mitigation measures and recommendations in the EIA report. |
| Monitoring | <ul style="list-style-type: none"> » Ensure that the design implemented meets the objectives and mitigation measures in the EIA report through review of the facility design by the Project Manager and ECO prior to the commencement of construction. |

OBJECTIVE 2: Ensure that relevant permits and site-specific plans are in place to manage impacts on the environment

| | |
|----------------------------|--|
| Project Component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
|----------------------------|--|

| | |
|-------------------------------------|--|
| Potential Impact | <ul style="list-style-type: none"> » Impact on identified sensitive areas. » Design fails to respond optimally to the environmental considerations. |
| Activities/Risk Sources | <ul style="list-style-type: none"> » Positioning of all project components » Pre-construction activities, e.g. geotechnical investigations, site surveys of substation footprint, power line servitude and internal access roads and environmental walk-through surveys. » Positioning of temporary sites. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » To ensure that the design of the power plant responds to the identified environmental constraints and opportunities. » To ensure that pre-construction activities are undertaken in an environmentally friendly manner. » To ensure that the design of the power plant responds to the identified constraints identified through pre-construction surveys. |

| Mitigation: Action/Control | Responsibility | Timeframe |
|--|-------------------------|------------------|
| Undertake ecological preconstruction walk-through of the final development footprint to identify and locate protected species that would be affected and that can be translocated. | Developer Specialist | Pre-construction |
| Pre-construction walk-through of the approved development footprint must be undertaken by an avifaunal specialist to ensure that sensitive habitats and species are avoided wherever possible. | Developer Specialist | Pre-construction |
| Obtain any additional environmental permits required. Copies of permits/licenses must be submitted to the Director: Environmental Impact Evaluation at the DESTEA and kept on site during the construction and operation phases of the project. | Developer | Design phase |
| Search and rescue of species of conservation concern should be conducted prior to clearing activities. | Developer Contractor | Pre-construction |
| A stormwater management plan must be developed in the pre-construction phase, detailing the stormwater structures and management interventions that must be installed to manage the increase of surface water flows directly into any natural systems. The stormwater control systems must be inspected on an annual basis to ensure these are functional. Effective stormwater management must include effective stabilisation (gabions and Reno mattresses) of exposed soil and the re-vegetation of any disturbed riverbanks. | Contractor(s) | Design phase |
| Develop an Alien Invasive and Vegetation Rehabilitation Management Plan. | Developer | Pre-construction |
| Develop a detailed method statement for the implementation of the plant rescue and protection plan for the site (refer to Appendix 7). | Developer | Pre-construction |
| Develop a detailed method statement for the implementation of the re-vegetation and habitat rehabilitation plan for the site (refer to Appendix 6). | Developer | Pre-construction |
| Develop a detailed method statement for the implementation of the traffic and transportation management plan for the site (refer to Appendix 8). | Developer | Pre-construction |

| Mitigation: Action/Control | Responsibility | Timeframe |
|--|---------------------------------------|------------------|
| Develop an effective monitoring system to detect any leakage or spillage of all hazardous substances during their transportation, handling, use and storage. This must include precautionary measures to limit the possibility of oil and other toxic liquids from entering the soil or storm water systems. | Developer | Pre-construction |
| A comprehensive rehabilitation / monitoring plan must be developed in consultation with a specialist, and must be implemented from the project onset i.e. during the detailed design phase prior to construction, to ensure a net benefit to the environment within all areas that will remain undisturbed. | Developer Contractor Specialist | Pre-construction |

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| Performance Indicator | <ul style="list-style-type: none"> » Layout does not destroy/degrade no-go areas. » No disturbance of no-go areas. » Permits are obtained and relevant conditions complied with. » Relevant management plans and Method Statements prepared and implemented. |
| Monitoring | <ul style="list-style-type: none"> » Review of the design by the Project Manager and the ECO prior to the commencement of construction. » Monitor ongoing compliance with the EMPr. |

OBJECTIVE 3: Ensure compliance of required mitigation measures and recommendations by contractors

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|-------------------------------------|---|
| Project Component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | <ul style="list-style-type: none"> » Impact on identified sensitive areas. » Planning fails to respond optimally to the environmental considerations. |
| Activities/Risk Sources | <ul style="list-style-type: none"> » Positioning of all project components » Pre-construction activities. » Positioning of temporary sites. » Employment and procurement procedures. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » To ensure that appropriate planning is undertaken by the contractor to ensure compliance with the conditions of the EA and EMPr. » To ensure that pre-construction and construction activities are undertaken in an environmentally friendly manner. |

| Mitigation: Action/Control | Responsibility | Timeframe |
|---|-------------------------|------------------|
| The terms of this EMPr and the Environmental Authorisation must be included in all tender documentation and Contractors contracts. | Developer Contractor | Pre-construction |
| Organise local community meetings to advise the local labour on the project that is planned to be established and the jobs that can potentially be applied for. | Developer Contractor | Pre-construction |
| The developer should encourage the EPC contractor to increase the local procurement practices and promote the employment | Developer Contractor | Pre-construction |

| Mitigation: Action/Control | Responsibility | Timeframe |
|---|-------------------------|------------------|
| of people from local communities, as far as feasible, to maximise the benefits to the local economies. | | |
| The developer should engage with local authorities and business organisations to investigate the possibility of procuring construction materials, goods and products from local suppliers where feasible. | Developer Contractor | Pre-construction |

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| Performance Indicator | » Conditions of the EA and EMPr form part of all contracts. » Local employment and procurement are encouraged. |
| Monitoring | » Monitor ongoing compliance with the EMPr and method statements. |

OBJECTIVE 4: To ensure effective communication mechanisms

It is important to maintain on-going communication with the public (including affected and surrounding landowners) during the construction and operation phases of the Harmony Joel Solar PV Facility. Any issues and concerns raised should be addressed as far as possible in as short a timeframe as possible.

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| Project component/s | » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | » Impacts on affected and surrounding landowners and land uses. |
| Activity/risk source | » Activities associated with pre-construction phase. » Activities associated with construction of the solar facility. » Activities associated with operation. |
| Mitigation: Target/Objective | » Effective communication with affected and surrounding landowners. » Addressing any issues and concerns raised as far as possible in as short a timeframe as possible. |

| Mitigation: Action/control | Responsibility | Timeframe |
|--|---|--|
| Compile and implement a grievance mechanism procedure for the public (including the affected and surrounding landowners) (using Appendix 4) to be implemented during both the construction and operation phases of the solar facility and if applicable during decommissioning. This procedure should include the details of the contact person who will be receiving issues raised by interested and affected parties, and the process that will be followed to address issues. The mechanism must also include procedures to lodge complaints in order for the local community to express any complaints or grievances with the construction process. A Public Complaints register must be maintained by the Contractor to record all complaints and queries relating to the project and the actions taken to resolve the issue. | Developer Contractor O&M Operator | Pre-construction (construction procedure) Pre-operation (operation procedure) |

| Mitigation: Action/control | Responsibility | Timeframe |
|---|---|--|
| A Project Specific Grievance Mechanism must be developed and implemented prior to construction. | | |
| Develop and implement a grievance mechanism for the construction, operation and closure phases of the solar facility for all employees, contractors, subcontractors and site personnel. This procedure should be in line with the South African Labour Law. | Developer Contractor O&M Operator | Pre-construction (construction procedure) Pre-operation (operation procedure) |
| Have a detailed consultation and communication plan with neighbouring property owners to keep them informed with regards to construction progress, issues and potential dangers | Developer | Pre-construction |

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| Performance Indicator | » Effective communication procedures in place for all phases as required. |
| Monitoring | <ul style="list-style-type: none"> » An incident reporting system used to record non-conformances to the EMPr. » Grievance mechanism procedures implemented. » Public complaints register developed and maintained. |

CHAPTER 7: MANAGEMENT PROGRAMME: CONSTRUCTION

Overall Goal: Undertake the construction phase in a way that:

- » Ensures that construction activities are properly managed in respect of environmental aspects and impacts.
- » Enables construction activities to be undertaken without significant disruption to other land uses and activities in the area, in particular concerning noise impacts, farming practices, traffic and road use, and effects on local residents.
- » Minimises the impact on the indigenous natural vegetation, protected tree species, and habitats of ecological value.
- » Minimises impacts on fauna using the site.
- » Minimises the impact on heritage sites should they be uncovered.
- » Ensures rehabilitation of disturbed areas following the execution of the works, such that residual environmental impacts are remediated or curtailed.

An environmental baseline must be established during the undertaking of construction activities, where possible.

7.1. Objectives

In order to meet the overall goal for construction, the following objectives, actions, and monitoring requirements have been identified.

OBJECTIVE 1: Securing the site and site establishment

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|-------------------------------------|---|
| Project component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | <ul style="list-style-type: none"> » Hazards to landowners and public. » Security of materials. » Substantially increased damage to natural vegetation. » Potential impact on fauna and avifauna habitat. |
| Activities/risk sources | <ul style="list-style-type: none"> » Open excavations (foundations and cable trenches). » Movement of construction employees, vehicles and plant equipment in the area and on-site. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » To secure the site against unauthorised entry. » To protect members of the public/landowners/residents. |

| Mitigation: Action/control | Responsibility | Timeframe |
|---|-----------------------|---|
| Secure the site, working areas and excavations in an appropriate manner. Adequate protective measures must be | Contractor EO | During site establishment Maintenance: for duration of Contract |

| Mitigation: Action/control | Responsibility | Timeframe |
|--|----------------|---|
| implemented to prevent unauthorised access to the working area and the internal access/haul routes. | | |
| The Contractor must take all reasonable measures to ensure the safety of the public in the surrounding area. Where the public could be exposed to danger by any of the works or site activities, the Contractor must, as appropriate, provide suitable flagmen, barriers and/or warning signs in English and any other relevant indigenous languages, all to the approval of the Site Manager. All unattended open excavations shall be adequately demarcated and/or fenced. | Contractor | During site establishment Maintenance: for duration of Contract |
| Where necessary to control access, fence and secure the area and implement access control procedures. | Contractor | During site establishment Maintenance: for duration of Contract |
| Establish SABS 089: 1999 Part 1 approved bunded areas for the storage of hazardous materials and hazardous waste. | Contractor | During site establishment and during construction |
| Establish the necessary ablution facilities with chemical toilets and provide adequate sanitation facilities and ablutions for construction workers (1 toilet per every 15 workers) at appropriate locations on site. These must be situated outside of any delineated watercourses and pans/depressions or associated buffers. | Contractor | During site establishment and during construction |
| Water consumption requirements for the site for the construction if not obtained from an authorised water user within the area, must be authorised by the Department of Water and Sanitation. | Developer | Prior to water use |
| Supply adequate weather and vermin proof waste collection bins and skips (covered at minimum with secured netting or shadecloth) at sites where construction is being undertaken. Separate bins should be provided for general and hazardous waste. As far as possible, provision should be made for separation of waste for recycling. | Contractor | Site establishment, and duration of construction |

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|------------------------------|---|
| Performance Indicator | <ul style="list-style-type: none"> » Site is secure and there is no unauthorised entry. » No members of the public/ landowners injured as a result of construction activities. » Fauna and flora are protected as far as practically possible. » Appropriate and adequate waste management and sanitation facilities provided at construction site. |
| Monitoring | <ul style="list-style-type: none"> » Regular visual inspection of the fence for signs of deterioration/forced access. » An incident reporting system must be used to record non-conformances to the EMPr. » Public complaints register must be developed and maintained on site. » ECO/ EO to monitor all construction areas on a continuous basis until all construction is completed; immediate reporting back to the site manager. » ECO/ EO to address any infringements with responsible contractors as soon as these are recorded. |

OBJECTIVE 2: Appropriate management of the construction site and construction workers

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|-------------------------------------|---|
| Project Component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | <ul style="list-style-type: none"> » Damage to indigenous natural vegetation and sensitive areas. » Damage to and/or loss of topsoil (i.e. pollution, compaction etc.). » Impacts on the surrounding environment due to inadequate sanitation and waste removal facilities. » Pollution/contamination of the environment. |
| Activities/Risk Sources | <ul style="list-style-type: none"> » Vegetation clearing and levelling of equipment storage area/s. » Access to and from the equipment storage area/s. » Ablution facilities. » Contractors not aware of the requirements of the EMPr, leading to unnecessary impacts on the surrounding environment. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » Limit equipment storage within demarcated designated areas. » Ensure adequate sanitation facilities and waste management practices. » Ensure appropriate management of actions by on-site personnel in order to minimise impacts to the surrounding environment. |

| Mitigation: Action/Control | Responsibility | Timeframe |
|---|---------------------------------|------------------|
| To minimise impacts on the surrounding environment, contractors must be required to adopt a certain Code of Conduct and commit to restricting construction activities to areas within the development footprint. Contractors and their sub-contractors must be familiar with the conditions of the Environmental Authorisation, the EIA Report, and this EMPr, as well as the requirements of all relevant environmental legislation. | Contractors | Construction |
| Contractors must ensure that all workers are informed at the outset of the construction phase of the conditions contained on the Code of Conduct. | Contractor and sub-contractor/s | Pre-construction |
| Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. | Contractor | Construction |
| All construction vehicles must adhere to clearly defined and demarcated roads. No driving outside of the development boundary must be permitted. | Contractor | Construction |
| Ensure all construction equipment and vehicles are properly maintained at all times. | Contractor | Construction |
| Ensure proper health and safety plans in place during the construction period to ensure safety on and around site during construction | Specialist | Pre-construction |
| Ensure that construction workers are clearly identifiable. All workers must carry identification cards and wear identifiable clothing. | Contractor | Construction |

| Mitigation: Action/Control | Responsibility | Timeframe |
|---|---------------------------------|--------------------------|
| Undertake pre-construction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes awareness to no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within demarcated construction areas etc | Contractor | Construction |
| All personnel should undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as tortoises and snakes which are often persecuted out of fear or superstition, waste management and the importance of not undertaking activities that could result in pollution of those watercourses. | Contractor | Construction |
| Regular toolbox talks should be undertaken to ensure appropriate levels of environmental awareness. | Contractor | Construction |
| Contact details of emergency services must be prominently displayed on site. | Contractor | Construction |
| Contractor must provide adequate firefighting equipment on site and provide firefighting training to selected construction staff. | Contractor | Construction |
| Personnel trained in first aid must be on site to deal with smaller incidents that require medical attention. | Contractor | Construction |
| Road borders must be regularly maintained to ensure that vegetation remains short to serve as an effective firebreak. An emergency fire plan must be developed with emergency procedures in the event of a fire. | Contractor | Duration of construction |
| Strict control of the behaviour of construction workers must be implemented in terms of works near watercourses. | Contractor | Construction |
| Ensure waste storage facilities are maintained and emptied on a regular basis. | Contractor | Duration of construction |
| Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities. | Contractor | Duration of Contract |
| No liquid waste, including grey water, may be discharged into any water body or drainage line. All sewage disposal to take place at a registered and operational wastewater treatment works. Proof of disposal to be retained as proof of responsible disposal. | Contractor | Duration of construction |
| All contaminated water must be contained by means of careful run-off management on site. | Contractor | Construction |
| Ensure compliance with all national, regional and local legislation with regard to the storage, handling and disposal of hydrocarbons, chemicals, solvents and any other harmful and hazardous substances and materials. | Contractor | During construction. |
| Ensure ablution facilities are appropriately maintained. Ablutions must be cleaned regularly and associated waste disposed of at a registered/permitted waste disposal site. Ablutions must be removed from site when construction is completed. | Contractor and sub-contractor/s | Duration of contract |

| Mitigation: Action/Control | Responsibility | Timeframe |
|--|---------------------------------|----------------------|
| Cooking and eating of meals must take place in a designated area. No fires are allowed on site. No firewood or kindling may be gathered from the site or surrounds. | Contractor and sub-contractor/s | Duration of contract |
| All litter must be deposited in a clearly marked, closed, animal-proof disposal bin in the construction area. Particular attention needs to be paid to food waste. | Contractor and sub-contractor/s | Duration of contract |
| Keep a record of all hazardous substances stored on site. Clearly label all the containers storing hazardous waste. | Contractor | Duration of contract |
| A Method Statement must be compiled for the management of pests and vermin within the site, specifically relating to the canteen area if applicable. | Contractor | Construction |
| Ensure proper health and safety plans in place during the construction period to ensure safety on and around site during construction, including fencing of the property and site access restriction. | Contractor and sub-contractor/s | Pre-construction |
| All disturbed areas that are not used such as excess road widths, should be rehabilitated with locally occurring shrubs and grasses after construction to reduce the overall footprint of the development. | Contractor and sub-contractor/s | Construction |
| On completion of the construction phase, all construction workers must leave the site within one week of their contract ending. | Contractor and sub-contractor/s | Construction |
| Employ local contractors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria | Contractor and sub-contractor/s | Construction |

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| Performance Indicator | <ul style="list-style-type: none"> » Code of Conduct drafted before commencement of the construction phase. » Appropriate training of all staff is undertaken prior to them commencing work on the construction site. » Ablution and waste removal facilities are in a good working order and do not pollute the environment due to mismanagement. » All areas are rehabilitated promptly after construction in an area is complete. » Excess vegetation clearing and levelling is not undertaken. » No complaints regarding contractor behaviour or habits. |
| Monitoring | <ul style="list-style-type: none"> » Regular audits of the construction camps and areas of construction on site by the EO. » Proof of disposal of sewage at an appropriate licensed wastewater treatment works. » Proof of disposal of waste at an appropriate licensed waste disposal facility. » An incident reporting system must be used to record non-conformances to the EMPr. » Observation and supervision of Contractor practices throughout the construction phase by the EO. » Complaints will be investigated and, if appropriate, acted upon. |

OBJECTIVE 3: Maximise benefits and opportunities associated with the construction phase

It is acknowledged that skilled personnel are required for the construction of the solar panels and associated infrastructure. However, where semi-skilled and unskilled labour is required, opportunities for local employment should be maximised as far as possible. Employment of locals and the involvement of local

Small, Micro and Medium Enterprises (SMMEs) would enhance the social benefits associated with the solar facility, even if the opportunities are only temporary. The procurement of local goods could furthermore result in positive economic spin-offs.

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| Project component/s | » Construction activities associated with the establishment of the solar facility, including associated infrastructure. |
| Potential Impact | » The opportunities and benefits associated with the creation of local employment and business should be maximised. |
| Activities/risk sources | » The employment of outside contractors to undertake the work and who make use of their own labour will reduce the employment and business opportunities for locals. Employment of local labour will maximise local employment opportunities. |
| Mitigation: Target/Objective | » The Developer, in discussions with the local municipality, should aim to employ as many workers (skilled, semi-skilled / low-skilled) from the local areas/ towns, as possible. » The Developer should also develop a database of local BBBEE service providers. |

| Mitigation: Action/control | Responsibility | Timeframe |
|--|-----------------------|------------------|
| Where feasible, effort must be made to employ locally in order to create maximum benefit for the communities. | Contractor | Construction |
| In order to maximise the positive impact, the project company should provide training courses for employees where feasible to ensure that employees gain as much as possible from the work experience. | Contractor | Construction |
| Where feasible, effort must be made to employ local labour in order to create maximum benefit for the communities and limit in-migration. | Contractor | Construction |
| Train unemployed local community members with insufficient skills and increase absorption of local labour thereby decreasing in-migration. | Contractor | Construction |

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| Performance Indicator | » Maximum amount of semi and unskilled labour locally sourced where possible. » Local suppliers and SMMEs contracted where possible. » Skills transfer facilitated where required. » Apprenticeship programmes established |
| Monitoring and Reporting | » Contractors and appointed ECO must monitor indicators listed above to ensure that they have been met for the construction phase. |

OBJECTIVE 4: Control of noise pollution stemming from construction activities

Various construction activities would be taking place during the development of the facility and may pose a noise risk to the closest receptors. These activities could include temporary or short-term activities where small equipment is used (such as the digging of trenches to lay underground cables). The impact of such activities is generally very low. Impacts may however occur where activities are undertaken at night.

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| Project component/s | » PV arrays; » Substation; » Access roads; and |
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| | » Grid infrastructure. |
| Potential Impact | » Increased noise levels at potentially sensitive receptors. |
| Activity/risk source | » Any construction activities taking place within 500m from potentially noise sensitive developments (NSD). » Site preparation and earthworks. » Construction-related transport. » Foundations or plant equipment installation. » Building activities. |
| Mitigation: Target/Objective | » Ensure that maximum noise levels at potentially sensitive receptors are less than 65dBA. » Prevent the generation of disturbing or nuisance noises. » Ensure acceptable noise levels at surrounding stakeholders and potentially sensitive receptors. » Ensure compliance with the National Noise Control Regulations. » Ensure night-time noise levels less than 45 dBA. |

| Mitigation: Action/control | Responsibility | Timeframe |
|---|-----------------------|--------------------|
| Establish a line of communication and notify all stakeholders of the means of registering any issues, complaints or comments. | Developer | Construction |
| The applicant should minimise active equipment at night, planning the completion of noisiest activities (such as pile driving, rock breaking and excavation) during the daytime period. | Developer | Construction |
| Ensure that all equipment is maintained and fitted with the required noise abatement equipment. | EPC Contractor | Weekly inspection |
| The construction crew must abide by the local by-laws regarding noise. | EPC Contractor | Construction phase |

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| Performance Indicator | » Construction activities do not change the existing ambient sound levels with more than 7dB. » Ensure that maximum noise levels at potentially sensitive receptors are less than 65 dBA. » No noise complaints are registered |
| Monitoring and Reporting | » Monitoring of noise levels associated with construction activities, especially near to sensitive receptors. |

OBJECTIVE 5: Management of dust and emissions and damage to roads

During the construction phase, limited gaseous or particulate emissions (and dust) is anticipated from exhaust emissions from construction vehicles and equipment on-site, as well as vehicle entrained dust from the movement of vehicles on the internal access roads.

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| Project component/s | » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | » Dust impacts can occur from cleared areas and from vehicle movement along gravel roads. |

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| | <ul style="list-style-type: none"> » Release of minor amounts of air pollutants (for example NO₂, CO and SO₂) from vehicles and construction equipment. |
| Activities/risk sources | <ul style="list-style-type: none"> » The movement of construction vehicles and their activities on the site. » Clearing of vegetation and topsoil. » Excavation, grading and scraping. » Transport of materials, equipment and components. » Re-entrainment of deposited dust by vehicle movements. » Wind erosion from topsoil and spoil stockpiles and unsealed roads and surfaces. » Fuel burning from construction vehicles with combustion engines. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » To avoid and or minimise the potential dust impacts associated with heavy vehicles, and also minimise damage to roads. » To ensure emissions from all vehicles are minimised, where possible, for the duration of the construction phase. » To minimise nuisance to the community and adjacent landowners from dust emissions and to comply with workplace health and safety requirements for the duration of the construction phase. |

| Mitigation: Action/control | Responsibility | Timeframe |
|---|---|---|
| Reduce and control construction dust using approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent). | Contractor | Construction phase |
| Vehicles and equipment must be maintained in a road-worthy condition at all times. Road worthy certificates must be in place for all heavy vehicles at the outset of the construction phase and updated on a monthly basis. | Contractor | Construction phase |
| Vehicles used to transport sand and building materials must be fitted with tarpaulins or covers when travelling on roads. | Contractor | Construction phase |
| Ensure vehicles adhere to speed limits on public roads and speed limits set within the site by the Site Manager. | Contractor Transportation contractor | Duration of contract |
| Ensure that damage to gravel public roads and access roads attributable to construction vehicles is repaired before completion of the construction phase. | EPC Contractor | Before completion of construction phase |
| Disturbed areas must be re-vegetated as soon as practicable after construction is complete in an area. | EPC Contractor | At completion of the construction phase |

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| Performance Indicator | <ul style="list-style-type: none"> » Appropriate dust suppression measures implemented on site during the construction phase. » Drivers made aware of the potential safety issues and enforcement of strict speed limits when they are employed or before entering the site. » Road worthy certificates in place for all heavy vehicles at the outset of the construction phase and updated on a monthly basis. |
| Monitoring and Reporting | <ul style="list-style-type: none"> » The Developer and appointed EO must monitor indicators listed above to ensure that they have been met for the construction phase. » Immediate reporting by personnel of any potential or actual issues with nuisance dust or emissions to the Site Manager. » An incident reporting system must be used to record non-conformances to the EMPr. » Public complaints register must be developed and maintained on site. |

OBJECTIVE 6: Conservation of the existing soil resource within the site and in the adjacent areas

The natural soil on the site needs to be preserved as far as possible to minimise impacts on the environment. Soil degradation including erosion (by wind and water) and subsequent deposition elsewhere is of a concern. Uncontrolled run-off relating to construction activities (excessive wetting, etc.) will also lead to accelerated erosion. Degradation of the natural soil profile due to excavation, stockpiling, compaction, pollution and other construction activities will affect soil forming processes and associated ecosystems.

A set of strictly adhered to mitigation measures are required to be implemented in order to effectively limit the impact on the environment. The disturbed areas where human impact is likely are the focus of the mitigation measures laid out below.

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| Project component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | <ul style="list-style-type: none"> » Erosion and soil loss. » Increased runoff. » Downstream sedimentation. |
| Activities/risk sources | <ul style="list-style-type: none"> » Rainfall and wind erosion of disturbed areas. » Excavation, stockpiling and compaction of soil. » Concentrated discharge of water from construction activity. » Stormwater run-off from sealed surfaces. » Mobile construction equipment movement on site. » Roadside drainage ditches. » Project related infrastructure, such as buildings, solar panels and fences. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » To minimise erosion of soil from site during construction. » To minimise damage to vegetation by erosion or deposition. » To retain all topsoil with a stable soil surface |

| Mitigation: Action/control | Responsibility | Timeframe |
|--|-----------------------|------------------|
| Any erosion problems observed along access roads or any hardened/engineered surface should be rectified immediately and monitored thereafter to ensure that they do not re-occur. | Contractor | Construction |
| All bare areas (excluding agricultural land and the development footprint), affected by the development, should be re-vegetated with locally occurring species, to bind the soil and limit erosion potential where applicable. | Contractor | Construction |
| Re-instate as much of the eroded area to its pre-disturbed, "natural" geometry (no change in elevation and any banks not to be steepened) where possible. | Contractor | Construction |
| Roads and other disturbed areas should be regularly monitored for erosion problems and problem areas should receive follow-up monitoring by the EO to assess the success of the remediation. | Contractor EO | Construction |

| Mitigation: Action/control | Responsibility | Timeframe |
|---|----------------|--------------|
| <p>Topsoil must be removed and stored separately from subsoil. Topsoil must be reapplied where appropriate as soon as possible in order to encourage and facilitate rapid regeneration of the natural vegetation on cleared areas.</p> | Contractor | Construction |
| <p>Practical phased development and vegetation clearing must be practiced so that cleared areas are not left un-vegetated and vulnerable to erosion for extended periods of time.</p> | Contractor | Construction |
| <p>Only the proposed access roads as per the development footprint are to be used to reduce any unnecessary compaction.</p> | Contractor | Construction |
| <p>Salvaging topsoil:</p> <ul style="list-style-type: none"> » Topsoil must always be salvaged and stored separately from subsoil and lower-lying parent rock or other spoil material. <ul style="list-style-type: none"> * Topsoil stripping removes up to 30 cm or less of the upper soils. * In cultivated areas, depth of topsoil may increase and needs to be confirmed with the landowner. » Prior to salvaging topsoil the depth, quality and characteristics of topsoil should be known for every management area. <ul style="list-style-type: none"> o This will give an indication of total volumes of topsoil that need to be stored to enable the proper planning and placement of topsoil storage. o Different types of topsoil – rocky soils and sands or loams must be stored separately. » Topsoil should be removed (and stored) under dry conditions to avoid excessive compaction whenever topsoil will have to be stored for longer than one year. | Contractor | Construction |
| <p>Silt traps should be used where there is a danger of topsoil eroding and entering streams and other sensitive areas. These silt traps must be regularly monitored and maintained and replaced / repaired immediately as and when required. These measures should be regularly checked, maintained and repaired when required to ensure that they are effective.</p> | Contractor | Construction |
| <p>Excavated soils should be stockpiled on the upslope side of the excavated trench so that eroded sediments off the stockpile are washed back into the trench.</p> | Contractor | Construction |
| <p>Storing topsoil:</p> <ul style="list-style-type: none"> » Viability of stored topsoil depends on moisture, temperature, oxygen, nutrients and time stored. » Rapid decomposition of organic material in warm, moist topsoil rapidly decreases microbial activity necessary for nutrient cycling, and reduces the amount of beneficial micro-organisms in the soil. » Stockpile location should ideally be in a disturbed but weed-free area. » Storage of all topsoil that is disturbed should be of a maximum height of 2m and the maximum length of time before re-use is 18 months. | Contractor | Construction |

| Mitigation: Action/control | Responsibility | Timeframe |
|---|-------------------|--------------|
| <ul style="list-style-type: none"> » Topsoil handling should be reduced to stripping, piling (once), and re-application. Between the stockpiling and reapplication, stored topsoil should not undergo any further handling except control of erosion and (alien) invasive vegetation. » Where topsoil can be reapplied within six months to one year after excavation, it will be useful to store the topsoil as close as possible to the area of excavation and re-application, e.g. next to cabling trenches. » Do not mix overburden with topsoil stockpiles, as this will dilute the proportion of fertile soil (with less fertile subsoil or rock material). » Employ wind nets made from Hessian or similarly fibrous and biodegradable material, where required, to stabilise newly placed topsoil stockpiles and to reduce wind erosion. » In cases where topsoil has to be stored longer than 6 months or during the rainy season, soils should be kept as dry as possible and protected from erosion and degradation by: <ul style="list-style-type: none"> * Preventing ponding on or between heaps of topsoil * Covering topsoil berms * Preventing all forms of contamination or pollution * Preventing any form of compaction * Monitoring the establishment of all invasive vegetation and removing such if it appears * Keeping slopes of topsoil at a maximal 2:1 ratio * Monitoring and mitigating erosion where it appears » Where topsoil needs to be stored in excess of one year, it is recommended to either cover the topsoil or allow an indigenous grass cover to grow on it – if this does not happen spontaneously, seeding should be considered. | | |
| Spillages of cement to be cleaned up immediately and disposed or re-used in the construction process. | Contractor | Construction |
| Spill kits to be kept on active parts of the construction site and at site offices. | Contractor | Construction |
| Cement batching to take place in designated areas only, as approved on site layout (if applicable). | Contractor | Construction |
| Excavated soils will need to be replaced in the same order as excavated from the trench, i.e. sub-soil must be replaced first and topsoil must be replaced last (this will maximise opportunity for re-vegetation of disturbed areas). | Contractor | Construction |
| Avoid parking of vehicles and equipment outside of designated parking areas. | Contractor ECO | Construction |
| Plan vegetation clearance activities for dry seasons (late autumn, winter and early spring). | Contractor ECO | Construction |
| Re-establish vegetation along the access road to reduce the impact of run-off from the road surface. | Contractor ECO | Construction |
| Maintenance must be undertaken regularly on all vehicles and construction/maintenance machinery to prevent hydrocarbon spills; | Contractor ECO | Construction |

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| Performance Indicator | <ul style="list-style-type: none"> » Minimal level of soil erosion around site. » Minimal level of soil degradation. » No activity outside demarcated areas. » Progressive return of disturbed and rehabilitated areas to the desired end state. » No indications of visible topsoil loss. |
| Monitoring and Reporting | <ul style="list-style-type: none"> » Continual inspections of the site by the EO. » Reporting of ineffective sediment control systems and rectification as soon as possible. » If soil loss is suspected, acceleration of soil conservation and rehabilitation measures must be implemented. |

OBJECTIVE 7: Minimise impacts on sensitive areas and plant species

The site falls within the Central Free State Grassland and Highveld Alluvial vegetation types. Although it is quite heavily affected by transformation for dryland crop cultivation, it is not yet considered as severe enough to be regarded a Threatened Ecosystem. Remaining natural areas of this vegetation type will therefore not have a high conservation value, however, elements of conservation concern may still be present in natural areas.

The site for the proposed solar development is listed as being an Ecological Support Areas 1 & 2 (ESA 1 & 2). A Critical Biodiversity Area 2 (CBA 2) is situated to the west of the site and marginally intersects with the western border of the site. This CBA 2 is associated with surrounding natural grassland of Vaal-Vet Sandy Grassland, an Endangered vegetation type though the marginal portion extending into the study area overlaps with the existing mining plant and is therefore not relevant to the development.

The site is however also situated adjacent to the Doring River and the vegetation structure is much better affiliated with Highveld Alluvial Vegetation which is a riparian vegetation type and dominated by riparian thicket which is quite prominent on the site. The site is fairly uniform and dominated by a mosaic of fairly dense thicket and open grassland and will be discussed as a whole. A small portion in the central portion of the site is clearly transformed and associated with historical tailings dump but has a limited extent of approximately 5 hectares and is the only prominently transformed area of the site (apart from the existing mining plant).

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| Project component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | <ul style="list-style-type: none"> » Loss of plant cover leading to loss of faunal habitat and loss of specimens of protected plants. » Soil erosion. » Indirect impacts on downslope freshwater resource features. » Increased fire hazards. » Increased water use. |
| Activity/risk source | <ul style="list-style-type: none"> » Site preparation and clearing. » Soil disturbance » Introduction of plant propagules with people and vehicles. |

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| | <ul style="list-style-type: none"> » Activities outside of designated construction areas. » Driving off designated routes. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » To limit construction activities to designated areas. » Implement invasive plant clearing prior to construction, but after site demarcation. |

| Mitigation: Action/control | Responsibility | Timeframe |
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| Communicate clearly to all contractors that no disturbance outside the demarcated areas will be tolerated. | Contractor | Construction |
| Demarcate all areas to be cleared with construction tape or other appropriate and effective means. However, caution should be exercised to avoid using material that might entangle fauna. | Contractor | Construction |
| No plants may be translocated or otherwise uprooted or disturbed for rehabilitation or other purpose without express permission from the ECO and or Contractor's EO. | Contractor ECO EO | Construction |
| No fires should be allowed within the site as there is a risk of runaway veld fires. | Contractor | Construction |
| No fuelwood collection should be allowed on-site. | Contractor | Construction |
| Wherever excavation is necessary, topsoil should be set aside and replaced after construction to encourage natural regeneration of the local indigenous species. | Contractor | Construction |
| Regular monitoring for alien plants within the development footprint as well as adjacent areas which receive runoff from the facility must be undertaken as these are also likely to be prone to invasion problems. | Contractor | Construction |
| Regular alien clearing should be conducted using the best-practice methods for the species concerned. The use of herbicides should be avoided as far as possible. | Contractor | Construction |
| Vegetation clearing should occur in a phased manner in accordance with the construction programme to minimise erosion and/or run-off. | Contractor | Construction |
| ECO and/or Contractor's EO to provide supervision and oversight of vegetation clearing activities and other activities which may cause damage to the environment, especially at the initiation of the project, when the majority of vegetation clearing is taking place. | Contractor EO ECO | Construction |
| There should be reduced activity at the site after large rainfall events when the soils are wet. No driving off of hardened roads should occur immediately following large rainfall events until soils have dried out and the risk of bogging down has decreased. | Contractor | Construction |
| Where new roads need to be constructed, the existing road infrastructure should be rationalised and any unnecessary roads decommissioned and rehabilitated to reduce the disturbance of the area within the river beds. | Contractor | Construction |
| The duration of construction work within the watercourses/wetlands must be minimised as far as practically possible through proper planning and phasing. | Contractor | Construction |
| All vehicles to remain on demarcated roads and no unnecessary driving in the veld outside these areas should be allowed. | Contractor | Construction |

| Mitigation: Action/control | Responsibility | Timeframe |
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| Avoid creating conditions in which alien plants may become established: » Keep disturbance of indigenous vegetation to a minimum » Rehabilitate disturbed areas as quickly as possible once construction is complete in an area » Do not import soil from areas with alien plants. | Contractor | Construction |
| Establish an on-going monitoring programme to detect, quantify and remove any alien species that may become established and identify the problem species (as per Conservation of Agricultural Resources Act and Act 43 of 1983 and NEM: Biodiversity Act). | Contractor | Construction |
| Immediately control any alien plants that become established using registered control methods appropriate for the particular species in question. Where necessary, obtain an opinion from a registered Pest Control Officer. | Contractor | Construction |
| All alien plant re-growth must be monitored and should these alien plants reoccur, these plants should be re-eradicated. The scale of the development does however not warrant the use of a Landscape Architect and / or Landscape Contractor. | Contractor | Construction |
| The use of herbicides and pesticides and other related horticultural chemicals should be carefully controlled and only applied by personnel adequately certified to apply pesticides and herbicides (a registered Pest Control Officer). It must be ensured that WHO Recommended Classification of Pesticides by Hazard Class 1a (extremely hazardous) or 1b (highly hazardous) are not purchased, stored or used on site along with any other nationally or internationally similarly restricted/banned products. | Contractor | Construction |
| A registered Pest Control Officer must be appointed to implement the invasive alien plants and weeds management plan. The Pest Control Officer must supervise the clearing team to ensure compliance with the invasive alien plants and weeds management plan. | Contractor | Construction |
| All cleared areas should be revegetated with indigenous perennial species from the local area. | Contractor | Construction |
| In order to mitigate the risk of flooding flood protection structures will have to be erected such as flood berm around the perimeter of the development. | Contractor | Construction |
| Where the protected geophytic species, <i>Boophone distichia</i> and <i>Eucomis autumnalis</i> will be affected by the development, permits will have to be obtained and affected plants transplanted to adjacent areas where they will remain unaffected. A few small specimens of the protected Wild Olive Tree (<i>Olea europaea susp. africana</i>) also occur on the site and permits will also have to be obtained to remove these | Developer ECO | Construction |

Performance Indicator

- » No disturbance outside of designated work areas.
- » Limited alien infestation within project control area.
- » Construction activities restricted to the development footprint.

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| Monitoring and Reporting | <ul style="list-style-type: none"> » Observation of vegetation clearing activities by, the EO throughout the construction phase. » Monitoring of alien plant establishment within the site on an on-going basis. |
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OBJECTIVE 8: Protection of terrestrial fauna

The mammal survey of the site was conducted by means of active searching and recording any tracks or signs of mammals and actual observations of mammals. From the survey the following actual observations of mammals were recorded. The species identified on the site indicate only a moderate species diversity of largely widespread and generalist species and is indicative of a modified natural mammal population. A similar mammal population should also be able to re-establish in the solar development footprint after construction has taken place.

The most significant impact on mammals anticipated on the site itself is primarily concerned with the loss and fragmentation of available habitat. Transformation of the natural vegetation on the site will result in a decrease in the population size as available habitat decreases. As indicated, the site does still consist of natural vegetation though it is still fairly uniform and with moderate habitat diversity and consequently the mammal population is also not anticipated to be diverse. The impact on the loss of habitat would therefore be significant but is unlikely to exceed high values. In addition, extensive natural areas still remain in the surroundings into which mammals on the site can move to without resulting in high habitat pressures.

The assessment has also screened for any other fauna species including those that may require permits in terms of regional legislation for removal, none of significance were observed other than widespread species typical of the habitat and area. A single reptile species (Sungazer or Giant Girdled Lizard) was noted during public consultation as occurring in similar grassland habitat in the region. The site visit confirms that this species is not present and unlikely to occur under status quo conditions due to ongoing cultivation off the site. The site is also not within the expected distribution range of this species and is not flagged by the National Environmental Screening Tool.

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| Project component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | <ul style="list-style-type: none"> » Vegetation clearance and associated impacts on faunal habitats. » Traffic to and from site. |
| Activity/risk source | <ul style="list-style-type: none"> » Site preparation and earthworks. » Foundations or plant equipment installation. » Mobile construction equipment movement on site. » Access road construction activities. » Substation construction facilities. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » To minimise footprints of habitat destruction. » To minimise disturbance to resident and visitor faunal species. |

| Mitigation: Action/control | Responsibility | Timeframe |
|--|-----------------------------|----------------------|
| The extent of clearing and disturbance to the vegetation must be kept to a minimum so that impact on fauna and their habitats is restricted. | Contractor | Construction |
| During construction any fauna directly threatened by the construction activities should be removed to a safe location by a suitably qualified person. | Contractor | Construction |
| The illegal collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off of the construction site. | Contractor | Construction |
| Employees should be trained (e.g. during toolbox talks) that poisonous animals should not be killed and if encountered the ECO/ EO should be informed. | Developer EPC Contractor | Duration of contract |
| If any parts of the site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs) as far as practically possible, which do not attract insects and which should be directed downwards. | Contractor | Construction |
| All construction vehicles on site should adhere to a low speed limit (30km/h) to avoid collisions with susceptible species such as snakes and tortoises. | Contractor | Construction |
| Construction vehicles limited to a minimal footprint on site (no movement outside of the demarcated footprint). | Contractor | Construction |
| Report mortalities (number, locality and species) to Electrical Energy Mortality Register at EWT | Contractor ECO | Duration of contract |

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| Performance Indicator | <ul style="list-style-type: none"> » No disturbance outside of designated work areas. » Minimised clearing of existing/natural vegetation and habitats for fauna. » Limited impacts on faunal species (i.e. noted/recorded fatalities), especially those of conservation concern. |
| Monitoring and Reporting | <ul style="list-style-type: none"> » Observation of vegetation clearing activities by the EO throughout construction phase. » Supervision of all clearing and earthworks by the EO. |

OBJECTIVE 9: Protection of avifauna

From an avifaunal perspective it is evident that bird diversity is positively correlated with vegetation structure, and floristic richness is not often regarded to be a significant contributor of patterns in bird abundance and their spatial distributions. Although grasslands are generally poor in woody plant species, and subsequently support lower bird richness values, it is often considered as an important habitat for many terrestrial bird species such as larks, pipits, korhaans, cisticolas, widowbirds including large terrestrial birds such as Secretarybirds, cranes and storks. Many of these species are also endemic to South Africa and display particularly narrow distribution ranges. Due to the restricted spatial occurrence of the Grassland Biome and severe habitat transformation, many of the bird species that are restricted to the grasslands are also threatened or experiencing declining population sizes.

According to field observations, the total number of species observed on the study area is 91 species. Furthermore, 4 near-endemic species were confirmed on the study area and the immediate surroundings.

However, a large percentage of the species recorded in the study area was represented by waterbirds and shorebird taxa.

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| Project component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | <ul style="list-style-type: none"> » Disturbance of birds (e.g. destruction of habitat). » Displacement of birds. » Collision with project components. » Traffic to and from site. |
| Activity/risk source | <ul style="list-style-type: none"> » Site preparation and earthworks. » Foundations or plant equipment installation. » Mobile construction equipment movement on site. » Access road construction activities. » Substation construction facilities. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » To minimise footprints of habitat destruction. » To minimise disturbance to resident and visitor avifaunal species. |

| Mitigation: Action/control | Responsibility | Timeframe |
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| The extent of clearing and disturbance to the vegetation must be kept to a minimum so that impact on avifauna and their habitats is restricted. | Contractor | Construction |
| Construction camps should be lit with as little light as practically possible, with the lights directed downwards where appropriate | Contractor | Construction |
| The movement of construction personnel should be restricted to the construction areas on the project site. | Contractor | Construction |
| No dogs or cats other than those of the landowners should be allowed on site. | Contractor | Construction |
| The appointed Environmental Officer must be trained to identify the potential Red Data species as well as the signs that indicate possible breeding by these species. | Contractor EO | Construction |
| The Environmental Officer must, during audits/site visits, make a concerted effort to look out for such breeding activities of SCCs, and such efforts may include the training of construction staff (e.g. in Toolbox talks) to identify Red Data species, followed by regular questioning of staff as to the regular whereabouts on site of these species. | Contractor | Construction |
| Any holes dug should not be left open for extended periods of time to prevent entrapment by ground dwelling avifauna or their young and only be dug when required and filled in soon thereafter. | Contractor | Construction |
| Apply bird deterrent devices to the PV panels to discourage birds from colonising the infrastructure or to discourage birds from constructing nests. These could include visual or bio-acoustic deterrents such as highly reflective rotating devices, flashers, anti-perching devices such as bird guards, scaring or chasing activities involving the use of trained dogs or raptors | Contractor | Construction |

| Mitigation: Action/control | Responsibility | Timeframe |
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| and/or netting. Nests should be removed when nest-building attempts are noticed. | | |
| Reduce or minimise the use of outdoor lighting to avoid attracting birds to the lights or to reduce potential disorientation to migrating birds. | Contractor | Construction |
| Use indigenous plant species native to the study area during landscaping and rehabilitation. | ECO | Construction |
| Apply bird deterrent devices to all new powerlines | ECO | Construction |

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| Performance Indicator | <ul style="list-style-type: none"> » No disturbance outside of designated work areas. » Minimised clearing of existing/natural vegetation and habitats for avifauna. » Limited impacts on avifaunal species (i.e. noted/recorded fatalities), especially those of conservation concern. |
| Monitoring and Reporting | <ul style="list-style-type: none"> » Observation of vegetation clearing activities by the EO throughout construction phase. » Supervision of all clearing and earthworks by the EO. |

OBJECTIVE 10: Minimise impacts on heritage sites during the construction of the solar facility.

The areas surveyed as part of this assessment have been transformed through agricultural interventions and/or mining activity. Two sites of scientific cultural value – JL2, graded IIIC and JL5 graded IIIB within the development area proposed for the Harmony Joel Solar PV Facility.

The identified sites of archaeological significance have the potential to provide scientific insight into the past and as such, it is recommended that these areas are not impacted by the proposed development. It is therefore recommended that no-go development buffers as per the recommendations below are implemented.

Furthermore, no impacts to significant palaeontological heritage are anticipated on condition that the attached Chance Fossil Finds Process is implemented and no impacts to the cultural landscape are anticipated.

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| Project component/s | <ul style="list-style-type: none"> » Excavations of solar panel mounting structure foundations. » Excavations of trenches for the installation of cabling and infrastructure. » Excavation of substation foundations. |
| Potential Impact | <ul style="list-style-type: none"> » Loss of archaeological artefacts. » Loss of fossil resources. » Impacts on heritage sites. » Impacts on graves or burial sites. » Loss of resources going unnoticed. » Destruction of resources |
| Activity/risk source | <ul style="list-style-type: none"> » All bulk earthworks. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » To facilitate the likelihood of noticing heritage resources and ensure appropriate actions in terms of the relevant legislation |

| Mitigation: Action/control | Responsibility | Timeframe |
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| » A no-impact buffer of 30m is implemented around Site JL2 and a 50m buffer around site JL5 | Contractor | Construction |
| » The Chance Fossil Finds Procedure must be implemented for the duration of construction activities: <ul style="list-style-type: none"> ○ Training: <ul style="list-style-type: none"> * Workmen and foremen need to be trained in the procedure to follow in instances of accidental discovery of fossil material, in a similar way to the Health and Safety protocol. A brief introduction to the process to follow in the event of possible accidental discovery of fossils should be conducted by the designated Environmental Control Officer (ECO) for the project, or the foreman or site agent in the absence of the ECO. It is recommended that copies of the attached poster and procedure are printed out and displayed at the site office so that workmen may familiarise themselves with them and are thereby prepared in the event that accidental discovery of fossil material takes place. ○ Actions to be undertaken: <ul style="list-style-type: none"> * One person in the staff must be identified and appointed as responsible for the implementation of the protocol in instances of accidental fossil discovery and must report to the ECO or site agent. If the ECO or site agent is not present on site, then the responsible person on site should follow the protocol correctly in order to not jeopardize the conservation and well-being of the fossil material. * Once a workman notices possible fossil material, he/she should report this to the ECO or site agent. Procedure to follow if it is likely that the material identified is a fossil: <ul style="list-style-type: none"> - The ECO or site agent must ensure that all work ceases immediately in the vicinity of the area where the fossil or fossils have been found. - The ECO or site agent must inform SAHRA of the find immediately. This information must include photographs of the findings and GPS co-ordinates. - The ECO or site agent must compile a Preliminary Report and fill in the attached Fossil Discoveries: Preliminary Record Form within 24 hours without removing the fossil from its original position. The Preliminary Report records basic information about the find including: <ul style="list-style-type: none"> ❖ The date. ❖ A description of the discovery. ❖ A description of the fossil and its extent (e.g., position and depth of find). | Contractor | Construction |

| Mitigation: Action/control | Responsibility | Timeframe |
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| <ul style="list-style-type: none"> ❖ Where and how the find has been stored. ❖ Photographs to accompany the preliminary report: (<ul style="list-style-type: none"> ✓ A scale must be used. ✓ Photos of location from several angles. ✓ Photos of vertical section should be provided. ✓ Digital images of hole showing vertical section (side). ✓ Digital images of fossil or fossils. <p>Upon receipt of this Preliminary Report, SAHRA will inform the ECO or site agent whether or not a rescue excavation or rescue collection by a palaeontologist is necessary.</p> <ul style="list-style-type: none"> * Exposed finds must be stabilised where they are unstable and the site capped, e.g. with a plastic sheet or sand bags. This protection should allow for the later excavation of the finds with due scientific care and diligence. SAHRA can advise on the most appropriate method for stabilisation. * If the find cannot be stabilised, the fossil may be collect with extreme care by the ECO or the site agent and put aside and protected until SAHRA advises on further action. Finds collected in this way must be safely and securely stored in tissue paper and an appropriate box. Care must be taken to remove the all fossil material and any breakage of fossil material must be avoided at all costs. * No work may continue in the vicinity of the find until SAHRA has indicated, in writing, that it is appropriate to proceed. | | |

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| Performance Indicator | <ul style="list-style-type: none"> » Reporting of and liaison about possible finds of heritage resources. » Heritage resources noticed and rescued. » All heritage items located are dealt with as per the legislative guidelines. |
| Monitoring and Reporting | <ul style="list-style-type: none"> » Ensure staff are aware of heritage resources and the procedure to follow when found. » EO to conduct inspections of open excavations. |

OBJECTIVE 11: Minimisation of visual impacts associated with construction

During construction heavy vehicles, components, cranes, equipment and construction crews will frequent the area and may cause, at the very least, a visual nuisance to landowners and residents in the area as well as road users.

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| Project component/s | » Construction site. |
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| | » Transportation of staff and equipment. |
| Potential Impact | » Visual impact of general construction activities, and the potential scarring of the landscape due to vegetation clearing and the resulting erosion. » Construction traffic. |
| Activity/risk source | » The viewing of visual scarring by observers in the vicinity of the solar facility or from the roads in the surrounding area. |
| Mitigation: Target/Objective | » Minimal disturbance to vegetation cover in close vicinity of the solar facility and its related infrastructure. » Minimised construction traffic, where possible. » Minimal visual intrusion by construction activities and intact vegetation cover outside of the immediate construction work areas. |

| Mitigation: Action/control | Responsibility | Timeframe |
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| Minimise disturbance of the land beneath the solar panels to ensure that associated infrastructure is sited in such a way that it minimises visual impact | Contractor | Construction |
| Retain and maintain natural vegetation in all areas outside of the development footprint. | Contractor | Construction |
| Should glare prove problematic which is more likely with a tracking system, the trackers need to be programmed to prevent early morning reflection towards the roads. | Contractor | Construction |
| Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. | Contractor | Construction |
| Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts. | Contractor | Construction |
| Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities. | Contractor | Construction |
| Install screens around the construction site to reduce the visual impact of construction on surrounding properties | Contractor | Construction |
| Rehabilitate all disturbed areas, construction areas, servitudes etc. immediately after the completion of construction works. | Contractor | Construction |

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| Performance Indicator | » Construction site maintained in a neat and tidy condition. » Site appropriately rehabilitated after construction is complete. |
| Monitoring | » Monitoring of vegetation clearing during construction by EO. » Monitoring of rehabilitated areas quarterly for at least a year following the end of construction (by contractor as part of construction contract). |

OBJECTIVE 12: Appropriate handling and management of waste

The construction of the solar facility and associated infrastructure will involve the generation of various wastes. In order to manage the wastes effectively, guidelines for the assessment, classification, and management of wastes, along with industry principles for minimising construction wastes must be implemented. The main wastes expected to be generated by the construction activities include:

- » general solid waste
- » hazardous waste
- » inert waste (rock and soil)
- » liquid waste (including grey water and sewage)

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| Project Component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | <ul style="list-style-type: none"> » Inefficient use of resources resulting in excessive waste generation. » Litter or contamination of the site or water through poor waste management practices. |
| Activity/Risk Source | <ul style="list-style-type: none"> » Packaging. » Other construction wastes. » Hydrocarbon use and storage. » Spoil material from excavation, earthworks and site preparation. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » To comply with waste management legislation. » To minimise production of waste. » To ensure appropriate waste storage and disposal. » To avoid environmental harm from waste disposal. |

| Mitigation: Action/Control | Responsibility | Timeframe |
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| Implement an integrated waste management approach that is based on waste minimisation and incorporates reduction, recycling, re-use and disposal where appropriate. Where solid waste is disposed of, such disposal shall only occur at an appropriately licensed landfill. | Contractor | Construction |
| Construction method and materials must be carefully considered in view of waste reduction, re-use, and recycling opportunities. | Contractor | Construction |
| Construction contractors must provide specific detailed waste management plans to deal with all waste streams. | Contractor | Construction |
| Ensure that no litter, refuse, wastes, rubbish, rubble, debris and builders wastes generated on the premises is placed, dumped or deposited on adjacent/surrounding properties. | Contractor | Construction |
| Specific areas must be designated on-site for the temporary management of various waste streams, i.e. general refuse, construction waste (wood and metal scrap), and contaminated waste as required. Location of such areas must seek to minimise the potential for impact on the surrounding environment, including prevention of contaminated runoff, seepage, and vermin control. | Contractor | Construction |
| Where practically possible, construction and general wastes on-site must be reused or recycled. Bins and skips must be available on-site for collection, separation, and storage of waste streams (such as wood, metals, general refuse etc.). | Contractor | Construction |
| Disposal of waste must be in accordance with relevant legislative requirements, including the use of licensed contractors. | Contractor | Construction |
| Uncontaminated waste must be removed at least weekly for disposal, if feasible; other wastes must be removed for recycling/disposal at an appropriate frequency. | Contractor | Construction |

| Mitigation: Action/Control | Responsibility | Timeframe |
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| Hydrocarbon waste must be contained and stored in sealed containers within an appropriately bunded area and clearly labelled. This must be regularly removed and recycled (where possible) or disposed of at an appropriately licensed landfill site. | Contractor | Construction |
| Waste must be stored in accordance with the relevant legislative requirements. | Contractor | Construction |
| Waste must be kept to a minimum and must be transported by approved waste transporters to sites designated for their disposal. | Contractor | Construction |
| No liquid waste, including grey water, may be discharged into any water body or drainage line. All sewage disposal to take place at a registered and operational wastewater treatment works. | Contractor | Construction |
| All liquid wastes must be contained in appropriately sealed vessels/ponds within the footprint of the development and be disposed of at a designated waste management facility. | Contractor | Construction |
| Documentation (waste manifest) must be maintained detailing the quantity, nature, and fate of any regulated waste. Waste disposal records must be available for review at any time. | Contractor | Construction |
| Regularly serviced chemical toilet facilities and/or septic tank must be used to ensure appropriate control of sewage. | Contractor | Construction |
| Daily inspection of all chemical toilets and septic tanks must be performed by environmental representatives on site. | Contractor | Construction |
| In the event where sewage is discharged into the environment, all contaminated vegetation/ rock and soil must be removed immediately and treated as hazardous waste. | Contractor | Construction |
| Under no circumstances may waste be burnt or buried on site. | Contractor | Construction |
| Litter generated by the construction crew must be collected in rubbish bins and disposed of weekly, or at an appropriate frequency, at registered waste disposal sites. | Contractor | Construction |
| Upon the completion of construction, the area must be cleared of potentially polluting materials (including chemical toilets). Spoil stockpiles must also be removed and appropriately disposed of, or the materials re-used for an appropriate purpose. | Contractor | Construction |

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| Performance Indicator | <ul style="list-style-type: none"> » No complaints received regarding waste on site or indiscriminate dumping. » Internal site audits ensuring that waste segregation, recycling and reuse is occurring appropriately. » Provision of all appropriate waste manifests for all waste streams. |
| Monitoring | <ul style="list-style-type: none"> » Observation and supervision of waste management practices throughout construction phase. » Waste collection will be monitored on a regular basis. » Waste documentation completed. » Proof of disposal of sewage at an appropriate wastewater treatment works. » A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon. » An incident reporting system will be used to record non-conformances to the EMPr. |

OBJECTIVE 13: Appropriate handling and storage of chemicals, hazardous substances

The construction phase may involve the storage and handling of a variety of chemicals including adhesives, abrasives, oils and lubricants, paints and solvents.

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| Project Component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | <ul style="list-style-type: none"> » Release of contaminated water from contact with spilled chemicals. » Generation of contaminated wastes from used chemical containers. » Soil pollution. |
| Activity/Risk Source | <ul style="list-style-type: none"> » Vehicles associated with site preparation and earthworks. » Construction activities of area and linear infrastructure. » Hydrocarbon spills by vehicles and machinery during levelling, vegetation clearance and transport of workers, materials and equipment and fuel storage tanks. » Accidental spills of hazardous chemicals. » Polluted water from wash bays and workshops. » Pollution from concrete mixing. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » To ensure that the storage and handling of chemicals and hydrocarbons on-site does not cause pollution to the environment or harm to persons. » To ensure that the storage and maintenance of machinery on-site does not cause pollution of the environment or harm to persons. » Prevent and contain hydrocarbon leaks. » Undertake proper waste management. » Store hazardous chemicals safely in a bunded area. |

| Mitigation: Action/Control | Responsibility | Timeframe |
|--|-----------------------|------------------|
| Implement an emergency preparedness plan during the construction phase. | Contractor | Construction |
| Any liquids stored on site, including fuels and lubricants, must be stored in accordance with applicable legislation. | Contractor | Construction |
| Spill kits must be made available on-site for the clean-up of spills and leaks of contaminants. These must be maintained regularly. | Contractor | Construction |
| Losses of fuel and lubricants from the oil sumps and steering racks of vehicles and equipment must be contained using a drip tray with plastic sheeting filled with absorbent material when not parked on hard standing. | Contractor | Construction |
| Establish an appropriate Hazardous Stores and fuel storage area which is in accordance with the Hazardous Substance Amendment Act, No. 53 of 1992. This must include but not be limited to: <ul style="list-style-type: none"> » Designated area; » All applicable safety signage; » Firefighting equipment; » Enclosed by an impermeable bund as per the requirements of the relevant standards and any relevant by-laws; | Contractor | Construction |

| Mitigation: Action/Control | Responsibility | Timeframe |
|---|----------------|--------------|
| <ul style="list-style-type: none"> » Protected from the elements, » Lockable; » Ventilated; and » Has adequate capacity to contain 110% of the largest container contents. | | |
| The storage of flammable and combustible liquids such as oils must be stored in compliance with Material Safety Data Sheets (MSDS) files. | Contractor | Construction |
| Corrective action must be undertaken immediately if a complaint is made, or potential/actual leak or spill of polluting substance identified. This includes stopping the contaminant from further escaping, cleaning up the affected environment as much as practically possible and implementing preventive measures. Where required, a NEMA Section 30 report must be submitted to DESTEA within 14 days of the incident. | Contractor | Construction |
| In the event of a major spill or leak of contaminants, the relevant administering authority must be immediately notified as per the notification of emergencies/incidents. | Contractor | Construction |
| Spilled concrete must be cleaned up as soon as possible and disposed of at a suitably licensed waste disposal site. | Contractor | Construction |
| Accidental spillage of potentially contaminating liquids and solids must be cleaned up immediately in line with procedures by trained staff with the appropriate equipment. | Contractor | Construction |
| Any contaminated/polluted soil removed from the site must be disposed of at a licensed hazardous waste disposal facility. | Contractor | Construction |
| All machinery and equipment must be inspected regularly for faults and possible leaks, | Contractor | Construction |
| Routine servicing and maintenance of vehicles must not to take place on-site (except for emergencies). If repairs of vehicles must take place, an appropriate drip tray must be used to contain any fuel or oils. | Contractor | Construction |
| Construction machinery must be stored in an appropriately sealed area. | Contractor | Construction |
| Any storage and disposal permits/approvals which may be required must be obtained, and the conditions attached to such permits and approvals will be compiled with. | Contractor | Construction |
| Transport of all hazardous substances must be in accordance with the relevant legislation and regulations. | Contractor | Construction |
| The sediment control and water quality structures used on-site must be monitored and maintained in an operational state at all times. | Contractor | Construction |
| An effective monitoring system must be put in place to detect any leakage or spillage of all hazardous substances during their transportation, handling, installation and storage. | Contractor | Construction |
| Precautions must be in place to limit the possibility of oil and other toxic liquids from entering the soil or clean stormwater system. | Contractor | Construction |

| Mitigation: Action/Control | Responsibility | Timeframe |
|--|----------------|--------------|
| As much material must be pre-fabricated and then transported to site to avoid the risks of contamination associated with mixing, pouring and the storage of chemicals and compounds on site. | Contractor | Construction |
| Have appropriate action plans on site, and training for contactors and employees in the event of spills, leaks and other potential impacts to the aquatic systems. All waste generated on-site during construction must be adequately managed. | Contractor | Construction |
| Minimise fuels and chemicals stored on site. | Contractor | Construction |
| Implement a contingency plan to handle spills, so that environmental damage is avoided. | Contractor | Construction |
| Drip trays must be used during all fuel/chemical dispensing and beneath standing machinery/plant. | Contractor | Construction |
| In the case of petrochemical spillages, the spill must be collected immediately and stored in a designated area until it can be disposed of in accordance with the Hazardous Chemical Substances Regulations, 1995 (Regulation 15). | Contractor | Construction |

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| Performance Indicator | <ul style="list-style-type: none"> » No chemical spills outside of designated storage areas. » No water or soil contamination by spills. » Safe storage of hazardous chemicals. » Proper waste management. |
| Monitoring | <ul style="list-style-type: none"> » Observation and supervision of chemical storage and handling practices and vehicle maintenance throughout construction phase. » A complaints register must be maintained, in which any complaints from the community will be logged. » An incident reporting system must be used to record non-conformances to the EMPr. » On-going visual assessment to detect polluted areas and the application of clean-up and preventative procedures. » Monitor hydrocarbon spills from vehicles and machinery during construction continuously and record volume and nature of spill, location and clean-up actions. » Monitor maintenance of drains and intercept drains weekly. » Analyse soil samples for pollution in areas of known spills or where a breach of containment is evident when it occurs. » Records of accidental spills and clean-up procedures and the results thereof must be audited on an annual basis by the ECO. » Records of all incidents that caused chemical pollution must be kept and a summary of the results must be reported to management annually. |

OBJECTIVE 14: Traffic management and transportation of equipment and materials to site

The construction and decommissioning phases of the project will be the most significant in terms of traffic impacts resulting from the transport of equipment (including solar components) and materials and construction crews to the site and the return of the vehicles after delivery of materials. Potential impacts associated with transportation and access relate mostly to works within the site boundary (i.e. the solar

facility and ancillary infrastructure) and the external road network. This section should be read in conjunction with the Traffic and Transportation Plan attached as **Appendix 8**.

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| Project component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | <ul style="list-style-type: none"> » Traffic congestion, particularly on narrow roads or on road passes where overtaking is not permitted. » Risk of accidents. » Deterioration of road pavement conditions (i.e. both surfaced and gravel road) due to abnormal loads. |
| Activity/risk source | <ul style="list-style-type: none"> » Construction vehicle movement. » Speeding on local roads. » Degradation of local road conditions. » Site preparation and earthworks. » Foundations or plant equipment installation. » Mobile construction equipment movement on-site. » Substation construction activities. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » Minimise impact of traffic associated with the construction of the solar facility on the local traffic volume, existing infrastructure, property owners, animals, and road users. » To minimise the potential for negative interaction between pedestrians or sensitive users and traffic associated with the solar facility construction. » To ensure all vehicles are roadworthy and all materials/equipment are transported appropriately and within any imposed permit/licence conditions. |

| Mitigation: Action/control | Responsibility | Timeframe |
|--|---|------------------|
| Develop and implement a detailed method statement for the implementation of the traffic and transportation management plan (refer to Appendix 8). | Contractor(s), (Transportation sub-contractor) | Construction |
| Heavy vehicles travelling on secondary roads should adhere to low-speed limits to minimise noise and dust pollution. | Contractor(s), (Transportation sub-contractor) | Construction |
| Provide public transportation service for workers in order to reduce congestion on roads. | Contractor | Construction |
| Partner with local municipalities and other prominent users of the local roads to upgrade them to meet the required capacity and intensity of the vehicles related to the planned construction activities. | Contractor | Construction |
| Transportation contractors must adhere to the road rules and regulations. | Contractor | Construction |
| A designated access (or accesses) to the proposed site must be created to ensure safe entry and exit. | Contractor | Construction |
| Utilise only designated access routes & entrance/exits from the site. | Contractor | Construction |
| Implement appropriate signage & road safety measures at entrance/exit to the site and on site. | Contractor | Construction |

| Mitigation: Action/control | Responsibility | Timeframe |
|--|----------------|--------------|
| The delivery of solar components to the site must be staggered and trips must be scheduled to occur outside of peak traffic periods. | Contractor | Construction |
| Reduce the construction period. | Contractor | Construction |
| The use of mobile batching plants and quarries in close proximity to the site must be considered as this would decrease the impact on the surrounding road network. | Contractor | Construction |
| Regular maintenance of gravel roads by the Contractor during the construction and decommissioning phases. | Contractor | Construction |
| If its recommended to avoid staggered intersections on the main access road. Intersections should rather be consolidated or realigned as far as possible. | Contractor | Construction |
| Dust suppression of gravel roads during the construction and decommissioning phases, as required. | Contractor | Construction |
| Staff and general trips should occur outside of peak traffic periods as far as possible. | Contractor | Construction |
| Any low hanging overhead lines (lower than 5.1 m) e.g., Eskom and Telkom lines, along the proposed routes will have to be moved to accommodate the abnormal load vehicles. | Contractor | Construction |
| The internal gravel roads will require grading with a road grader to obtain a flat even surface and the geometric design of these gravel roads needs to be confirmed at detailed design stage. This process is to be undertaken by a civil engineering consultant or a geometric design professional. The road designer should take cognizance that roads need to be designed with smooth, relatively flat gradients to allow an abnormal load vehicle to ascend to the top of a hill. | Contractor | Construction |
| Implement penalties for reckless driving for the drivers of heavy vehicles as a way to enforce compliance to traffic rules. | Contractor | Construction |
| Provide adequate and strategically placed traffic warning signs and control measures along the R38 and secondary roads to warn road users of the construction activities taking place, displaying road safety messages and speed limits for the duration of the construction phase. Traffic warning signs must also be well illuminated at night. | Contractor | Construction |

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| Performance Indicator | <ul style="list-style-type: none"> » No traffic incidents involving project personnel or appointed contractors. » Appropriate signage in place. » No complaints resulting from traffic congestion, delays or driver negligence associated with construction of the solar facility. |
| Monitoring | <ul style="list-style-type: none"> » Visual monitoring of traffic control measures to ensure they are effective. » A complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon. » An incident reporting system will be used to record non-conformances to the EMPr. |

OBJECTIVE 15: Ensure appropriate rehabilitation of disturbed areas such that residual environmental impacts are remediated or curtailed

Areas requiring rehabilitation will include all areas disturbed during the construction phase and that are not required for regular operation and maintenance operations. Rehabilitation should be undertaken in an area as soon as possible after the completion of construction activities within that area.

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| Project component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | <ul style="list-style-type: none"> » Environmental integrity of the site undermined resulting in reduced visual aesthetics, erosion, compromised land capability and the requirement for on-going management intervention. |
| Activity/risk source | <ul style="list-style-type: none"> » Site preparation and earthworks. » Excavation of foundations and trenches. » Temporary laydown areas. » Temporary access roads/tracks. » Other disturbed areas/footprints. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » To ensure and encourage site rehabilitation of disturbed areas. » To ensure that the site is appropriately rehabilitated following the execution of the works, such that residual environmental impacts (including erosion) are remediated or curtailed. |

| Mitigation: Action/control | Responsibility | Timeframe |
|--|--|------------------|
| A site rehabilitation programme should be compiled and implemented (refer to Appendix 6). | EPC Contractor in consultation with Specialist | Construction |
| Following construction, rehabilitation of all areas disturbed (e.g. temporary access tracks and laydown areas) must be undertaken. | Contractor | Rehabilitation |
| Any areas disturbed during the construction phase should be encouraged to rehabilitate as fast and effective as possible and were deemed necessary by the ECO or Contractor's EO, artificial rehabilitation (e.g. re-seeding with collected or commercial indigenous seed mixes) should be applied in order to speed up the rehabilitation process in critical areas (e.g. steep slopes and unstable soils). | Contractor | Rehabilitation |
| Rehabilitation of the working areas must be concurrent with the construction of the project. | Contractor | Construction |
| Closure and rehabilitation of the disturbed areas should commence as soon as the laying of underground cable has been completed. | Contractor | Construction |
| If natural re-vegetation is unsuccessful, seeding and planting of the area will need to be implemented | Contractor | Rehabilitation |
| All temporary facilities, equipment and waste materials must be removed from site and appropriately disposed of. | Contractor | Rehabilitation |

| Mitigation: Action/control | Responsibility | Timeframe |
|--|----------------|----------------|
| Necessary drainage works and anti-erosion measures must be installed, where required, to minimise loss of topsoil and control erosion. | Contractor | Rehabilitation |
| Re-vegetated areas may have to be protected from wind erosion and maintained until an acceptable plant cover has been achieved. | Contractor | Rehabilitation |
| On-going alien plant monitoring and removal should be undertaken on all areas of natural vegetation on an annual basis. | Contractor | Construction |

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| Performance Indicator | <ul style="list-style-type: none"> » All portions of site, including construction camp and working areas, cleared of equipment and temporary facilities. » Topsoil replaced on all areas and stabilised. » Disturbed areas rehabilitated and acceptable plant cover achieved on rehabilitated sites. » Closed site free of erosion and alien invasive plants. |
| Monitoring and Reporting | <ul style="list-style-type: none"> » On-going inspection of rehabilitated areas in order to determine the effectiveness of the rehabilitation measures implemented during the operational lifespan of the solar facility. » On-going alien plant monitoring and removal should be undertaken on an annual basis. » An incident reporting system must be used to record non-conformances to the EMPr. |

7.2. Detailing Method Statements

OBJECTIVE 16: Ensure all construction activities are undertaken with the appropriate level of environmental awareness to minimise environmental risk

The environmental specifications are required to be underpinned by a series of Method Statements, within which the Contractors and Service Providers are required to outline how any identified environmental risks will practically be mitigated and managed for the duration of the contract, and how specifications within this EMPr will be met. That is, the Contractor will be required to describe how specified requirements will be achieved through the submission of written Method Statements to the Site Manager and ECO.

A Method Statement is defined as “a written submission by the Contractor in response to the environmental specification or a request by the Site Manager, setting out the plant, materials, labour and method the Contractor proposes using to conduct an activity, in such detail that the Site Manager is able to assess whether the Contractor’s proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications”. The Method Statement must cover applicable details with regard to:

- » Details of the responsible person/s
- » Construction procedures
- » Materials and equipment to be used
- » Getting the equipment to and from site
- » How the equipment/material will be moved while on-site
- » How and where material will be stored

- » The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur
- » Timing and location of activities
- » Compliance/non-compliance with the Specifications
- » Any other information deemed necessary by the Site Manager

Method Statements must be compiled for all activities which affect any aspect of the environment and should be applied consistently to all activities. Specific areas to be addressed in the method statement: pre, during and post construction include:

- » Site establishment (which explains all activities from induction training to offloading, construction sequence for site establishment and the different amenities and to be established etc., including a site camp plan indicating all of these).
- » Preparation of the site (i.e. clearing vegetation, compacting soils and removing existing infrastructure and waste).
- » Soil management/stockpiling and erosion control.
- » Excavations and backfilling procedure.
- » Stipulate norms and standards for water supply and usage (i.e. comply strictly to licence and legislation requirements and restrictions).
- » Stipulate the stormwater management procedures recommended in the stormwater management method statement.
- » Ablution facilities (placement, maintenance, management and servicing).
- » Solid Waste Management:
 - * Description of the waste storage facilities (on site and accumulative).
 - * Placement of waste stored (on site and accumulative).
 - * Management and collection of the waste process.
 - * Recycle, re-use and removal process and procedure.
- » Liquid waste management:
 - * Design, establish, maintain and operate suitable pollution control facilities necessary to prevent discharge of water containing polluting matter or visible suspended materials into rivers, streams or existing drainage systems.
 - * Should grey water (i.e. water from basins, showers, baths, kitchen sinks etc.) need to be disposed of, link into existing facilities or sewerage systems where possible. Where no facilities are available, grey water runoff must be controlled to ensure there is no unacceptable seepage occurs.
- » Dust and noise pollution:
 - * Describe the necessary measures to ensure that noise from construction activities is maintained within lawfully acceptable levels.
 - * Procedure to control dust at all times on the site, access roads, borrow pits and spoil sites (dust control shall be sufficient so as not to have significant impacts in terms of the biophysical and social environments). These impacts include visual pollution, decreased safety due to reduced visibility, negative effects on human health and the ecology due to dust particle accumulation.
- » Hazardous substance storage (ensure compliance with all national, regional and local legislation with regard to the storage of oils, fuels, lubricants, solvents, wood treatments, bitumen, cement, pesticides and any other harmful and hazardous substances and materials. South African National Standards apply):
 - * Lists of all potentially hazardous substances to be used.
 - * Appropriate handling, storage and disposal procedures.

- * Prevention protocol of accidental contamination of soil at the storage and handling areas.
- * All storage areas, (i.e. for harmful substances appropriately banded with a suitable collection point for accidental spills must be implemented and drip trays underneath dispensing mechanisms including leaking engines/machinery).
- » Fire prevention and management measures on site.
- » Fauna and flora protection process on and off site (i.e. removal to reintroduction or replanting, if necessary):
 - * Rehabilitation, re-vegetation process and bush clearing.
- » Incident and accident reporting protocol.
- » General administration.
- » Designate access road and the protocol for when roads are in use.
- » Requirements on gate control protocols.

The Contractor may not commence with the activity covered by the Method Statement until it has been reviewed by the Site Manager, except in the case of emergency activities and then only with the consent of the Site Manager. Approval of the Method Statement will not absolve the Contractor from their obligations or responsibilities in terms of their contract.

Failure to submit a method statement may result in suspension of the activity concerned until such time as a method statement has been submitted and approved.

7.3. Awareness and Competence: Construction Phase of the Harmony Joel Solar PV Facility

OBJECTIVE 17: To ensure all construction personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm

To achieve effective environmental management, it is important that Contractors are aware of the responsibilities in terms of the relevant environmental legislation and the contents of this EMPr. The Contractor is responsible for informing employees and sub-contractors of their environmental obligations in terms of the environmental specifications, and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental impacts. The Contractors obligations in this regard include the following:

- » All employees must have a basic understanding of the key environmental features of the construction site and the surrounding environment. This includes the discussion/explanation of site environmental matters during toolbox talks.
- » The content and requirements of Method Statements are to be clearly explained to all plant operators and general workers. All staff acting in a supervisory capacity is to have copies of the relevant Method Statements and be aware of the content thereof.
- » Ensuring that a copy of the EMPr is readily available on-site, and that all senior site staff is aware of the location and have access to the document. Senior site staff will be familiar with the requirements of the EMPr and the environmental specifications as they apply to the construction of the solar facility.

- » Ensuring that, prior to commencing any site works, all employees and sub-contractors have attended an Environmental Awareness Training session. The training session must provide the site staff with an appreciation of the project's environmental requirements, and how they are to be implemented.
 - * Records must be kept of those that have completed the relevant training.
 - * Training should be done either in a written or verbal format but must be appropriate for the receiving audience.
 - * Refresher sessions must be held to ensure the contractor staff are aware of their environmental obligations as practically possible.
- » All sub-contractors must have a copy of the EMPr and sign a declaration/ acknowledgement that they are aware and familiar with the contents and requirements of the EMPr and that they will conduct work in such a manner as to ensure compliance with the requirements of the EMPr.
- » Contractors and main sub-contractors should have basic training in the identification of archaeological sites/objects, and protected flora and fauna that may be encountered on the site.
- » Awareness of any other environmental matters, which are deemed to be necessary by the ECO.
- » Ensuring that employee information posters, outlining the environmental "do's" and "don'ts" (as per the environmental awareness training course) are erected at prominent locations throughout the site.

Therefore, prior to the commencement of construction activities on site and before any person commences with work on site thereafter, adequate environmental awareness and responsibility are to be appropriately presented to all staff present on-site, clearly describing their obligations towards environmental controls and methodologies in terms of this EMPr. This training and awareness will be achieved in the following ways:

7.3.1 Environmental Awareness Training

Environmental Awareness Training must be undertaken by the EPC Contractor and must take the form of an on-site talk and demonstration by the EO before the commencement of site establishment and construction on site. The education/awareness programme should be aimed at all levels of management and construction workers within the contractor team. A record of attendance of this training must be maintained by the SHE Officer on site.

7.3.2 Induction Training

Environmental induction training must be presented to all persons who are to work on the site – be it for short or long durations; Contractor's or Engineer's staff; administrative or site staff; sub-contractors or visitors to site.

This induction training should be undertaken by the Contractor's EO and should include discussing the developer's environmental policy and values, the function of the EMPr and Contract Specifications and the importance and reasons for compliance to these. The induction training must highlight the overall "do's" and "don'ts" on site and clarify the repercussions of not complying with these. The non-conformance reporting system must be explained during the induction as well. Opportunity for questions and clarifications must form part of this training. A record of attendance of this training must be maintained by the SHE Officer on site.

7.3.3 Toolbox Talks

Toolbox talks should be held on a scheduled and regular basis (at least once a week) where foremen, environmental and safety representatives of different components of the works and sub-consultants hold

talks relating to environmental practices and safety awareness on site. These talks should also include discussions on possible common incidents occurring on site and the prevention of the reoccurrence thereof. Records of attendance and the awareness talk subject must be kept on file.

7.4. Monitoring Programme: Construction Phase of the Harmony Joel Solar PV Facility

OBJECTIVE 18: To monitor the performance of the control strategies employed against environmental objectives and standards

A monitoring programme must be in place not only to ensure conformance with the EMPr, but also to monitor any environmental issues and impacts which have not been accounted for in the EMPr that are, or could result in significant environmental impacts for which corrective action is required. Monitoring during construction must be on-going for the duration of this phase. The Project Manager must ensure that the monitoring is conducted and reported.

The aim of the monitoring and auditing process will be to monitor the implementation of the specified environmental specifications, in order to:

- » Monitor and audit compliance with the prescriptive and procedural terms of the environmental specifications
- » Ensure adequate and appropriate interventions to address non-compliance
- » Ensure adequate and appropriate interventions to address environmental degradation
- » Provide a mechanism for the lodging and resolution of public complaints
- » Ensure appropriate and adequate record keeping related to environmental compliance
- » Determine the effectiveness of the environmental specifications and recommend the requisite changes and updates based on audit outcomes, in order to enhance the efficacy of environmental management on site
- » Aid in communication and feedback to authorities and stakeholders

All documentation e.g. audit/monitoring/compliance reports and notifications, required to be submitted to the DESTEA in terms of the Environmental Authorisation, must be submitted to the Director: Compliance Monitoring of the Department.

Records relating to monitoring and auditing must be kept on site and made available for inspection to any relevant and competent authority in respect of this development.

7.4.1. Non-Conformance Reports

All supervisory staff including Foremen, Resident Engineers, and the ECO must be provided with the means to be able to submit non-conformance reports to the Site Manager. Non-conformance reports will describe, in detail, the cause, nature and effects of any environmental non-conformance by the Contractor. Records of penalties imposed may be required by the relevant authority within 48 (forty eight) hours.

The non-conformance report will be updated on completion of the corrective measures indicated on the finding sheet. The report must indicate that the remediation measures have been implemented timeously and that the non-conformance can be closed-out to the satisfaction of the Site Manager and ECO.

7.4.2. Incident Reports

According to Section 30 of National Environmental Management Act (NEMA), an "Incident" is defined as an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed.

In terms of the requirements of NEMA, the responsible person must, within 14 days of the incident, report to the Director General, provincial head of department and municipality such information as is available to enable an initial evaluation of the incident, including:

- (a) the nature of the incident;
- (b) the substances involved and an estimation of the quantity released and their possible acute effect on persons and the environment and data needed to assess these effects;
- (c) initial measures taken to minimise impacts;
- (d) causes of the incident, whether direct or indirect, including equipment, technology, system, or management failure; and
- (e) measures taken and to be taken to avoid a recurrence of such incident.

7.4.3. Monitoring Reports

A monitoring report will be compiled by the ECO on a monthly basis (or as dictated by the conditions of the EA) and must be submitted to the Director: Compliance Monitoring at DEA for their records. This report should include details of the activities undertaken in the reporting period, any non-conformances or incidents recorded, corrective action required, and details of those non-conformances or incidents which have been closed out, or any other aspect as per the Appendix 7 of the EIA Regulations (2014, as amended 2017). The EPC contractor must ensure that all waste manifests are provided to the ECO on a monthly basis in order to inform and update the DEA regarding waste related activities.

7.4.4. Audit Report

The Developer must ensure that project compliance with the conditions of the Environmental Authorisation is audited by an independent auditor, and that the audit reports are submitted to the Director: Compliance Monitoring at the DEA at intervals as dictated by the conditions of the EA. Such audits must be undertaken during both the construction and operation phases of the solar facility. The effectiveness of the mitigation measures and recommendations for amongst others the following: grievance incidents; waste management, alien and open space management, re-vegetation and rehabilitation, plant rescue and protection and traffic and transportation should be audited. The results must form part of the project monitoring and audit reports.

7.4.5. Final Audit Report

A final environmental audit report must be compiled by an independent external auditor and be submitted to DESTEA upon completion of the construction and rehabilitation activities (within 30 days of completion of the construction phase). This report must indicate the date of the audit, the name of the auditor and the outcome of the audit in terms of compliance with the environmental authorisation conditions and the requirements of the EMPr.

CHAPTER 8: MANAGEMENT PROGRAMME: OPERATION

Overall Goal: To ensure that the operation of the solar facility does not have unforeseen impacts on the environment and to ensure that all impacts are monitored and the necessary corrective action taken in all cases. In order to address this goal, it is necessary to operate the Harmony Joel Solar PV Facility in a way that:

- » Ensures that operation activities are properly managed in respect of environmental aspects and impacts.
- » Enables the solar facility operation activities to be undertaken without significant disruption to other land uses in the area, in particular with regard to farming practices, traffic and road use, and effects on local residents.
- » Minimises impacts on fauna using the site.

An environmental manager must be appointed during operation whose duty will be to ensure the implementation of the operational EMPr.

8.1. Objectives

In order to meet this goal, the following objectives have been identified, together with necessary actions and monitoring requirements.

OBJECTIVE 1: Securing the site and general maintenance during operation

Safety issues may arise with public access to solar panels (e.g. unauthorised entry to the site) or to the solar facility substation. Prevention and control measures to manage public access are therefore important.

General maintenance at the Harmony Joel Solar PV Facility will be required during the operation of solar facility. The maintenance required may also include the replacement of solar panels, if required during the operation lifetime of the facility.

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|--------------------------------|--|
| Project component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | » Hazards to landowners and public. |
| Activities/risk sources | » Uncontrolled access to the solar facility and associated infrastructure. |
| Mitigation: | » To secure the site against unauthorised entry. |
| Target/Objective | » To protect members of the public/landowners/residents. |

| Mitigation: Action/control | Responsibility | Timeframe |
|--|-----------------------|------------------|
| General onsite maintenance of the solar panels during the operation phase must in no way impact or negatively affect the | O&M Operator | Operation phase |

| Mitigation: Action/control | Responsibility | Timeframe |
|---|----------------|-----------------|
| environment, and contractors or other service providers providing onsite maintenance must be made aware of this EMPr and the content thereof. | | |
| Secure access to the site and entrances. | O&M Operator | Operation phase |
| Post information boards about public safety hazards and emergency contact information. | O&M Operator | Operation phase |
| Should solar panels be required to be replaced, the following will apply: <ul style="list-style-type: none"> » Site access must be confirmed for the transportation of the required solar components and equipment to the site and location of the infrastructure to be replaced. » Materials and solar structures are to be stored within the previously disturbed construction laydown area. No disturbance of areas outside of these areas should occur. » Full clean-up of all materials must be undertaken after the removal and replacement of the solar panels and associated infrastructure is complete, and disturbed areas appropriately rehabilitated. » Most of the materials used for solar panels can be recycled. The majority of the solar panels can be recovered and re-used or recycled. Recyclable materials must be transported off-site by truck and managed at appropriate facilities in accordance with relevant waste management regulations. No waste materials may be left on-site following the replacement. » Waste material which cannot be recycled shall be disposed of at an appropriately licensed waste disposal site or as required by the relevant legislation. | O&M Operator | Operation phase |

| | |
|---------------------------------|--|
| Performance Indicator | <ul style="list-style-type: none"> » Site is secure and there is no unauthorised entry. » No members of the public/ landowners injured. » No complaints from landowners/ public. |
| Monitoring and Reporting | <ul style="list-style-type: none"> » Regular visual inspection of fence for signs of deterioration/forced access. » An incident reporting system must be used to record non-conformances to the EMPr. » A public complaints register must be developed and maintained on site. » Landowners should be consulted regularly. |

OBJECTIVE 2: Protection of indigenous natural vegetation, fauna and maintenance of rehabilitation

Indirect impacts on vegetation and terrestrial fauna during operation could result from maintenance activities and the movement of people and vehicles on site. In order to ensure the long-term environmental integrity of the site following the construction, maintenance of the areas rehabilitated post-construction must be undertaken until these areas have successfully re-established.

| | |
|----------------------------|---|
| Project component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; |
|----------------------------|---|

| | |
|---|--|
| | <ul style="list-style-type: none"> » Access roads; and » Grid infrastructure. |
| Potential Impact | <ul style="list-style-type: none"> » Disturbance to or loss of vegetation and/or habitat. » Alien plant invasion. » Environmental integrity of site undermined resulting in reduced visual aesthetics, erosion, compromised land capability and the requirement for on-going management intervention. |
| Activity/Risk Source | <ul style="list-style-type: none"> » Movement of employee vehicles within and around site. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » Maintain minimised footprints of disturbance of vegetation/ habitats on-site. » Ensure and encourage plant regrowth in non-operational areas of post-construction rehabilitation. |

| Mitigation: Action/Control | Responsibility | Timeframe |
|---|-----------------------|------------------|
| Any potentially dangerous fauna such as snakes or fauna threatened by the maintenance and operational activities should be removed to a safe location. | O&M Operator | Operation phase |
| The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden by anyone except landowners or other individuals with the appropriate permits and permissions where required. | O&M Operator | Operation phase |
| If any parts of the site need to be lit at night for security purposes, this should be done with downward-directed low-UV type lights (such as most LEDs) as far as possible, which do not attract insects. | O&M Operator | Operation phase |
| All vehicles accessing the site should adhere to a low-speed limit (30km/h max) to avoid collisions with susceptible species such as snakes and tortoises. | O&M Operator | Operation phase |
| All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. | O&M Operator | Operation phase |
| Regular monitoring for erosion after construction to ensure that no erosion problems have developed as result of the disturbance must be undertaken, as per the Erosion Management and Rehabilitation Plans for the project. | O&M Operator | Operation phase |
| All erosion problems observed must be rectified as soon as possible, using the appropriate erosion control structures and revegetation techniques. | O&M Operator | Operation phase |
| Due to the disturbance at the site as well as the increased runoff generated by the hard infrastructure, alien plant species are likely to be a long-term problem at the site and a long-term control plan will need to be implemented. Problem plant species are already present in the area and are likely to increase rapidly if not controlled. | O&M Operator | Operation phase |
| Regular monitoring for alien plants within the development footprint as well as adjacent areas which receive runoff from the facility must be undertaken as these are also likely to be prone to invasion problems. | O&M Operator | Operation phase |
| When alien plants are detected, these must be controlled and cleared using the recommended control measures for each | O&M Operator | Operation phase |

| Mitigation: Action/Control | Responsibility | Timeframe |
|---|-------------------------|--|
| species to ensure that the problem is not exacerbated or does not re-occur and increase to problematic levels. Clearing methods must aim to keep disturbance to a minimum. The use of herbicides should be avoided as far as possible. | | |
| No planting or importing any listed invasive alien plant species (all Category 1a, 1b and 2 invasive species) to the site for landscaping, rehabilitation or any other purpose must be undertaken. | O&M Operator | Operation phase |
| Vehicle movements must be restricted to designated roadways. | O&M Operator | Operation phase |
| In order to increase general faunal protection, the use of any pesticide in the solar facility area should be prohibited. | O&M Operator | Operation phase |
| Existing roads must be maintained to ensure limited erosion and impact on areas adjacent to roadways. | O&M Operator | Operation phase |
| Vegetation control within the solar facility should be by manual clearing and herbicides should not be used except to control alien plants in the prescribed manner if necessary. | O&M Operator Specialist | Operation phase |
| All alien plant re-growth must be monitored and should these alien plants reoccur these plants should be re-eradicated. The scale of the development does however not warrant the use of a Landscape Architect and / or Landscape Contractor. | O&M Operator | Operation phase |
| The use of herbicides and other related horticultural chemicals should be carefully controlled and only applied by personnel adequately certified to apply pesticides and herbicides. It must be ensured that WHO Recommended Classification of Pesticides by Hazard Class 1a (extremely hazardous) or 1b (highly hazardous) are not purchased, stored or used on site along with any other nationally or internationally similarly restricted/banned products. | O&M Operator | Operation phase |
| Implement an animal removal plan to ensure safety of workers and fauna. | O&M Operator | Operation phase |
| Fire breaks should be established, where appropriate and as discussed with the landowners. Access roads could also act as fire breaks. | O&M Operator Specialist | Duration of contract |
| There should be follow-up rehabilitation and revegetation of any remaining bare areas with indigenous perennial shrubs and succulents from the local area. | O&M Operator | Operation phase |
| Annual site inspection for erosion with follow up remedial action where problems are identified. | Specialist | Annual monitoring until successful re-establishment of vegetation in an area |
| Noise and disturbance on the site should be kept to a minimum during operation and maintenance activities. | O&M Operator | Operation phase |

| | |
|------------------------------|--|
| Performance Indicator | <ul style="list-style-type: none"> » No further disturbance to vegetation or terrestrial faunal habitats. » No erosion problems resulting from operational activities within the solar facility. » Low abundance of alien plants within affected areas. » Maintenance of a ground cover that resist erosion. » Continued improvement of rehabilitation efforts. |
| Monitoring | <ul style="list-style-type: none"> » Observation of vegetation on-site by environmental manager. |

| | |
|--|--|
| | <ul style="list-style-type: none"> » Regular inspections to monitor plant regrowth/performance of rehabilitation efforts and weed infestation compared to natural/undisturbed areas. » Annual monitoring with records of alien species presence and clearing actions. » Annual monitoring with records of erosion problems and mitigation actions taken with photographs. |
|--|--|

OBJECTIVE 3: Protection of avifauna

| | |
|-------------------------------------|---|
| Project component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | <ul style="list-style-type: none"> » Disturbance to or loss of birds as a result of collision with project components. » Destruction of habitat. » Displacement of birds. » Electrocutation on substation. » Traffic to and from site. |
| Activity/risk source | <ul style="list-style-type: none"> » Maintenance activities. » Substation operation. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » More accurately determine the impact of the operating solar facility on collision-prone Red Data species. » Minimise impacts associated with the solar panels and the substation. |

| Mitigation: Action/control | Responsibility | Timeframe |
|--|-------------------------|------------------|
| If one or more avifaunal SCC carcasses are located and determined likely to have resulted from collisions with infrastructure in any sensitivity area over the lifespan of the facility the fatality is to be appropriately recorded and reported to an avifaunal specialist to determine the most appropriate action. | Developer Specialist | Operation phase |
| Develop and implement a carcass search and bird activity monitoring programme in-line with the latest applicable guidelines. | Developer Specialist | Operation phase |
| Regular reviews of operational phase monitoring data (activity and carcass) and results to be conducted by an avifaunal specialist. These reviews should strive to identify sensitive locations and areas of increased collisions that may require additional mitigation. | Developer Specialist | Operation phase |
| An operational monitoring programme for any novel overhead power lines must be implemented to locate potential collision fatalities. | Developer Specialist | Operation phase |
| Any fatalities located should be reported to Birdlife South Africa (BLSA) and the Endangered Wildlife Trust (EWT). | Developer Specialist | Operation phase |
| Prevent birds from nesting in substation infrastructure through exclusion covers or spikes if required (determined on a case-by-case basis). | Developer Specialist | Operation phase |

| Mitigation: Action/control | Responsibility | Timeframe |
|---|---------------------------|--|
| Apply bird deterrent devices to the PV panels to discourage birds from colonising the infrastructure or to discourage birds from constructing nests. These could include visual or bio-acoustic deterrents such as highly reflective rotating devices, flashers, anti-perching devices such as bird guards, scaring or chasing activities involving the use of trained dogs or raptors and/or netting. Nests should be removed when nest-building attempts are noticed. | ECO Operations Manager | Operation phase |
| Reduce or minimise the use of outdoor lighting to avoid attracting birds to the lights or to reduce potential disorientation to migrating birds. | ECO Operations Manager | Operation phase |
| Implement post-construction monitoring and carcass surveys | Operations Manager | Directly after construction and during operation |

| | |
|---------------------------------|---|
| Performance Indicator | <ul style="list-style-type: none"> » Minimal additional disturbance to bird populations on the solar facility site. » Continued improvement of bird protection devices, as informed by the operational monitoring. » Regular provision of clearly worded, logical and objective information on the interface between the local avifauna and operating solar facility. » Clear and logical recommendations on why, how and when to institute mitigation measures to reduce avian impacts of the development, from the pre-construction to operation phase. |
| Monitoring and Reporting | <ul style="list-style-type: none"> » Observation of avifaunal populations and incidence of injuries/death from collisions from solar and substation infrastructure. » Monitoring of facility and reporting where fatalities do occur. » Review of bird monitoring report on a full year of post-construction monitoring. |

OBJECTIVE 4: Minimisation of visual impact

The mitigation of secondary visual impacts, such as security and functional lighting, construction activities, etc. may be possible and should be implemented and maintained on an on-going basis.

| | |
|-----------------------------|---|
| Project component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | <ul style="list-style-type: none"> » Enhanced visual intrusion. » Visual impact of the solar facility degradation (including operational solar panels) and vegetation rehabilitation failure. |
| Activity/risk source | <ul style="list-style-type: none"> » Associated lighting. » Solar panels and other infrastructure. » Access roads. » Other associated infrastructure. » Viewing of the degradation and vegetation rehabilitation failure by observers on or near the site. |

| | |
|-------------------------|--|
| Mitigation: | » To minimise the potential for visual impact. |
| Target/Objective | » Well maintained and neat facility. |

| Mitigation: Action/control | Responsibility | Timeframe |
|---|-----------------------|---------------------------|
| Maintain the general appearance of the facility as a whole, including the solar panels and associated infrastructure. | O&M Operator | Operation and maintenance |
| Should glare prove problematic which is more likely with a tracking system, the trackers need to be programmed to prevent early morning reflection towards the roads. | O&M Operator | Operation phase |
| Use low key lighting around buildings and operational areas that is triggered only when people are present. | O&M Operator | Operation phase |
| Plan to utilise infra-red security systems or motion sensor triggered security lighting. | O&M Operator | Operation phase |
| Ensure that lighting is focused on the development with no light spillage outside the site. | O&M Operator | Operation phase |
| If specific sensitive visual receptors are identified during operation, investigate screening at the receptor site. | O&M Operator | Operation phase |
| Investigate the potential to screen the PV facility from the unnamed roads (located within 1km of the facility) with planted vegetation cover or solid fencing, where possible/if required. | O&M Operator | Operation phase |
| Maintain the general appearance of the facility as a whole, including the PV panels, servitudes, and the ancillary structures. | O&M Operator | Operation phase |

| | |
|---------------------------------|--|
| Performance Indicator | » Well maintained and neat facility with intact vegetation on and in the vicinity of the solar facility. |
| Monitoring and Reporting | » Monitoring of the entire site on an ongoing basis by the operator. |

OBJECTIVE 5: Appropriate management of stormwater and erosion control

| | |
|--------------------------------|--|
| Project component/s | » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | » Erosion and soil loss. » Increased runoff. » Downstream sedimentation. |
| Activities/risk sources | » Rainfall and wind erosion of disturbed areas. » Concentrated discharge of water from project site. » Stormwater run-off from sealed surfaces. » Roadside drainage ditches. » Project related infrastructure, such as buildings, solar panels and fences. |

| | |
|---|---|
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » To minimise erosion of soil from site during operation. » To minimise damage to vegetation by erosion or deposition. » To retain all topsoil with a stable soil surface |
|---|---|

| Mitigation: Action/control | Responsibility | Timeframe |
|--|----------------|-----------------|
| Any erosion problems observed along access roads or any hardened/engineered surface should be rectified immediately and monitored thereafter to ensure that they do not re-occur | O&M Operator | Operation phase |
| All bare areas (excluding agricultural land and the development footprint), affected by the development, should be re-vegetated with locally occurring species, to bind the soil and limit erosion potential where applicable. | O&M Operator | Operation phase |
| Re-instate as much of the eroded area to its pre-disturbed, "natural" geometry (no change in elevation and any banks not to be steepened) where possible. | O&M Operator | Operation phase |
| Roads and other disturbed areas should be regularly monitored for erosion problems and problem areas should receive follow-up monitoring by the EO to assess the success of the remediation. | O&M Operator | Operation phase |
| Any stormwater within the site must be handled in a suitable manner as per the management measures in stormwater management plan. | O&M Operator | Operation phase |
| Stormwater from hardstand areas, buildings and the substation must be managed using appropriate channels and swales when located within steep areas. | O&M Operator | Operation phase |
| No stormwater runoff must be allowed to discharge directly into the watercourses. The runoff should rather be dissipated over a broad area covered by natural vegetation or managed using appropriate channels and swales when located within steep embankments. | O&M Operator | Operation phase |
| Stormwater run-off infrastructure must be maintained to mitigate both the flow and water quality impacts of any stormwater leaving the solar energy facility site. | O&M Operator | Operation phase |

| | |
|---------------------------------|---|
| Performance Indicator | <ul style="list-style-type: none"> » Minimal level of soil erosion around site. » Minimal level of soil degradation. » No activity outside demarcated areas. » Progressive return of disturbed and rehabilitated areas to the desired end state. » No indications of visible topsoil loss. |
| Monitoring and Reporting | <ul style="list-style-type: none"> » Continual inspections of the site by the Environmental Manager/EO. » Reporting of ineffective sediment control systems and rectification as soon as possible. » If soil loss is suspected, acceleration of soil conservation and rehabilitation measures must be implemented. |

OBJECTIVE 6: Appropriate handling and management of hazardous substances and waste

The operation of the solar facility will involve the generation of limited waste products. The main wastes expected to be generated by the operation activities includes general solid waste and hazardous waste.

| | |
|---|---|
| Project component/s | <ul style="list-style-type: none"> » PV arrays; » Substation; » Access roads; and » Grid infrastructure. |
| Potential Impact | <ul style="list-style-type: none"> » Inefficient use of resources resulting in excessive waste generation. » Litter or contamination of the site or water through poor waste management practices. |
| Activity/risk source | <ul style="list-style-type: none"> » Transformers and switchgear – substation. » Fuel and oil storage. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » To comply with waste management legislation. » To minimise production of waste. » To ensure appropriate waste disposal. » To avoid environmental harm from waste disposal. |

| Mitigation: Action/control | Responsibility | Timeframe |
|---|--|---------------------------|
| Hazardous substances must be stored in sealed containers within a clearly demarcated designated area. | O&M Operator | Operation phase |
| Storage areas for hazardous substances must be conducted within a secured and clearly demarcated area. | O&M Operator | Operation phase |
| All structures and/or components replaced during maintenance activities must be appropriately disposed of at an appropriately licensed waste disposal site or sold to a recycling merchant for recycling. | O&M Operator | Operation phase |
| Care must be taken to ensure that spillage of oils and other hazardous substances are limited during maintenance. Handling of these materials should take place within an appropriately sealed and bunded area. Should any accidental spillage take place, it must be cleaned up according to specified standards regarding bioremediation. | O&M Operator | Operation and maintenance |
| Waste handling, collection and disposal operations must be managed and controlled by a waste management contractor. | O&M Operator / waste management contractor | Operation phase |
| Used oils and chemicals: <ul style="list-style-type: none"> » Where these cannot be recycled, appropriate disposal must be arranged with a licensed facility in consultation with the administering authority. » Waste must be stored and handled according to the relevant legislation and regulations. | O&M Operator | Operation phase |
| General waste must be recycled where possible or disposed of at an appropriately licensed landfill. | O&M Operator | Operation phase |
| Spill kits must be made available on-site for the clean-up of spills and leaks of contaminants. | O&M Operator | Operation and maintenance |
| Hazardous waste (including hydrocarbons) and general waste must be stored and disposed of separately. | O&M Operator | Operation phase |
| Disposal of waste must be in accordance with relevant legislative requirements, including the use of licensed contractors. | O&M Operator/ waste management contractor | Operation phase |

| Mitigation: Action/control | Responsibility | Timeframe |
|---|----------------|-----------------|
| No waste may be burned or buried on site. | O&M Operator | Operation phase |

| | |
|---------------------------------|---|
| Performance Indicator | <ul style="list-style-type: none"> » No complaints received regarding waste on site or dumping. » Internal site audits identifying that waste segregation, recycling and reuse is occurring appropriately. » Provision of all appropriate waste manifests. » No contamination of soil. |
| Monitoring and Reporting | <ul style="list-style-type: none"> » Waste collection must be monitored internally on a regular basis. » Waste documentation must be completed and made available for inspection on request. » An incidents/complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon. » Regular reports on exact quantities of all waste streams exiting the site must be compiled by the waste management contractor and monitored by the environmental manager. All appropriate waste disposal certificates must accompany the monthly reports. |

OBJECTIVE 7: Maximise benefits and opportunities for local communities associated with the operation of the solar facility

| | |
|-------------------------------------|---|
| Project component/s | <ul style="list-style-type: none"> » Solar facility. » Day to day operational activities associated with the solar facility including maintenance. |
| Potential Impact | <ul style="list-style-type: none"> » The opportunities and benefits associated with the creation of local employment and business should be maximised as far as possible. |
| Activity/risk source | <ul style="list-style-type: none"> » The operation phase of the solar facility will create permanent employment opportunities. » The establishment of a solar facility has the potential to create an attraction for visitors to the area. The development also has the potential to promote the benefits of renewable energy projects. |
| Mitigation: Target/Objective | <ul style="list-style-type: none"> » Create medium- to long-term full time employment opportunities for locals. |

| Mitigation: Action/control | Responsibility | Timeframe |
|---|----------------|-----------------|
| The project developer should make effort to use locally sourced inputs where feasible in order to maximize the benefit to the local economy. | O&M Operator | Operation phase |
| Local Small and Medium Enterprises are to be approached to investigate the opportunities for supplying inputs required for the maintenance and operation of the facility, as far as feasible. | O&M Operator | Operation phase |
| Where feasible, effort must be made to employ locally in order to create maximum benefit for the communities. | O&M Operator | Operation phase |

| | |
|---------------------------------|---|
| Performance Indicator | <ul style="list-style-type: none"> » Maximum amount of semi and unskilled labour locally sourced where possible. » Local suppliers and SMMEs contracted where possible. |
| Monitoring and Reporting | <ul style="list-style-type: none"> » Indicators listed above must be met for the operation phase. |

OBJECTIVE 8: Implement an appropriate fire management plan during the operation phase

The vegetation on the site may be at risk of fire, especially during drought conditions experienced in the area. The increased presence of people on the site could increase the risk of veld fires, particularly in the dry season.

| | |
|-------------------------------------|---|
| Project Component/s | » Operation and maintenance of the solar facility and associated infrastructure. |
| Potential Impact | » Veld fires can pose a personal safety risk to local farmers and communities, and their homes, crops, livestock and farm infrastructure, such as gates and fences. In addition, fire can pose a risk to the solar facility infrastructure. |
| Activities/Risk Sources | » The presence of operation and maintenance personnel and their activities on the site can increase the risk of veld fires. |
| Mitigation: Target/Objective | » To avoid and or minimise the potential risk of veld fires on local communities and their livelihoods. |

| Mitigation: Action/Control | Responsibility | Timeframe |
|--|-----------------------|------------------|
| Provide adequate firefighting equipment on site. Apply for membership to the local Fire Protection Association, should there be one. | O&M Operator | Operation phase |
| Provide fire-fighting training to selected operation and maintenance staff. | O&M Operator | Operation phase |
| Ensure that appropriate communication channels are established to be implemented in the event of a fire. | O&M Operator | Operation phase |
| Fire breaks should be established where and when required. Cognisance must be taken of the relevant legislation when planning and burning firebreaks (in terms of timing, etc.). Access roads may also act as fire breaks. | O&M Operator | Operation phase |
| Upon completion of the construction phase, an emergency evacuation plan must be drawn up to ensure the safety of the staff and surrounding land users in the case of an emergency. | O&M Operator | Operation phase |
| Contact details of emergency services should be prominently displayed on site. | O&M Operator | Operation phase |

| | |
|---------------------------------|--|
| Performance Indicator | » Firefighting equipment and training provided before the construction phase commences. » Appropriate fire breaks in place. |
| Monitoring and Reporting | » The Developer must monitor indicators listed above to ensure that they have been met. |

8.2. Monitoring Programme: Operation Phase of the Harmony Joel Solar PV Facility

OBJECTIVE 9: To monitor the performance of the control strategies employed against environmental objectives and standards

A monitoring programme must be in place not only to ensure conformance with the EMPr, but also to monitor any environmental issues and impacts which have not been accounted for in the EMPr that are, or could result in significant environmental impacts for which corrective action is required. An internal environmental audit must be conducted every 6 months and an external audit must be conducted once a year in order to confirm compliance with the requirements of all environmental permits (including the Environmental Authorisation, once issued) for the project, this EMPr, and all relevant legislation. The results of the audit reports must be made available to the DESTEA and the relevant authorities on request, and must be part of monitoring and audit reports. An annual audit report must be compiled and submitted to DESTEA. The aim of the auditing process would be to routinely monitor the implementation of the specified environmental specifications, in order to:

- » Monitor and audit compliance with the prescriptive and procedural terms of the environmental specifications.
- » Ensure adequate and appropriate interventions to address non-compliance.
- » Ensure adequate and appropriate interventions to address environmental degradation.
- » Provide a mechanism for the lodging and resolution of public complaints.
- » Ensure appropriate and adequate record keeping related to environmental compliance.
- » Determine the effectiveness of the environmental specifications and recommend the requisite changes and updates based on audit outcomes, in order to enhance the efficacy of environmental management on site.
- » Aid in the communication and feedback to authorities and stakeholders.

CHAPTER 9: MANAGEMENT PROGRAMME: DECOMMISSIONING

The solar infrastructure which will be utilised for the Harmony Joel Solar PV Facility is expected to have a lifespan of up to 25 years (with maintenance). Equipment associated with this solar facility would only be decommissioned once it has reached the end of its economic life. It is most likely that decommissioning activities of the infrastructure of the solar facility would comprise the dismantling and replacement of the solar panels with more appropriate technology/infrastructure available at that time. It must be noted that decommissioning activities will need to be undertaken in accordance with the legislation applicable at that time, which may require this section of the EMPr to be revisited and amended.

The relevant mitigation measures contained under the construction section should be applied during decommissioning and therefore are not repeated in this section.

» **Site Preparation**

Site preparation activities will include confirming the integrity of the access to the site to accommodate the required equipment, preparation of the site (e.g. laydown areas, construction platform) and the mobilisation of construction equipment.

» **Dismantle and Remove Infrastructure**

The solar infrastructure (solar panels and mounting structures) of the solar facility will be dismantled once it reaches the end of its economic lifespan. Once dismantled, the components will be reused, recycled, or disposed of in accordance with regulatory requirements (NEMA / NEM:WA). All parts of the solar panels would be considered reusable or recyclable.

9.1. Objectives

In decommissioning the Harmony Joel Solar PV Facility, the Applicant must ensure that:

- » All structures not required for the post-decommissioning use of the site (may include the solar panels and mounting structures, substation, inverters and transformers, laydown areas, and O&M hub) are dismantled and/or demolished, removed and waste material disposed of at an appropriately licensed waste disposal site or as required by the relevant legislation.
- » Rehabilitate access/service roads and servitudes not required for the post-decommissioning use of the site. If necessary, an ecologist should be consulted to give input into rehabilitation specifications.
- » All disturbed areas are compacted, sloped and contoured to ensure drainage and runoff and to minimise the risk of erosion.
- » Monitor rehabilitated areas quarterly for at least a year following decommissioning and implement remedial action as and when required.
- » Any fauna encountered during decommissioning activities should be removed to safety by a suitably qualified person.
- » All vehicles to adhere to low speed limits (i.e. 30km/h max) on the site, to reduce risk of faunal collisions as well as reduce dust.
- » Retrenchments should comply with South African Labour legislation of the day.

The general specifications of Chapter 6 (Construction) and Chapter 7 (Rehabilitation) are also relevant to the decommissioning of the Harmony Joel Solar PV Facility and must be adhered to.

Appendix 1 – Substation EMPr

18MW HARMONY JOEL SOLAR PHOTOVOLTAIC (PV) FACILITY, FREE STATE PROVINCE

Environmental Management Programme for the
facility on-site substations associated with the
Harmony Joel Solar PV Facility

May 2023

ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR THE
DEVELOPMENT AND EXPANSION OF SUBSTATION INFRASTRUCTURE FOR THE
TRANSMISSION AND DISTRIBUTION OF ELECTRICITY



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

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INTRODUCTION

1. Background

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) requires that an environmental management programme (EMPr) be submitted where an environmental impact assessment (EIA) has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation (EA). The content of an EMPr must either contain the information set out in Appendix 4 of the Environmental Impact Assessment Regulations, 2014, as amended (EIA Regulations) or must be an EMPr relevant to an application as identified and gazetted by the Minister in a government notice. Once the Minister has identified, through a government notice that an EMPr is relevant to an application for EA, that EMPr must be applied by all parties involved in the EA process, including but not limited to the applicant and the competent authority (CA).

2. Purpose

This document constitutes an EMPr relevant to applications for the development or expansion of substation infrastructure for the transmission and distribution of electricity, and all listed and specified activities necessary for the realisation of such infrastructure.

3. Objective

The objective of this EMPr is to prescribe and pre-approve generally accepted impact management outcomes and impact management actions, which can commonly and repeatedly be used for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of substation infrastructure for the transmission and distribution of electricity. The use of an EMPr is intended to reduce the need to prepare and review individual EMPrs for applications of a similar nature.

4. Scope

The scope of this EMPr applies to the development or expansion of substation infrastructure for the transmission and distribution of electricity requiring EA in terms of NEMA. This EMPr applies to activities requiring EA, mainly activity 11 and 47 of the Environmental Impact Assessment Regulations Listing Notice 1 of 2014, as amended, and activity 9 of the Environmental Impact Assessment Regulations Listing Notice 2 of 2014, as amended, and all associated listed or specified activities necessary for the realization of such infrastructure.

5. Structure of this document

This document is structured in three parts with an Appendix as indicated in the table below:

| Part | Section | Heading | Content |
|------|---------|---|--|
| A | | Provides general guidance and information and is not legally binding | Definitions, acronyms, roles & responsibilities and documentation and reporting. |
| B | 1 | Pre-approved EMPr template | <p>Contains generally accepted impact management outcomes and impact management actions required for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of substation infrastructure for the transmission and distribution of electricity, which are presented in the form of a template that has been pre-approved.</p> <p>The template in this section is to be completed by the contractor, with each completed page signed and dated by the holder of the EA prior to commencement of the activity.</p> <p>Where an impact management outcome is not relevant, the words “not applicable” can be inserted in the template under the “responsible persons” column.</p> <p>Once completed and signed, the template represents the EMPr for the activity approved by the CA and is legally binding. The template is not required to be submitted to the CA as once the EMPr is gazetted for implementation, it has been approved by the CA.</p> <p>To allow interested and affected parties access to the pre-approved EMPr template for consideration through the decision-making process, the EAP on behalf of the applicant /proponent must make the hard copy of this EMPr available at a public location and where the applicant has a website, the EMPr should also be made available on such publicly accessible website.</p> |
| | 2 | Site specific information | Contains preliminary infrastructure layout and a declaration that the applicant/holder of the EA will comply with the pre-approved EMPr template contained in <u>Part B: Section 1</u> , and understands that the impact management outcomes and impact management actions are legally binding . The preliminary |

| Part | Section | Heading | Content |
|------|---------|---|---|
| | | | <p>infrastructure layout must be finalized to inform the final EMPr that is to be submitted with the basic assessment report (BAR) or environmental impact assessment report (EIAR), ensuring that all impact management outcomes and impact management actions have been either pre-approved or approved in terms of <u>Part C</u>.</p> <p>This section must be submitted to the CA together with the final BAR or EIAR. The information submitted to the CA will be considered to be incomplete should a signed copy of <u>Part B; section 2</u> not be submitted. Once approved, this Section forms part of the EMPr for the development and is legally binding.</p> |
| C | | Site specific sensitivities/ attributes | <p>If any specific environmental sensitivities/ attributes are present on the site which require site specific impact management outcomes and impact management actions, not included in the pre-approved EMPr, to manage impacts, these specific impact management outcomes and impact management actions must be included in this section. These specific environmental attributes must be referenced spatially and impact management outcomes and impact management actions must be provided. These specific impact management outcomes and impact management actions must be presented in the format of the pre-approved EMPr template (<u>Part B: section 1</u>)</p> <p>This section will not be required should the site contain no specific environmental sensitivities or attributes. However, if <u>Part C</u> is applicable to the site, it is required to be submitted together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. Once approved, Part C forms part of the EMPr for the site and is legally binding.</p> <p>This section applies only to additional impact management outcomes and impact management actions that are necessary for the</p> |

| Part | Section | Heading | Content |
|------------|---------|---------|---|
| | | | avoidance, management and mitigation of impacts and risks associated with the specific development or expansion and which are not already included in Part B: section 1 . |
| Appendix 1 | | | Contains the method statements to be prepared prior to commencement of the activity. The method statements are not required to be submitted to the competent authority. |

6. Completion of part B: section 1: the pre-approved EMPr template

The template is to be completed prior to commencement of the activity, by providing the following information for each environmental impact management action:

- For implementation
 - a 'responsible person',
 - a method for implementation,
 - a timeframe for implementation
- For monitoring
 - a responsible person
 - frequency
 - evidence of compliance.

The completed template must be signed and dated by 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 be signed and dated on each page by 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.

7. Amendments of the impact management outcomes and impact management actions

Once the activity has commenced, a holder of an EA may make amendments to the impact management outcomes and impact management actions in the following manner:

- Amendment of the impact management outcomes: in line with the process contemplated in Regulation 37 of the EIA Regulations; and
- Amendment of the impact management actions: in line with the process contemplated in Regulation 36 of the EIA Regulations.

8. Documents to be submitted as part of part B: section 2 site specific information and declaration

[Part B: Section 2](#) has three distinct sub-sections. The first and third sub-sections are in a template format. Sub-section two requires a map to be produced.

Sub-section 1 contains the project name, the applicant's name and contact details, the site information, which includes coordinates of the property or farm in which the proposed substation infrastructure is proposed as well as the 21-digit Surveyor General code of each cadastral land parcel and, where available, the farm name.

Sub-section 2 is to be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout using the national web based environmental screening tool, when available for compulsory use at: <https://screening.environment.gov.za/screeningtool>. The sensitivity map shall identify the nature of each sensitive feature e.g. threatened plant species, archaeological site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features and within 50 m from the development footprint.

Sub-section 3 is the declaration that the applicant (s)/proponent (s) or holder of the EA in the case of a change of ownership must complete which confirms that the applicant/EA holder will comply with the pre-approved 'EMPr' template in Section 1 and understands that the impact management outcomes and impact management actions are legally binding.

(a) Amendments to Part B: Section 2 – site specific information and declaration

Should the EA be transferred, Part B: Section 2 must be completed by the new applicant/proponent and submitted with the application for an amendment of the EA in terms of regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted as part of such an application for an amendment to an EA will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

PART A – GENERAL INFORMATION

1. DEFINITIONS

In this EMPr any word or expression to which a meaning has been assigned in the NEMA or EIA Regulations has that meaning, and unless the context requires otherwise –

"clearing" means the clearing and removal of vegetation, whether partially or in whole, including trees and shrubs, as specified;

"construction camp" is the area designated for key construction infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous 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;

"contractor" - The Contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract, are in line with the Environmental Management Programme and that Method Statements are implemented as described.

"hazardous substance" is a substance governed by the Hazardous Substances Act, 1973 (Act No. 15 of 1973) as well as the Hazardous Chemical and Substances Regulations, 1995;

"method statement" means a written submission by the Contractor to the Project Manager in response to this EMPr or a request by the Project Manager and ECO. The method statement must set out the equipment, materials, labour and method(s) the Contractor proposes using to carry out an activity identified by the Project Manager when requesting the Method Statement. This must be done in such detail that the Project Manager and ECO is able to assess whether the Contractor's proposal is in accordance with this specification and/or will produce results in accordance with this specification;

The method statement must cover as a minimum applicable details with regard to:

- (i) Construction procedures;
- (ii) Plant, materials and equipment to be used;
- (iii) Transporting the equipment to and from site;
- (iv) How the plant/ material/ equipment will be moved while on site;
- (v) How and where the plant/ material/ equipment will be stored;
- (vi) The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- (vii) Timing and location of activities;
- (viii) Compliance/ non-compliance; and
- (ix) Any other information deemed necessary by the Project Manager.

"slope" means the inclination of a surface expressed as one unit of rise or fall for so many horizontal units;

“**solid waste**” means all solid waste, including construction debris, hazardous waste, excess cement/ concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers);

“**spoil**” means excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works;

“**topsoil**” means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility, appearance, structure, agricultural potential, fertility and composition of the soil;

“**works**” means the works to be executed in terms of the Contract

2. ACRONYMS and ABBREVIATIONS

| | |
|--------------------|--|
| CA | Competent Authority |
| cEO | Contractors Environmental Officer |
| dEO | Developer Environmental Officer |
| DPM | Developer Project Manager |
| DSS | Developer Site Supervisor |
| EAR | Environmental Audit Report |
| ECA | Environmental Conservation Act No. 73 of 1989 |
| ECO | Environmental Control Officer |
| EA | Environmental Authorisation |
| EIA | Environmental Impact Assessment |
| ERAP | Emergency Response Action Plan |
| EMPr | Environmental Management Programme Report |
| EAP | Environmental Assessment Practitioner |
| FPA | Fire Protection Agency |
| HCS | Hazardous chemical Substance |
| NEMA | National Environmental Management Act, 1998 (Act No. 107 of 1998) |
| NEMBA | National Environmental Management: Biodiversity Act ,2004 (Act No. 10 of 2004) |
| NEMWA | National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) |
| MSDS | Material Safety Data Sheet |
| RI&AP's | Registered Interested and affected parties |

3. ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) IMPLEMENTATION

The effective implementation of this EMPr is dependent on established and clear roles, responsibilities and reporting lines within an institutional framework. This section of the EMPr gives guidance to the various environmental roles and reporting lines, however, project specific requirements will ultimately determine the need for the appointment of specific person(s) to undertake specific roles and or responsibilities. As such, it must be noted that in the event that no specific person, for example, an environmental control officer (ECO) is appointed, the holder of the EA remains responsible for ensuring that the duties indicated in this document for action by the ECO are undertaken.

Table 1: Guide to roles and responsibilities for implementation of an EMPr

| Responsible Person(s) | Role and Responsibilities |
|-----------------------------------|---|
| Developer's Project Manager (DPM) | <p><u>Role</u></p> <p>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.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - 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. |

| Responsible Person(s) | Role and Responsibilities |
|-------------------------------------|--|
| Developer Site Supervisor (DSS) | <p><u>Role</u> 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.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - 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) | <p><u>Role</u> 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.</p> <p>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</p> |

| Responsible Person(s) | Role and Responsibilities |
|-----------------------|--|
| | <p>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.</p> <p><u>Responsibilities</u></p> <p>The responsibilities of the ECO will include the following:</p> <ul style="list-style-type: none"> - 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 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; |

| Responsible Person(s) | Role and Responsibilities |
|--|---|
| | <ul style="list-style-type: none"> - 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. |
| <p>developer Environmental Officer (dEO)</p> | <p><u>Role</u></p> <p>The dEOs will report to the Project Manager and are responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - 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; |

| Responsible Person(s) | Role and Responsibilities |
|-----------------------|---|
| | <ul style="list-style-type: none"> - 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 | <p><u>Role</u></p> <p>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.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - 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. |

| Responsible Person(s) | Role and Responsibilities |
|--|---|
| contractor Environmental Officer (cEO) | <p><u>Role</u></p> <p>Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria:</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - 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. |

4. ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE

To ensure accountable and demonstrated implementation of the EMPr, a number of reporting systems, documentation controls and compliance mechanisms must be in place for all substation infrastructure projects as a minimum requirement.

4.1 Document control/Filing system

The holder of the EA is solely responsible for the upkeep and management of the EMPr file. As a minimum, all documentation detailed below will be stored in the EMPr file. A hard copy of all documentation shall be filed, while an electronic copy may be kept where relevant. A duplicate file will be maintained in the office of the DSS (where applicable). This duplicate file must remain current and up-to-date. The filing system must be updated and relevant documents added as required. The EMPr file must be made available at all times on request by the CA or other relevant authorities. The EMPr file will form part of any environmental audits undertaken as prescribed in the EIA Regulations.

4.2 Documentation to be available

At the outset of the project the following preliminary list of documents shall be placed in the filing system and be accessible at all times:

- Full copy of the signed EA from the CA in terms of NEMA, granting approval for the development or expansion;
- Copy of the EMPr as well as any amendments thereof;
- Copy of declaration of implementing EMPr and subsequent approval of site specific EMPr and amendments thereof;
- All method statements;
- Completed environmental checklists;
- Minutes and attendance register of environmental site meetings;
- An up-to-date environmental incident log;
- A copy of all instructions or directives issued;
- A copy of all corrective actions signed off. The corrective actions must be filed in such a way that a clear reference is made to the non-compliance record;
- Complaints register.

4.3 Weekly Environmental Checklist

The ECOs are required to complete a Weekly Environmental Checklist, the format of which is to be agreed prior to commencement of the activity. The ECOs are required to sign and date the checklist, retain a copy in the EMPr file and submit a copy of the completed checklist to the DSS on a weekly basis.

The checklists will form the basis for the Monthly Environmental Reports. Copies of all completed checklists will be attached as Annexures to the Environmental Audit Report as required in terms of the EIA Regulations.

4.4 Environmental site meetings

Minutes of the environmental site meetings shall be kept. The minutes must include an attendance register and will be attached to the Monthly Report that is distributed to attendees. Each set of minutes must clearly record "Matters for Attention" that will be reviewed at the next meeting.

4.5 Required Method Statements

The method statement will be done in such detail that the ECOs are enabled to assess whether the contractor's proposal is in accordance with the EMPr.

The method statement must cover applicable details with regard to:

- development procedures;
- materials and equipment to be used;
- getting the equipment to and from site;
- how the equipment/ material will be moved while on site;
- how and where material will be stored;
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- timing and location of activities;
- compliance/ non-compliance with the EMPr; and
- any other information deemed necessary by the ECOs.

Unless indicated otherwise by the Project Manager, the Contractor shall provide the following method statements to the Project Manager no less than 14 days prior to the commencement date of the activity:

- Site establishment – Camps, Lay-down or storage areas, satellite camps, infrastructure;
- Batch plants;
- Workshop or plant servicing;
- Handling, transport and storage of Hazardous Chemical Substance's;
- Vegetation management – Protected, clearing, aliens, felling;
- Access management – Roads, gates, crossings etc.;
- Fire plan;
- Waste management – transport, storage, segregation, classification, disposal (all waste streams);
- Social interaction – complaints management, compensation claims, access to properties etc.;
- Water – use (source, abstraction and disposal), access and all related information, crossings and mitigation;
- Emergency preparedness – Spills, training, other environmental emergencies;
- Dust and noise management methodologies;
- Fauna interaction and risk management – only if the risk was identified – wildlife interaction especially on game farms; and
- Heritage and palaeontology management.

The ECOs shall monitor and ensure that the contractors perform in accordance with these method statements. Completed and agreed method statements between the holder of the EA and the contractor shall be captured in Appendix 1.

4.6 Environmental Incident Log (Diary)

The ECOs are required to maintain an up-to-date and current Environmental Incident Log (environmental diary). The Environmental Incident Log is a means to record all environmental incidents and/or all non-compliance notice would not be issued. An environmental incident is defined as:

- Any deviation from the listed impact management actions (listed in this EMPr) that may be addressed immediately by the ECOs. (For example a contractor's staff member littering or a drip tray that has not been emptied);
- Any environmental impact resulting from an action or activity by a contractor in contravention of the environmental stipulations and guidelines listed in the EMPr which as a single event would have a minor impact but which if cumulative and continuous would have a significant effect (for example no toilet paper available in the ablutions for an afternoon); and
- General environmental information such as road kills or injured wildlife.

The ECOs are to record all environmental incidents in the Environmental Incident Log. All incidents regardless of severity must be reported to the Developer. The Log is to be kept in the EMPr file and at a minimum the following will be recorded for each environmental incident:

- The date and time of the incident;
- Description of the incident;
- The name of the Contractor responsible;
- The incident must be listed as significant or minor;
- If the incident is listed as significant, a non-compliance notice must be issued, and recorded in the log;
- Remedial or corrective action taken to mitigate the incident; and
- Record of repeat minor offences by the same contractor or staff member.

The Environmental Incident Log will be captured in the EAR.

4.7 Non-compliance

A non-compliance notice will be issued to the responsible contractor by the ECOs via the DSS or Project Manager. The non-compliance notice will be issued in writing; a copy filed in the EMPr file and will at a minimum include the following:

- Time and date of the non-compliance;
- Name of the contractor responsible;
- Nature and description of the non-compliance;
- Recommended / required corrective action; and
- Date by which the corrective action to be completed.
- The contractors shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the development site pertaining to the environment shall be

recorded in a dedicated register and the response noted with the date and action taken. The ECO should be made aware of any complaints. Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed. Failure to redress the cause shall be reported to the relevant CA for them to deal with the transgression, as it deems fit. The contractor is deemed not to have complied with the EMPr if, inter alia, There is a deviation from the environmental conditions, impact management outcomes and impact management actions activities, as approved EMPr as relevant as set out in the EMPr, which deviation has, or may cause, an environmental impact.

4.8 Corrective action records

For each non-compliance notice issued, a documented corrective action must be recorded. On receiving a non-compliance notice from the DSS, the contractor's cEO will ensure that the corrective actions required take place within the stipulated timeframe. On completion of the corrective action the cEO is to issue a Corrective Action Report in writing to the ECOs. If satisfied that the corrective action has been completed, the ECOs are to sign-off on the Corrective Action Report, and attach the report to the non-compliance notice in the EMPr file. A corrective action is considered complete once the report has signed off by the ECOs.

4.9 Photographic record

A digital photographic record will be kept. The photographic record will be used to show before, during and post rehabilitation evidence of the project as well used in cases of damages claims if they arise. Each image must be dated and a brief description note attached.

The Contractor shall:

1. Allow the ECOs access to take photographs of all areas, activities and actions.

The ECOs shall keep an electronic database of photographic records which will include:

1. Pictures of all areas designated as work areas, camp areas, development sites and storage areas taken before these areas are set up;
2. All bunding and fencing;
3. Road conditions and road verges;
4. Condition of all farm fences;
5. Topsoil storage areas;
6. All areas to be cordoned off during construction;
7. Waste management sites;
8. Ablution facilities (inside and out);
9. Any non-conformances deemed to be "significant";
10. All completed corrective actions for non-compliances;
11. All required signage;
12. Photographic recordings of incidents;
13. All areas before, during and post rehabilitation; and
14. Include relevant photographs in the Final Environmental Audit Report.

4.10 Complaints register

The ECOs shall keep a current and up-to-date complaints register. The complaints register is to be a record of all complaints received from communities, stakeholders and individuals. The Complaints Record shall:

1. Record the name and contact details of the complainant;
2. Record the time and date of the complaint;
3. Contain a detailed description of the complaint;
4. Where relevant and appropriate, contain photographic evidence of the complaint or damage (ECOs to take relevant photographs); and
5. Contain a copy of the ECOs written response to each complaint received and keep a record of any further correspondence with the complainant. The ECO's written response will include a description of any corrective action to be taken and must be signed by the Contractor, ECO and affected party. Where a damage claim is issued by the complainant, the ECOs shall respond as described in **(section 4.11)** below.

4.11 Claims for damages

In the event that a Claim for Damages is submitted by a community, landowner or individual, the ECOs shall:

1. Record the full detail of the complaint as described in **(section 4.10)** above;
2. The DPM will evaluate the claim and associated damage and submit the evaluation to the Senior Site Representative for approval;
3. Following consideration by the DPM, the claim is to be resolved and settled immediately, or the reason for not accepting the claim communicated in writing to the claimant. Should the claimant not accept this, the ECO shall, in writing report the incident to the Developer's negotiator and legal department; and
4. A formal record of the response by the ECOs to the claimant as well as the rectification of the method of making payments not amount will be recorded in the EMPr file.

4.12 Interactions with affected parties

Open, transparent and good relations with affected landowners, communities and regional staff are an essential aspect to the successful management and mitigation of environmental impacts.

The ECOs shall:

1. Ensure that all queries, complaints and claims are dealt within an agreed timeframe;
2. Ensure that any or all agreements are documented, signed by all parties and a record of the agreement kept in the EMPr file;
3. Ensure that a complaints telephone numbers are made available to all landowners and affected parties; and
4. Ensure that contact with affected parties is courteous at all times;

4.13 Environmental audits

Internal environmental audits of the activity and implementation of the EMPr must be undertaken. The findings and outcomes included in the EMPr file and submitted to the CA at intervals as indicated in the EA.

The ECOs must prepare a monthly EAR. The report will be tabled as the key point on the agenda of the Environmental Site Meeting. The Report is submitted for acceptance at the meeting and the final report will be circulated to the Project Manager and filed in the EMPr file. At a frequency determined by the EA, the ECOs shall submit the monthly reports to the CA. At a minimum the monthly report is to cover the following:

- Weekly Environmental Checklists;
- Deviations and non-compliances with the checklists;
- Non-compliances issued;
- Completed and reported corrective actions;
- Environmental Monitoring;
- General environmental findings and actions; and
- Minutes of the Bi-monthly Environmental Site Meetings.

4.14 Final environmental audits

On final completion of the rehabilitation and/or requirements of the EA a final EAR is to be prepared and submitted to the CA. The EAR must comply with Appendix 7 of the EIA Regulations.

PART B: SECTION 1: Pre-approved EMPr template

5. IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS

This section provides a pre-approved 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 contractor 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; | ECO / cEO / dEO | Hold environmental awareness training workshops | Pre-construction Construction and Operations | ECO dEO | Monthly and as and when required | Attendance register and training minutes / notes for the record |
| – The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course; | Contractor | Scheduling of sufficient sessions through consultation with the ECO / cEO / dEO | Pre-construction Construction | ECO dEO | Monthly and as and when required | Attendance register and training minutes / notes for the record |
| – Refresher environmental awareness training is available as and when required; | cEO / dEO in consultation with the ECO | Hold refresher environmental awareness training workshops | During the construction phase | ECO dEO | Monthly and as and when required | Attendance register and training minutes / notes for the record |
| – 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; | cEO / dEO | Hold training workshops and ensure that the EA and EMPr is readily available | During the construction phase | ECO dEO | Monthly and as and when required | Attendance register and training minutes / notes for the record |

| | | | | | | |
|---|--|--|-------------------------------|-------------------|---|--|
| <ul style="list-style-type: none"> - The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum: <ul style="list-style-type: none"> a) Safety notifications; and b) No littering. | Contractor | Develop and place appropriate posters at key locations | Pre-construction Construction | ECO dEO cEO | Monthly | Photographic record |
| <ul style="list-style-type: none"> - Environmental awareness training must include as a minimum the following: <ul style="list-style-type: none"> 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. | cEO / dEO in consultation with the ECO | Develop environmental awareness training material which covers the minimum requirements | Pre-construction Construction | ECO dEO | Prior to the commencement of the environmental awareness training | Environmental awareness training material requirements checklist |
| <ul style="list-style-type: none"> - A record of all environmental awareness training courses undertaken as part of the EMPr must be available; | ECO / cEO / dEO | Filing system including all proof of training (i.e. attendance register and training minutes / notes for the record) | During the construction phase | ECO dEO | Monthly | Completed and up to date filing system with proof of training |
| <ul style="list-style-type: none"> - Educate workers on the dangers of open and/or unattended fires; | cEO / dEO in consultation with the ECO | Develop environmental awareness training | Pre-construction Construction | ECO dEO | Prior to the commencement of the | Environmental awareness training |

| | | | | | | |
|---|-----------------|---|-------------------------------|---------|----------------------------------|---|
| | | material which covers the dangers of open and/or unattended fire | | | environmental awareness training | material requirements checklist |
| - A staff attendance register of all staff to have received environmental awareness training must be available. | ECO / cEO / dEO | Filing system including all proof of training (i.e. attendance register) | During the construction phase | ECO dEO | Monthly | Completed and up to date filing system inclusive of all attendance registers |
| - Course material must be available and presented in appropriate languages that all staff can understand. | ECO / cEO / dEO | Develop environmental awareness training material in the required languages. Training material must be readily available to all staff | During the construction phase | ECO dEO | Monthly | Environmental awareness training material requirements checklist and the training register which must indicate the language of the training |

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 |
| <ul style="list-style-type: none"> - A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management; | Contractor | Development of an appropriate method statement | Pre-construction | ECO dEO | Once, prior to construction | Availability of the method statement which complies with the minimum requirements listed |
| <ul style="list-style-type: none"> - 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; | DPM | Place construction camps outside of sensitive areas identified in the Basic Assessment Report | Pre-construction Construction | ECO dEO | Once, prior to construction | Availability of a layout and sensitivity map indicating avoidance of sensitive areas |
| <ul style="list-style-type: none"> - Sites must be located where possible on previously disturbed areas; | DPM | Place site outside of sensitive areas and within previously disturbed areas | Pre-construction | ECO dEO | Once, prior to construction | Availability of a layout and sensitivity map indicating |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|---------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | identified in the BA Report | | | | avoidance of sensitive areas and placement within disturbed areas |
| – The camp must be fenced in accordance with Section 5.5: Fencing and gate installation ; and | DPM | Design and implementation of fencing as per the requirements of Section 5.5 of this EMPr | Pre-construction & Construction | ECO dEO | Once, prior to construction and once during the construction of the fencing | The camp is fenced in accordance with Section 5.5 of this EMPr |
| – The use of existing accommodation for contractor staff, where possible, is encouraged. | DPM | Identify existing accommodation for contractor staff | Pre-construction & Construction | ECO dEO | Once, prior to construction | Contractor staff are accommodated in existing accommodation |

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; | dEO / cEO in consultation with the ECO | Spatially demarcate access restricted areas informed by the BA Report | Pre-construction | ECO | Once, prior to construction | Access restricted areas are identified and provided in a spatial format |
| – 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 | dEO / cEO in consultation with the ECO | Erect appropriate temporary barriers around access restricted areas | At the commencement and for the duration of the construction phase | ECO | Monthly | Access restricted areas are closed-off through temporary barriers and barriers are maintained to a sufficient standard |
| – Unauthorised access and development related activity inside access restricted areas is prohibited. | Contractor / dEO / cEO | Erect appropriate temporary barriers around access restricted areas and provide clear signage of restricted status | During the construction phase | ECO | Monthly, and as and when required | Photographic evidence and notes of compliance that no unauthorised access or |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---------------------------|--------------------|--------------------------|------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | activities has taken place within the access restricted areas |

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; | DPM Contractor | Develop access agreements with the affected landowners. Ensure that agreements are approved and signed | Pre-construction | dEO ECO | Once, prior to construction | Availability of approved and signed negotiations |
| – 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 | Contractor | Undertake maintenance activities on private roads used for construction as | During the construction phase | cEO / ECO | Weekly | Photographic record of the pre-construction condition |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|------------------------------------|---|---------------------------------|--------------------|-----------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | degradation takes place | | | | and degradation of roads, and records of the implementation and effectiveness of maintenance activities |
| - All contractors must be made aware of all these access routes. | dEO / cEO | Develop a map illustrating all access routes associated with the project and present and provide the map to all contractors | Pre-construction Construction | ECO | Once, prior to construction | Access routes map readily available |
| - Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense; | Contractor | All access routes developed that are not in-line with the access route agreements must be closed and rehabilitated to the pre-disturbance state | Construction and Rehabilitation | cEO ECO | Bi-weekly (every two weeks) | Photographic record of the closure of access roads and re-vegetation |
| - Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads; | Contractor (and Eskom maintenance) | Existing access routes to be used must be specified | Construction and operation | cEO Operation and | Weekly | Implementation of the |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|------------------------------------|---|-------------------------------|--------------------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | staff where relevant to operation) | and the development of new roads must be avoided as far as possible | | maintenance team | | approved layout |
| – 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; | dEO / cEO | Record the conditions of private roads to be used (prior to use) as per the requirements of section 4.9 and agree on the required condition of the roads with the landowner, DPM and contractor | During the construction phase | ECO | Prior to the use of private roads | Photographic record and proof of the road conditions agreed upon with the relevant parties |
| – Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands | DPM and Contractor | Design access roads to follow fence lines and avoid vegetated areas | Pre-construction | ECO | Once during the design and once prior to construction | Implementation of the approved layout |
| – Access roads must only be developed on pre-planned and approved roads. | Contractor | Construction of access roads only on pre-planned and approved access roads | During the construction phase | ECO once during the design dEO | Once during the design and weekly during the construction | Implementation of the approved layout |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---------------------------|--------------------|--------------------------|------------------------------|--------------------|-------------------|------------------------|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | n of access 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; | Contractor | Identify and inform all relevant staff of the existing gates to be used | Pre-construction & Construction | dEO | Monthly | Existing gates are utilised on a frequent basis and only limited new access gates are developed |
| – Existing and new gates to be recorded and documented in accordance with section 4.9: photographic record; | ECO | Existing and new gates will be recorded and documented as per the requirements of section 4.9 | During the construction phase | ECO | Once, when the construction of all new gates have been completed | Photographic record of the existing and new gates as per the requirements of section 4.9 |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-------------------------------|---|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner; | Contractor | Ensure all relevant gates are fitted with locks and are always locked | Construction and Operation | ECO monthly, Operation and maintenance team and cEO | Bi-weekly (every second week) | All gates are locked and no complaints from landowners are received in this regard |
| – 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; | dEO | Install new gates where required with the approval of the affected landowner | During the construction phase | ECO | Once, prior to construction and during the construction phase, as and when required | New gates are installed where the power line crosses fences |
| – 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; | Contractor | Install gates in a manner so that there is a gap of no more than 100mm between the bottom of the gate and the ground | During the construction phase | cEO | Once, during the erection of the gates during the construction phase | New gates installed as per the requirement |
| – Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate; | Contractor | Implement a reinforced concrete sill beneath gates installed for jackal proofing | During the construction phase | cEO | Once, during the erection of the gates during the construction phase | New gates installed as per the requirement |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|------------------------|---|-------------------------------|--------------------|--|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - Original tension must be maintained in the fence wires; | Contractor | Maintain original tension of fences through required activities | During the construction phase | ECO | Monthly | No tension reduction on fence wires |
| - All gates installed in electrified fencing must be re-electrified; | Contractor | Electrify gates installed in electrified fencing | During the construction phase | ECO | Once, during the erection of the gates during the construction phase | Gates installed in electrified fencing is electrified |
| - All demarcation fencing and barriers must be maintained in good working order for the duration of the development activities; | Contractor | Undertake maintenance activities on fences and barriers | During the construction phase | ECO | Monthly | Photographic record of maintained fences and barriers |
| - Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where applicable; | Contractor | Fence construction camps, batching plants, hazardous storage areas and access restricted areas. Avoid sensitive flora | During the construction phase | ECO | Once during the erection of fencing | Photographic record of fences erected |
| - Any temporary fencing to restrict the movement of livestock must only be erected with the permission of the land owner. | dEO/ cEO Contractor | Obtain written approval from the relevant landowner where temporary fencing is required to | During the construction phase | ECO | To be monitored as temporary fencing is required | Written approval to be provided by the dEO |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|--------------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | restrict livestock movement | | | | |
| – All fencing must be developed of high quality material bearing the SABS mark; | Contractor | Make use of high quality materials approved by SABS | During the construction phase | cEO | To be monitored as fencing is erected during the construction phase | Use of high quality materials for fencing approved by SABS |
| – The use of razor wire as fencing must be avoided; | Contractor | Razor wire must not be sourced or used for the erection of fencing | During the construction phase | ECO | To be monitored as fencing is erected during the construction phase | Fences erected do not make use of razor wire |
| – 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; | DSS and Contractor | Ensure fenced areas are locked as required through the implementation of a formalised process. Appoint a security company | During the construction phase | cEO | Weekly and as and when required | Fences are locked and no complaints from landowners are received. A security company is appointed |
| – On completion of the development phase all temporary fences are to be removed; | Contractor | Removal of all temporary fences | At the end of the Construction Phase | ECO dEO | Once, following the completion | No temporary fences associated |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|--------------------------------------|--------------------|--|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | of the construction phase | with the project is present following the completion of the construction phase |
| <ul style="list-style-type: none"> - The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely. | Contractor | Appropriate removal of all fence uprights | At the end of the Construction Phase | ECO dEO | Once, following the completion of the construction phase | No fence uprights associated with the project is present following the completion of the construction phase |

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 |
| <ul style="list-style-type: none"> - All abstraction points or bore holes must be registered with the DWS and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis; | DPM and Contractor | Obtaining relevant registrations from DWS and installation of water meters | Pre-construction | cEO | To be monitored with the installation of water meters and daily during construction and operation | Use of high quality water meters |
| <ul style="list-style-type: none"> - The Contractor must ensure the following: <ul style="list-style-type: none"> 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. | Not applicable - water will not be abstracted from a river | | | | | |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|--|-------------------------------|--------------------|-----------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| <ul style="list-style-type: none"> - Ensure water conservation is being practiced by: <ul style="list-style-type: none"> 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. | Contractor / dEO / cEO in consultation with the ECO | Implement the required water conservation measures throughout on-site construction processes | During the construction phase | ECO | Monthly, and as and when required | Successful implementation of water conservation |

5.7 Storm and waste water management

Impact management outcome: Impacts to the environment caused by storm water 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 |
| <ul style="list-style-type: none"> - 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; | Contractor | Implement measures for the control and management of runoff | During the construction phase | cEO | Weekly | No mismanagement of runoff or contaminated water due to the temporary concrete batching plant |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|----------------------------------|--|-------------------------------|--------------------|--|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| <p>– 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;</p> | Contractor and cEO | Obtain approved absorbent material and make use of licensed waste disposal facilities for disposal of oil | During the Construction Phase | ECO | Monthly | Availability of approved absorbent material at the construction site and proof of disposal of oil at licensed disposal facilities |
| <p>– Natural storm water 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;</p> | DPM in consultation with the ECO | Consultation between the DPM and the ECO to determine if water can be discharged directly into water bodies (where present). The necessary water quality testing must be undertaken prior to discharge | During the construction phase | ECO | As and when the need arises to discharge natural stormwater runoff and clean water | Proof of consultation between the DPM and ECO and the outcomes thereof to be provided. Proof of water quality testing and the results thereof. |
| <p>– 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.</p> | DPM in consultation with the ECO | Consultation between the DPM and the ECO to determine if water can be released following settling. | During the construction phase | ECO | As and when the need arises to discharge settled water | Proof of consultation between the DPM and ECO and the outcomes |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---------------------------|--------------------|--------------------------|------------------------------|--------------------|-----------|-------------------------|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | thereof to be provided. |

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; | Contractor | Develop and implement a waste management plan | During the construction phase | ECO | Monthly | Implementation of the waste management plan and proof of waste management through proof of responsible disposal |
| – Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided; | Contractor | Provision of appropriate waste collection bins | During the construction phase | cEO | Weekly | Appropriate waste collection |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|-------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | strategically placed throughout the site | | | | bins are available throughout the site |
| – A suitably positioned and clearly demarcated waste collection site must be identified and provided; | DPM and Contractor | Identify an appropriate location for the waste collection site which must be clearly demarcated through signage and temporary fencing | Design and Construction Phase | ECO | Once, prior to the commencement of construction | A waste collection site is appropriately placed and demarcated |
| – The waste collection site must be maintained in a clean and orderly manner; | Contractor | Regular collection of waste and maintenance of the area must be undertaken as per the waste requirements for the project during construction | During the Construction Phase | cEO | Weekly | The waste collection site is maintained and clean |
| – Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal; | Contractor | Provide separate and marked bins for the different waste types associated with the construction phase | During the Construction Phase | cEO | Weekly | Separate waste bins are available on site and waste generated is separated |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--|---|-------------------------------|--------------------|-----------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | into the relevant bins |
| – Staff must be trained in waste segregation; | cEO / dEO in consultation with the ECO | Include waste segregation as part of the environmental awareness training material. | Pre-construction Construction | ECO | Monthly, and as and when required | Environmental awareness training material requirements checklist |
| – Bins must be emptied regularly; | Contractor | Bins must be emptied before reaching total capacity and on a regular basis as required for the project | During the construction phase | ECO | Monthly | No mismanagement of bins. |
| – General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company; | Contractor | Disposal of general waste at licensed waste disposal facilities must be undertaken as per the waste management plan | During the construction phase | ECO | Monthly | Disposal certificates of disposal at licensed facilities to be provided |
| – Hazardous waste must be disposed of at a registered waste disposal site; | Contractor | Disposal of hazardous waste at licensed waste disposal facilities must be undertaken as per the waste | During the construction phase | ECO | Monthly | Disposal certificates of disposal at licensed facilities to be provided |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|-------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | management plan | | | | |
| – Certificates of safe disposal for general, hazardous and recycled waste must be maintained. | Contractor | Obtain certificates for safe disposal of waste | During the construction phase | ECO | Monthly | Disposal certificates of disposal at licensed facilities to be provided and filed as part of the filing system |

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; | Contractor | Contractor to undertake activities which can cause spills of pollutants outside of watercourses | During the construction phase | cEO | Weekly | No incidents reported of spillage of pollutants into watercourses |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|-------------------------------|--------------------|--|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - In the event of a spill, prompt action must be taken to clear the polluted or affected areas; | Contractor and cEO | Develop a management plan or process for implementation should a spill take place | During the construction phase | cEO | Weekly | Feedback must be provided by the contractor in terms of how the spill was handled and photographic evidence of the feedback must be provided and kept on record |
| - Where possible, no development equipment must traverse any seasonal or permanent wetland | cEO and Contractor | Ensure layout has been informed by the environmental sensitivities as determined by the basic assessment and specialist studies | Construction Phase | ECO | Once off review that the layout used is the approved one | Confirm no development equipment traverses any seasonal or permanent wetland as per the authorised layout by reviewing the as-built designs (once-off |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|---------------------------------------|---|--|--------------------|--|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance (confirmation) |
| | | | | | | |
| – No return flow into the estuaries must be allowed and no disturbance of the Estuarine functional Zone should occur; | Not applicable – no estuaries present | | | | | |
| – Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available; | cEO, Contractor | Ensure that permanent crossings (access roads) are provided for access to the substations if no alternative crossing is available. | During the construction phase | cEO | Weekly | Ensure that permanent crossings are developed if there is no alternative. |
| – There must not be any impact on the long term morphological dynamics of watercourses or estuaries; | DPM, cEO | Develop a management plan or process for implementation should a spill take place within a watercourse and ensure continuous monitoring | During the construction and operation phase | ECO, dEO | For all phases of the project life cycle (i.e. construction, operation, decommissioning) | No incidents reported of spillage of pollutants into watercourses |
| – Existing crossing points must be favored over the creation of new crossings (including temporary access) | DPM, cEO | Develop a management plan or process for implementation should a spill take | During the pre-construction and construction phase | ECO, dEO | During the construction phase of the project. | Existing crossing points utilised as opposed to new ones |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|-------------------------------|--------------------|-----------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | place within a watercourse and ensure continuous monitoring | | | | created and no incidents reported of spillage of pollutants into watercourses |
| <p>– When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken:</p> <p>a) Water levels during the period of construction; No altering of the bed, banks, course or characteristics of a watercourse</p> <p>b) During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained;</p> <p>c) 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</p> <p>d) 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.</p> | Contractor | Activities undertaken near watercourses must be in-line with and consider the specified environmental controls | During the construction phase | ECO | Monthly, and as and when required | No degradation of the watercourses and no incidents of destruction reported |

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; | cEO and contractor | Demarcate areas of indigenous vegetation to be avoided before clearance is undertaken | Construction and operation (i.e. for maintenance purposes) | ECO monthly, Operation and maintenance team weekly | Weekly, and as and when required | No unnecessary clearance of indigenous vegetation is undertaken |
| – Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species; | Contractor | Demarcate areas containing protected or endangered species to be avoided by construction activities | During the Construction Phase | ECO monthly and Operation and maintenance team weekly | Weekly, and as and when required | No clearance of protected or endangered species other than those permitted to be removed |
| – 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; | Relevant specialist in consultation with the Contractor | Develop and implement a Plant Search and Rescue Plan | Pre-construction & Construction | cEO | Weekly, and as and when required | Implementation of the Plant Search and Rescue Plan and photographic evidence and notes of the |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|--|--------------------|--|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | implementation of the plan |
| <ul style="list-style-type: none"> 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; | DPM | Undertake the permitting process in order to obtain the relevant permits for the removal of protected species. Permits must be kept on file | Pre-construction | ECO | Once, prior to the commencement of the construction phase and removal of the protected species | CA permits on file |
| <ul style="list-style-type: none"> 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; | ECO | Ensure that the audit report indicates all species rescued and replanted and provides feedback in terms of compliance with the conditions of permits for replanting | During the Construction Phase and following the completion of the Construction Phase | ECO | Once off or as and when required | ECO confirmed rescued and replanted programme implemented correctly. |
| <ul style="list-style-type: none"> Trees felled due to construction must be documented and form part of the Environmental Audit Report; | ECO | Ensure that the audit report documents the details of trees felled | During the Construction Phase and following the completion of the | ECO | Once, prior to the commencement of the construction phase | CA permits on file |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|-------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | Construction Phase | | and removal of the protected species | |
| – Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris; | Contractor | Felled trees, vegetation cuttings and debris must be disposed of at a licensed waste disposal facility | During the Construction Phase | ECO | Monthly | No felled trees, vegetation cuttings and debris are dumped in inappropriate locations and disposal certificates are available as proof of responsible disposal |
| – Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained; | DPM and Contractor | A suitably qualified pest control operator must be appointed | Construction and Operation | ECO | As and when the use of herbicides is required | Only registered pest control operators must be appointed and proof of their registration must be provided |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--|--|-------------------------------|------------------------------------|--|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - A daily register must be kept of all relevant details of herbicide usage; | DPM and Contractor | A suitably qualified pest control operator must be appointed | Construction and Operation | ECO | As and when the use of herbicides is required | Only registered pest control operators must be appointed and proof of their registration must be provided |
| - No herbicides must be used in estuaries | Not Applicable – no estuaries applicable | | | | | |
| - 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. | Contractor in consultation with the cEO | Spatially demarcate protected species and sensitive vegetation and implement appropriate fencing where required as per section 5.3 | During the construction phase | ECO | Once, during the undertaking of the demarcation of the areas and the erection of the fencing | Demarcation and fencing is undertaken in-line with the requirements of section 5.3 |
| - Alien invasive vegetation must be removed and disposed of at a licensed waste management facility. | Contractor | Undertake removal of alien invasive vegetation in accordance with the relevant | Construction and Operation | ECO Operation and maintenance team | Monthly, and as and when required | Proof must be provided that alien invasive vegetation has been cleared in |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---------------------------|--------------------|--|------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | guideline and ensure the vegetation is disposed of at a licensed waste disposal facility | | | | accordance to the relevant guideline and that the vegetation was disposed of at a licensed waste disposal 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; | dEO / cEO Contractor | Develop a procedure for dealing with livestock within the affected properties | Pre-construction and during the construction phase | ECO | Once, prior to the commencement of construction and as and when | Written consent provided by the landowner and proof of representatio |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|--|--|--|--|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | required during the construction phase | n of the landowner during interference |
| – The breeding wild birds species must be taken into consideration during the planning of the development programme; | dEO / cEO in consultation with the Contractor | Ensure that the planning and development programme considers breeding sites for wild bird species | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and as and when required | The planning and development programme includes the consideration of breeding sites for wild bird species |
| – 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; | dEO / cEO in consultation with the Contractor | Avoid breeding sites and ensure that special care is taken in the presence of nestlings and fledglings | During the Construction Phase Operation Phase | ECO monthly, cEO and Operation and maintenance team weekly | Weekly, and as an when required during the construction . Monthly, and as and when required during operation | Photographic record of intact breeding sites |
| – Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds; | dEO / cEO in consultation with the Contractor | All mitigation measures recommended by the avifauna specialist must be implemented | During the Construction Phase Operation Phase | ECO Operation and maintenance team | Monthly during construction and monthly during operation | Photographic record of compliance and successful implementation of the |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|--|-------------------------------|--------------------|-----------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | recommended measures |
| - 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; | dEO / cEO in consultation with the Contractor | All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement. These areas must be demarcated as Access Restricted Areas | During the Construction Phase | ECO | Monthly, and as and when required | No instances of poaching is reported |
| - No deliberate or intentional killing of fauna is allowed; | dEO / cEO in consultation with the Contractor | All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement. These areas must be demarcated as Access Restricted Areas | During the Construction Phase | ECO | Monthly, and as and when required | No instances of deliberate or intentional killing is reported |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|--|--|---------------------------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| <p>– 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</p> | dEO / cEO in consultation with the Contractor | Implement and maintain snake deterrents on pylons in areas where snakes are abundant | During the Construction Phase Operation Phase | ECO Operation and maintenance team | Once, during the construction of the pylons and as and when required. Monthly during operation | Photographic record of the implementation and maintenance of snake deterrents |
| <p>– 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.</p> | DPM in consultation with the dEO | Undertake a permitting process to obtain the required permits | Pre-construction | ECO | Once, prior to the commencement of construction and as and when required | Permits for removal and/relocation must be kept on file and be readily available |

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 ; | DPM and a suitably qualified specialist dEO / cEO in consultation with the Contractor and ECO | Spatially identify and demarcate areas of heritage significance as per the Heritage Impact Assessment and the Heritage Walk-through Report and as per the requirements of section 5.3 | Pre-construction | ECO | Once, prior to the commencement of construction | Proof of avoidance of sensitive heritage features through details of avoidance and photographic records |
| – Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance; | dEO (in consultation with specialists if/as required). | Ensure construction staff are adequately informed (via environmental awareness training) to carry out monitoring of excavations for fossils, artefacts and important heritage material | During the Construction Phase | ECO | Monthly, or as required | Environmental awareness training includes measures relating to monitoring for chance finds |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|--|-------------------------------|--------------------|----------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| <ul style="list-style-type: none"> All work must cease immediately, if any human remains and/or other archaeological, paleontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/ paleontologist (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. | dEO / cEO in consultation with the Contractor and ECO | Develop and implement procedures for situations where human remains, archaeological, palaeontological or historical material are uncovered | During the Construction Phase | ECO | As and when required | Proof of work ceased and the required procedures followed in cases where material is discovered. |

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 |
| <ul style="list-style-type: none"> 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.; | cEO in consultation with the Contractor | Develop an Emergency Preparedness, Response and Fire Management Plan specific to the project | Pre-construction Construction | cEO | Once, prior to the commencement of construction and weekly during the | Compliance with the Emergency Preparedness, Response and Fire Management Plan |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-------------------------------|--------------------|-----------------------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | construction phase | |
| – All unattended open excavations must be adequately fenced or demarcated; | Contractor | Ensure that all excavations undertaken is fenced and demarcated within a reasonable timeframe and in instances where excavations will be open for long-periods of time | During the Construction Phase | cEO | Weekly | Excavations are fenced where required and photographic proof can be provided |
| – Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding; | Contractor | All staff must be easily identifiable and the climbing of towers and scaffolding must only be undertaken by authorised personnel as managed by the Contractor | During the construction phase | ECO | Monthly, and as and when required | No incidents of unauthorised climbing is reported |
| – Ensure structures vulnerable to high winds are secured; | Contractor | Ensure that sufficient stabilisation measures are implemented to | During the construction phase | cEO | Weekly, and as and when required | No incidents of unstable structures due to high |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|-------------------------------|--------------------|-----------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | secure structures vulnerable to high winds | | | | winds is reported |
| – Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged. | cEO | Compile and regularly update as incidents and complaints are submitted from the public and indicate the actions taken to resolve the complaint | During the construction phase | ECO | Monthly, and as and when required | The incidents and complaints register is complete and provides all the required details |

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; | Contractor | Mobile chemical toilets must be placed appropriately and in areas that avoid | During the Construction Phase | cEO | Weekly | Mobile toilets are installed and avoid environmental sensitivities |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|---|--|--------------------------------|--------------------|-----------------------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | environmental sensitivities | | | | |
| <ul style="list-style-type: none"> - 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; | Contractor in consultation with the cEO | All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement. | Pe-construction & Construction | ECO | Monthly, and as and when required | No evidence of non-compliance identified |
| <ul style="list-style-type: none"> - Where mobile chemical toilets are required, the following must be ensured: <ul style="list-style-type: none"> 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; | Contractor in consultation with the cEO | The installation of the toilets by the Contractor must be as per the listed requirements | During the Construction Phase | cEO | Weekly | No evidence of non-compliance identified |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|-------------------------------|--------------------|-----------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - A copy of the waste disposal certificates must be maintained. | Contractor | Certificates obtained from the licensed waste disposal facility with the emptying of the toilets must be kept on file | During the Construction Phase | ECO | Monthly, and as and when required | Certificates for waste disposal from the licensed waste disposal facility available on site |

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; | Contractor | Only environmentally-friendly pest control must be used, when required | During the Construction Phase | ECO | As and when pest control is required for the project | Contractor to provide proof of pest control used being environmentally-friendly |
| - Ensure that the workforce is sensitized to the effects of sexually transmitted diseases, especially HIV AIDS; | cEO / Contractor in | The effects of sexually transmitted | Pre-construction & Construction | ECO | Once, prior to the commence | Environmental awareness training |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|---|---|---------------------------------|--------------------|--|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | consultation with the ECO | diseases and HIV/AIDS must be covered in the Environmental Awareness Training | | | ment of construction and monthly during construction | material requirements checklist |
| – The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area; | Contractor | Develop and place information posters on HIV/AIDS | During the Construction Phase | cEO | Weekly | Photographic evidence of poster placement |
| – Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable; | cEO / Contractor in consultation with the ECO | Information and education of sexually transmitted diseases must be covered in the Environmental Awareness Training. | Pre-construction & Construction | ECO | Monthly | Environmental awareness training material requirements checklist |
| – Free condoms must be made available to all staff on site at central points; | Contractor | Placement of free condoms in mobile toilets and at the construction camps | During the Construction Phase | ECO | Monthly | Proof of placement of free condoms by the contractor to be provided |
| – Medical support must be made available; | dEO / cEO in consultation with the Contractor | Ensure that designated personnel with first aid training are | Construction and Operations | ECO | Monthly | Check the availability of first aid trained |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|-------------------------------|--------------------|-------------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | available on site and that first aid kits to provide medical support is readily available | | | | personnel and medical kits (including if these are complete in terms of supplies) |
| - Provide access to Voluntary HIV Testing and Counselling Services. | Contractor | Compile a HIV testing schedule and provide counselling services where required | During the Construction Phase | ECO | Quarterly, and as and when required | Voluntary testing schedules and proof of counselling (where undertaken) |

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; | Contractor | Develop an Emergency Preparedness, Response and Fire Management Plan specific to the project | Pre-construction | ECO | Once, prior to the commencement of construction | Emergency Preparedness, Response and Fire Management Plan compiled |
| – The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation; | Contractor | Develop an Emergency Preparedness, Response and Fire Management Plan specific to the project which covers accidents, potential spillages and fires | Pre-construction | ECO | Once, prior to the commencement of construction | Emergency Preparedness, Response and Fire Management Plan includes required specifications |
| – All staff must be made aware of emergency procedures as part of environmental awareness training; | CEO / dEO in consultation with the ECO | Develop environmental awareness training material which covers the relevant | Pre-construction | ECO | Prior to the commencement of the environmental | Environmental awareness training material requirements checklist |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|---|------------------------------|--------------------|------------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | emergency procedures | | | awareness training | |
| – The relevant local authority must be made aware of a fire as soon as it starts; | Contractor in consultation with the ECO | Develop and include a procedure in the Emergency Preparedness, Response and Fire Management Plan for the event of a fire and the procedure to be followed for informing the local authority | Construction | ECO | As and when a fire occurs | The local authority was informed as per the relevant procedure set out in the Emergency Preparedness, Response and Fire Management Plan |
| – In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see Hazardous Substances section 5.17). | Contractor | Implement the required mitigation measures in the event of a spill or leak as per the requirements of Section 5.17. | Construction and Operations | ECO | As and when a spill or leak occurs | The mitigation measures included under Section 5.17 have been adhered to |

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; | CEO in consultation with the Contractor | Develop a strategy of how hazardous substances can be and should be minimised | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and monthly during the construction phase | Contractor to provide evidence of substances used for proof of compliance |
| - All hazardous substances must be stored in suitable containers as defined in the Method Statement; | Contractor | Develop a Method Statement for the storage of hazardous substances in suitable containers | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and monthly during the construction phase | Photographic proof that hazardous substances are stored in suitable containers as per the requirements of the relevant Method Statements |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|-------------------------------|--------------------|---------------------------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Containers must be clearly marked to indicate contents, quantities and safety requirements; | Contractor | Where hazardous waste is stored these must be clearly marked indicating the required details of the contents | During the Construction Phase | ECO | Monthly | Photographic proof that containers are marked as per the requirements |
| – All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers; | Contractor | Ensure that storage areas are sufficiently bunded which are of sufficient capacity to contain a spill / leak from the stored containers | During the Construction Phase | ECO | Monthly during the Construction Phase | Photographic proof that storage areas are bunded and proof that the bund areas are of sufficient capacity to contain a spill / leak from the stored containers |
| – Bunded areas to be suitably lined with a SABS approved liner; | Contractor | Ensure that bunded storage areas are suitably lined | During the Construction Phase | ECO | Once, during the Construction Phase | Photographic proof that bunded storage areas are suitably lined |
| – An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis; | cEO / Contractor | Compile and update an Alphabetical Hazardous Chemical | During the Construction Phase | ECO | Monthly, and as and when required | Complete and up to date control sheet provided by |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|---------------------------------|--------------------|--|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | Substance (HCS) control sheet specific to the project | | | | the Contractor |
| – All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS); | cEO / Contractor | Keep a record of all hazardous chemicals and the respective MSDS | During the Construction Phase | ECO | Monthly, and as and when required | Record of hazardous chemicals and the respective MSDS |
| – All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet; | cEO / Contractor | Provide training for personnel working with HCS | Pre-construction | ECO | Once, prior to the commencement of construction and as and when required | Record of training provided to personnel working with HCS |
| – 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; | cEO / Contractor | Develop environmental awareness training material which covers the relevant impacts and safety measures. Provide appropriate training and personal | Pre-construction & Construction | ECO | Prior to the commencement of the environmental awareness training and monthly during the construction phase for personal | Environmental awareness training material requirements checklist and all relevant personnel have undergone appropriate training and have access |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-------------------------------|--------------------|-----------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | protective equipment for the relevant personnel handling hazardous substances and materials | | | protective equipment | to personal protective equipment |
| – The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers; | Contractor | Appropriate storage facilities must be constructed or obtained for the storing of diesel, other liquid fuel, oil and hydraulic fluid | During the Construction Phase | ECO | Monthly, and as and when required | Storage tanks for the project are appropriate and no incidents are reported in this regard |
| – 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); | Contractor | Appropriate storage facilities must be constructed or obtained for tanks as per the requirements listed | During the Construction Phase | ECO | Monthly, and as and when required | Storage areas for the tanks/ bowsers for the project are appropriate and no incidents are reported in this regard |
| – The floor of the bund must be sloped, draining to an oil separator; | Contractor | Appropriate storage facilities must be constructed as per | During the Construction Phase | ECO | Once, during construction | Bunded storage areas are constructed according to |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|-------------------------------|--------------------|-------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | the requirements listed | | | | the requirements |
| – 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; | Contractor | Appropriately constructed refuelling facility must be developed as per the requirements. Drip trays must be provided for use | During the Construction Phase | ECO cEO | Monthly Weekly | Soils at the refuelling facility are protected as required and drip trays are provided and used |
| – All empty externally dirty drums must be stored on a drip tray or within a bunded area; | Contractor | Ensure that empty dirty drums are stored appropriately as per the requirements | During the Construction Phase | ECO cEO | Monthly Weekly | Drip trays or bunded areas are used for the storage of dirty drums |
| – No unauthorised access into the hazardous substances storage areas must be permitted; | Contractor | Ensure through the implementation of procedures that no unauthorised access is undertaken into the storage areas | During the Construction Phase | ECO | Monthly | Proof of the implementation of the relevant procedure must be provided by the contractor |
| – No smoking must be allowed within the vicinity of the hazardous storage areas; | Contractor | Inform all employees of the requirement and develop and place relevant | During the Construction Phase | ECO cEO | Monthly Weekly | Photographic record of the signage placed must be provided |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|-------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | signage in the relevant areas | | | | |
| – Adequate fire-fighting equipment must be made available at all hazardous storage areas; | Contractor | Hazardous storage areas must be fitted with adequate fire-fighting equipment | During the Construction Phase | ECO | Monthly | Adequate fire-fighting equipment is available and has been serviced |
| – 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; | Contractor | Provide a mobile refuelling unit as well as suitable ground protection, where required | During the Construction Phase | ECO | Monthly, and as and when required | A mobile refuelling unit and suitable ground protection is available for use |
| – 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; | Contractor | Provide an appropriate spill kit for the project for the use of hazardous substances | During the Construction Phase | ECO | Monthly, and as and when required | Appropriate spill kits are available for use |
| – The responsible operator must have the required training to make use of the spill kit in emergency situations; | cEO and Contractor | Provide training on the use of spill kits to the relevant employees | Pre-construction | ECO | Once, prior to the commencement of construction | Proof of training to be provided by the contractor |
| – An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken; | cEO and Contractor | Provide an appropriate number of spill kits in relevant areas | During the Construction Phase | ECO | Monthly | Proof of appropriate number of spill kits in |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|-------------------------------|--------------------|-----------------------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | appropriate areas to be provided by the contractor |
| <p>– In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to Section 5.7 for procedures concerning storm and waste water management and 5.8 for solid and hazardous waste management.</p> | cEO and Contractor | Storage and disposal of contaminated soil must be in accordance with the National Environmental Management: Waste Act and sections 5.7 and 5.8 of this EMPr | During the Construction Phase | ECO | Monthly, and as and when required | <p>Proof of storage and disposal in terms of the National Environmental Management: Waste Act must be provided.</p> <p>Certificates of disposal at licensed waste disposal facilities must be provided</p> |

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; | Contractor | Demarcate specific areas for the maintenance of vehicles and equipment | During the Construction Phase | ECO | Monthly | A dedicated area for the maintenance of vehicles and machinery is used. |
| – 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; | Contractor | Ensure that a drip tray is available for any emergency repairs required | During the Construction Phase | ECO | Monthly | Contractor to provide evidence of drip tray use for emergency repairs |
| – Leaking equipment must be repaired immediately or be removed from site to facilitate repair; | Contractor | Ensure that where leaking equipment is identified it is repaired immediately or removed from site for repairs | During the Construction Phase | ECO | Monthly | Contractor to provide details of equipment repaired or removed from site |
| – Workshop areas must be monitored for oil and fuel spills; | cEO | Undertake regular inspections of the workshop areas for oil and fuel spills | During the Construction Phase | ECO | Monthly | Register of inspection |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-------------------------------|--------------------|--|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | and keep an updated register of inspection on site | | | | |
| – Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available; | Contractor | Provide an appropriate spill kit for the project | During the Construction Phase | ECO | Monthly, and as and when required | Appropriate spill kits are available for use |
| – 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; | Contractor | Ensure that the workshop area is sufficiently bunded in accordance with the required specification | During the Construction Phase | ECO | Once, during the Construction Phase and as and when required | Workshop area is bunded in accordance with the required specification |
| – Water drainage from the workshop must be contained and managed in accordance Section 5.7: Storm and waste water management. | Contractor | Ensure that water drainage from workshop area is managed as per the requirements of section 5.7 | During the Construction Phase | ECO | Monthly | Workshop drainage is managed in accordance with the requirements |

5.19 Batching plants

Impact management outcome: Minimise spillages and contamination of soil, surface water and groundwater.

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - Concrete mixing must be carried out on an impermeable surface; | Contractor | Provide impermeable surface for the mixing of concrete | During the Construction Phase | cEO | Weekly | No concrete mixing is undertaken on open ground |
| - Batching plants areas must be fitted with a containment facility for the collection of cement laden water. | Contractor | Implement measures for the control and management of cement laden water | During the construction phase | cEO | Weekly | No mismanagement of laden water due to the temporary concrete batching plant |
| - Dirty water from the batching plant must be contained to prevent soil and groundwater contamination | Contractor | Implement measures for the control and management of dirty water to prevent soil and groundwater contamination | During the construction phase | cEO | Weekly | No mismanagement of dirty water due to the temporary concrete batching plant and no/minimal soil and |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|-------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | groundwater contamination |
| – Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains; | Contractor | Demarcate and provide a storage area for bagged cement in-line with the listed requirements | During the Construction Phase | cEO | Weekly | Photographic proof of bagged cement stored within the demarcated area |
| – A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted; | Contractor | Provide a washout facility for the washing of associated equipment. Enforce limitations on water use for washing of equipment | During the Construction Phase | cEO | Weekly | No cement laden water is released into the environment. Only minimal water is used for washing |
| – Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licensed disposal facility; | Contractor | Make use of hardened concrete where possible or dispose of concrete in a suitable manner | During the Construction Phase | ECO | Monthly | Certificates of disposal of concrete at licensed waste disposal facility |
| – Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site; | Contractor | Bind empty cement bags and temporarily store it | During the Construction Phase | ECO | Monthly | Proof of binding of empty cement bags |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|---|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | in an appropriate area on site | | | | and storage in an appropriate area on site to be provided by the Contractor |
| – Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to Section 5.20: Dust emissions) | Contractor | Ensure that sand and aggregates are kept damp or otherwise protected from dust generation | During the Construction Phase | ECO | Monthly | Proof of damping (or alternative dust suppression) of sand and aggregates must be provided by the Contractor |
| – 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; | Contractor | Ensure that all excess sand, stone and cement is removed or reused | At the completion of the Construction Phase | ECO | Once, with the completion of construction | Certificates for the disposal of sand, stone and cement at licensed waste disposal facilities or proof of reuse must be provided |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--------------------------|-------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Temporary fencing must be erected around batching plants in accordance with Section 5.5: Fencing and gate installation. | Contractor | Erect Temporary fencing | During the construction phase | cEO | Weekly | Temporary fencing around batching plants |

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; | Contractor | Apply appropriate dust suppressant | During the Construction Phase | cEO | Weekly | Contractor to provide proof of use of appropriate dust suppressants |
| – 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; | Contractor | Proper planning for vegetation removal must be undertaken as well as for the | During the Construction Phase and Rehabilitation | cEO | Weekly | Plan for implementation must be provided by the Contractor |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|---|-------------------------------|--------------------|--|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | associated rehabilitation | | | | |
| – Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present; | Contractor | Ensure that specific limitations are placed on the transport and handling of erodible materials during high wind conditions or when a visible dust plume is present | During the Construction Phase | cEO | Bi-weekly (every second week) | No complaints submitted in this regard |
| – 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; | ECO | ECO to provide adequate recommendations | During the Construction Phase | Not Applicable | | |
| – Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind; | Contractor | Place soil stockpiles in areas less affected by wind | During the Construction Phase | cEO and ECO | Bi-weekly (every second week) Monthly | Soil stockpiles are not exposed to wind and have not been eroded |
| – Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO; | Contractor in consultation with the ECO | Contractor to implement erosion control measures as recommended and agreed with the ECO | During the Construction Phase | cEO | Weekly, until erosion is no longer a problem | Recommendations made by the ECO have been implemented |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|------------------------|---|--|---------------------------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | by the Contractor |
| – Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas; | cEO / dEO / contractor | Inform all drivers of speed limits and place appropriate signage along the relevant roads | During the Construction Phase Operation Phase | ECO Operation and Maintenance team | Monthly | No complaints from community members are submitted |
| – Straw stabilisation must be applied at a rate of one bale/10 m ² and harrowed into the top 100 mm of top material, for all completed earthworks; | Contractor | Ensure that straw stabilisation is undertaken as per the listed requirements | During the Construction Phase | ECO | Monthly | Photographic record of all straw stabilisation undertaken |
| – For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust. | Contractor | Appropriate dust suppressant measures are implemented | During the Construction Phase | cEO | Weekly | Photographic record of measures being implemented and the results thereof |

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 | cEO / dEO / contractor | Ensure the contractor is suitably licensed with all necessary credentials and certifications | Pre-Construction Phase | ECO/EO | Once off, before blasting activities commence . | ECO/EO to check all valid credentials and certifications on hand. |
| - Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site. | cEO / dEO / contractor | Ensure all responsible personnel and landowners have been notified of blasting activities 24 hours in advance and keep records of notifications. | Pre-Construction Phase | ECO/EO | Once off, before blasting activities commence . | ECO/EO to confirm all necessary personnel and landowners have been notified. Notification records to be provided. |

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; | Contractor | Ensure that noise limits do not exceed acceptable limits and avoid the use of amplification communication | During the Construction Phase | ECO | Monthly, and as and when required | No complaints registered in this regard. No amplification equipment is used. |
| – All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained; | Contractor | Provide and implement silencing technology | During the Construction Phase | ECO | Monthly, and as and when required | No complaints registered in this regard. Silencing technology is utilised. |
| – Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers; | cEO | Update complaints register. Provide daily transport to and from site for employees | During the Construction Phase | ECO | Monthly, and as and when required | Complaints register provided by the cEO and proof of transportation services provided |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|---|--|-----------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – 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. | cEO and Contractor in consultation with the ECO | Compile a Code of Conduct for staff. Appropriate operating hours must be identified for the project. | Pre-construction and Construction | ECO | Once, prior to the commencement of construction | No complaints registered in this regard. |

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; | cEO / Contractor | Identify and demarcate through signage designated smoking areas | Pre-construction & Construction | ECO | Monthly | Photographic record of designated smoking area |
| – Firefighting equipment must be available on all vehicles located on site; | cEO / dEO in consultation with the Contractor | Provide all vehicles with firefighting equipment | Construction | ECO | Monthly | All vehicles are fitted with firefighting equipment and the details |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|---|--|---------------------------------|--------------------|--|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | thereof are provided by the cEO |
| – The local Fire Protection Agency (FPA) must be informed of construction activities; | cEO in consultation with the ECO | Undertake formal consultation to inform the local FPA of the associated construction activities | Pre-construction | ECO | Once, during the commencement of the Construction Phase | Proof of consultation with the FPA |
| – Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site; | dEO / cEO / Contractor in consultation with the ECO | Develop environmental awareness training material which covers the contact numbers for the FPA and emergency services. Place the contact numbers for the FPA and emergency services at a visible and central location | Pre-construction & Construction | ECO | Prior to the commencement of the environmental awareness training and once during the construction phase | Environmental awareness training material requirements checklist and photographic record of contact numbers on display |
| – Two way swop of contact details between ECO and FPA. | ECO | Consultation between the ECO and FPA in order to | Pre-construction | Not Applicable | | |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---------------------------|--------------------|--------------------------|------------------------------|--------------------|-----------|------------------------|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | exchange contact details | | | | |

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; | Contractor | Identify and demarcate an appropriate location for the storage of excavated materials | Pre-construction & Construction | ECO | Monthly | Excavated material is not stored within sensitive environmental areas |
| – All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods; | Contractor | Implement appropriate and sufficient maintenance on | During the Construction Phase | cEO ECO | Bi-weekly (every second month) | Stockpiled material is maintained sufficiently and is clear of |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|-------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | stockpiled material regularly | | | Monthly | weeds and alien vegetation |
| - Topsoil stockpiles must not exceed 2 m in height; | Contractor | Enforce limitations for the height of topsoil stockpiles | During the Construction Phase | cEO ECO | Bi-weekly (every second month) Monthly | Topsoil stockpiles do not exceed 2m in height |
| - During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.); | Contractor | Appropriate material must be provided in order to cover stockpiles when required | During the Construction Phase | ECO | Monthly | Contractor to provide proof of availability of appropriate material to cover stockpiles when required |
| - Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material. | Contractor | Sandbags must be provided in order to prevent erosion of stockpiled materials | During the Construction Phase | ECO | Monthly | Contractor to provide proof of availability of sandbags to prevent erosion of stockpiled materials |

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; | Contractor | Collection and safe storage of topsoil for later use in rehabilitation phase | During the Construction Phase | ECO | Monthly | Visual inspection of topsoil stockpiles for later use |
| – Areas to be rehabilitated include terrace embankments and areas outside the high voltage yards; | Contractor | Regard areas that do not house infrastructure as requiring rehabilitation and apply rehabilitation measures to these regions | During the Construction Phase, where the area is no longer going to be utilised | ECO | Monthly | Visual inspection of rehabilitation implementation to ensure these areas are being rehabilitated |
| – Where required, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; | Contractor | If required stabilise soil using recognised methods to ensure proper rehabilitation and erosion control | Duration of the construction phase | ECO | Monthly | Visual inspection of stabilised soil regions and descriptions of staff of stabilisation method used |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|------------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – 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; | Contractor | If required stabilise soil using recognised methods to ensure proper rehabilitation and erosion control | Duration of the construction phase | ECO | Monthly | Visual inspection of stabilised soil regions and descriptions of staff of stabilisation method used |
| – Rehabilitation of the disturbed areas must be managed in accordance with Section 5.35: Landscaping and rehabilitation ; | Contractor | Review and ensure that all rehabilitation measures are implemented in accordance with the requirements of Section 5.35 | Duration of the construction phase | ECO | Monthly | Visual inspection of rehabilitation conducted and the degree of conformance with the requirements set out in Section 35.5 of this report |
| – All excess spoil generated during terracing activities must be disposed of in an appropriate manner and at a recognised landfill site; and | Contractor | Dispose of all excess spoil using appropriate means and at recognised landfill sites. Keep written registers of the disposal conducted | Duration of the construction phase | ECO | Monthly | Evidence of disposal slips as applicable kept in the site environmental file |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|------------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes. | Contractor | Where spoil is utilised for landscaping purposes implement a 150mm topsoil layer on top following shaping and compaction to promote rehabilitation | Duration of the construction phase | ECO | Monthly | Spoil material used in landscaping is suitably covered with a later of topsoil at least 150mm deep |

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; | Contractor | Use a licensed waste disposal facility for the disposal of excess spoil | During the Construction Phase | ECO | Monthly | Certificates obtained for the disposal of excess spoil at a licensed waste |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|---------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | disposal facility |
| – Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes; | Contractor | Spoil used for landscaping must be applied as per the listed requirements | Construction and Rehabilitation | ECO | Monthly | Photographic record of spoil used for landscaping purposes as well as feedback from the contractor |
| – Management of equipment for excavation purposes must be undertaken in accordance with Section 5.18: Workshop, equipment maintenance and storage ; and | Contractor | Undertake the management of equipment for excavation as per the requirements of section 5.18 | During the Construction Phase | ECO | Monthly | Management of equipment is undertaken in line with the requirements of section 5.18 |
| – Hazardous substances spills from equipment must be managed in accordance with Section 5.17: Hazardous substances . | Contractor | Undertake the management of hazardous substances spills from equipment as per the requirements of section 5.17 | During the Construction Phase | ECO | Monthly | Management of hazardous substances spills from equipment is undertaken in line with the requirements |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---------------------------|--------------------|--------------------------|------------------------------|--------------------|-----------|------------------------|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | of section 5.17 |

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 | Contractor | Ensure correct batching of cement | During the construction phase | cEO | Weekly | Measures in place to ensure the batching of cement is done in accordance with Section 5.19: Batching plants |
| – Residual solid waste must be disposed of in accordance with Section 5.8: Solid waste and hazardous management . | Contractor | Undertake the disposal of residual solid waste as per the requirements of section 5.8 | During the Construction Phase | ECO | Monthly | The disposal of residual solid waste is undertaken in line with section 5.8. |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---------------------------|--------------------|--------------------------|------------------------------|--------------------|-----------|------------------------|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | |

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; | Contractor | Review and implement dust management actions in accordance with the requirement of Section 5.20 of this report | During the Construction Phase | ECO | Monthly | Dust management actions observed to be in accordance with the requirement of Section 5.20 of this report |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|-------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Management of equipment used for installation must be conducted in accordance with Section 5.18: Workshop, equipment maintenance and storage; | Contractor | Review and implement equipment management actions in accordance with the requirement of Section 5.18 of this report | During the Construction Phase | ECO | Monthly | Equipment management actions observed to be in accordance with the requirement of Section 18 of this report |
| – Management hazardous substances and any associated spills must be conducted in accordance with Section 5.17: Hazardous substances; and | Contractor | Review and implement hazardous substances and any associated spills in accordance with the requirement of Section 5.17 of this report | During the Construction Phase | ECO | Monthly | Hazardous substances and any associated spills management actions observed to be in accordance with the requirement of Section 5.17 of this report |
| – Residual solid waste must be recycled or disposed of in accordance with Section 5.8: Solid waste and hazardous management. | Contractor | Review and dispose/recycle residual solid waste in accordance with | During the Construction Phase | ECO | Monthly | Dispose/recycle residual solid waste observed to be in |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---------------------------|--------------------|---|------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | the requirement of Section 5.8 of this report | | | | accordance with the requirement of Section 5.8 of this report |

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 | Contractor | Conduct an inspection of the site once assembly is complete to remove all stray bolts or unused materials that may be left on site | Duration of the construction phase | ECO | Monthly | Evidence of leftover waste/unused materials on site following closure of assembly |
| – 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. | Contractor | Review and conduct all emergency repairs in accordance with | Duration of the construction phase | ECO | Monthly | Evidence of emergency repairs carried out |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---------------------------|--------------------|---------------------------------------|------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | Sections 5.18 and 5.16 of this report | | | | having been conducted in accordance with Sections 5.18 and 5.16 of this report |

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; | Contractor | Undertake recycling or disposal of solid waste as per the requirements of section 6.8 | During the Construction Phase | ECO | Monthly | Undertake recycling or disposal of solid waste as per the requirements of section 6.8 |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|-------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Management of equipment used for installation shall be conducted in accordance with Section 5.18: Workshop, equipment maintenance and storage; | Contractor | Undertake the management of equipment as per the requirements of section 5.18 | During the Construction Phase | ECO | Monthly | Management of equipment is undertaken in line with the requirements of section 5.18 |
| – Management hazardous substances and any associated spills shall be conducted in accordance with Section 5.17: Hazardous substances. | Contractor | Undertake the management of hazardous substances as per the requirements of section 5.17 | During the Construction Phase | ECO | Monthly | Management of hazardous substances is undertaken in line with the requirements of section 5.17 |

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. | Contractor | Undertake recycling or disposal of solid waste as per the requirements of section 5.8 | During the Construction Phase | ECO | Monthly | Undertake recycling or disposal of solid waste as per the requirements of section 5.8 |

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; | dEO / cEO | Identify and implement appropriate strategies for communication with the | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and | Communication is undertaken as per the identified strategies |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|---------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | communities through consideration of the community needs | | | monthly during the construction | and no complaints are submitted regarding communication |
| – Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process; | Contractor | Development and implement a Grievance Mechanism which considers the community needs and provides procedures for conflict resolution | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and monthly during the construction phase | Conflict resolution is undertaken in line with the requirements of the Grievance Mechanism. No complaints on conflict resolution is submitted by the community |
| – Sustain continuous communication and liaison with neighboring owners and residents | Contractor | Development and implement and Grievance Mechanism provides procedures for communication / liaison with neighbouring | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and monthly during the construction phase | Communication / liaison with neighbouring landowners and residents are undertaken in line with the requirements |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|---------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | landowners and residents | | | | of the Grievance Mechanism. No complaints on communication with neighbouring landowners and residents are submitted |
| - Create work and training opportunities for local stakeholders; and | Contractor | Develop and implement a "locals first" policy for the provision of employment opportunities | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and monthly during the construction phase | The "locals first" policy is considered in terms of the employment and training opportunities |
| - 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. | Contractor | Ensure no workers are permitted to stay over night on the site | Construction | ECO | Throughout construction | No workers remaining on site over night |

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 ; | Contractor | Regular emptying of the bunds must be undertaken. This must be undertaken as per the requirements listed in sections 5.17 and 5.18 | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Bunds are emptied as per the requirements listed under sections 5.17 and 5.18 |
| – Hazardous storage areas must be well ventilated; | Contractor | Install appropriate ventilation in all hazardous storage areas | During the construction phase | ECO | Prior to site closure for more than 05 days | Effective ventilation is installed in hazardous storage areas |
| – Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service; | Contractor / cEO | Ensure fire extinguishers are serviced, as required and are easily accessible with appropriate signage indicating location. Ensure service records and kept up to date and filed | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Signage placed indicating location of fire extinguishers and service records |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|--|---------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - Emergency and contact details displayed must be displayed; | Contractor / cEO | Place emergency and contact details which are readily available and easily accessible | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Photographic proof of contact details on display |
| - Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel; | Contractor in consultation with the ECO | Hold a workshop with all security personnel to provide a brief of the project and security requirements. Provide facilities in order to contact management and emergency personnel | Pre-construction & construction | ECO | Prior to site closure for more than 05 days | Proof of the workshop held must be kept on file by the contractor. |
| - Night hazards such as reflectors, lighting, traffic signage etc. must have been checked; | Contractor | Regular checks of night hazards must be undertaken | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Proof of checks of night hazards must be provided by the contractor |
| - Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.; | cEO / Contractor in consultation with the ECO | Identify any potential fire hazards and notify the relevant local authority | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Proof of notification of the fire hazards to the local authority |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|-------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | must be provided by the Contractor |
| – Structures vulnerable to high winds must be secured; | Contractor | Ensure structures vulnerable to wind are secure prior to site closure | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Structures vulnerable to wind are secured prior to site closure |
| – Wind and dust mitigation must be implemented; | Contractor | Implement wind and dust mitigation prior to site closure | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Wind and dust mitigation is implemented prior to site closure |
| – Cement and materials stores must have been secured; | Contractor | Ensure cement and material stores are secured prior to site closure | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Cement and material stores are secured prior to site closure |
| – Toilets must have been emptied and secured; | Contractor | Ensure toilets are emptied and secured prior to site closure | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Toilets are emptied and secured prior to site closure |
| – Refuse bins must have been emptied and secured; | Contractor | Ensure refuse bins are emptied and secured prior to site closure | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Refuse bins are emptied and secured prior to site closure |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|-------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - Drip trays must have been emptied and secured. | Contractor | Ensure drip trays are emptied and secured prior to site closure | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Drip trays are emptied and secured prior to site closure |

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 | Contractor | Ensure old equipment is secured and where required, stored in contained areas where no spillage or pollution may result | During the Construction Phase | ECO | Monthly | Drip trays are emptied and secured prior to site closure |
| - Oil containing equipment must be stored to prevent leaking or be stored on drip trays; | Contractor | Ensure old equipment is secured and where required, stored in | During the Construction Phase | ECO | Monthly | Drip trays are emptied and secured prior to site closure |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|-------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | contained areas where no spillage or pollution may result | | | | |
| – All scrap steel must be stacked neatly and any disused and broken insulators must be stored in containers; | Contractor | Store defunct insulators in containers and scrap steel in one single place, neatly secured | During the Construction Phase | ECO | Monthly | Where needed, insulators observed to be stored in containers and scrap stored neatly as determined by the ECO |
| – 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; | Contractor , cEO | Ensure dismantling and packaging of scrapped material is transported in such a way as to prevent spillage and pollution of the environment; | During the Construction Phase | ECO | Monthly | Where needed, insulators observed to be stored in containers and scrap stored neatly as determined by the ECO |
| – The Contractor must also be equipped to contain and clean up any pollution causing spills; and | cEO and Contractor | Provide training on the use of spill kits to the relevant employees | During the Construction Phase | ECO | Monthly | Proof of training to be provided by the contractor |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|-------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Disposal of unusable material must be at a licensed waste disposal site. | cEO and Contractor | Ensure a registered waste disposal site is utilised and keep disposal slips and record in the site environmental file | During the Construction Phase | ECO | Monthly | Visual inspection of disposal record documentation and registration of the waste disposal site utilised. |

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; | Contractor | Develop and implement a rehabilitation plan for the rehabilitation of all disturbed areas. | Pre-construction & Rehabilitation | cEO | Weekly | Rehabilitation of the disturbed areas is undertaken as per the rehabilitation |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|---|---|------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | Dispose of all spoil and waste at a licensed waste disposal facility | | | | plan. All certificates of waste disposal at licensed facilities are available. |
| – 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 | Contractor in consultation with the ECO | Assess all slopes and determine whether contouring is required | Rehabilitation | cEO | Weekly | All slopes are assessed and contoured as required |
| – 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; | Contractor in consultation with the ECO | Assess all slopes and determine whether terracing is required | Rehabilitation | cEO | Weekly | All slopes are assessed and terraced as required |
| – 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; | Contractor | Ensure all berms have a slope of 1:4 and is replanted with indigenous species and grasses | Rehabilitation | cEO | Weekly | All berms have a slope of 1:4 and is replanted with indigenous species and grasses |
| – 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; | Not applicable | | | | | |
| – Rehabilitation of access roads outside of farmland; | Not applicable | | | | | |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Indigenous species must be used for with species and/grasses to where it compliments or approximates the original condition; | Contractor | Make use of indigenous species for rehabilitation | Rehabilitation | cEO | Weekly | Indigenous species are used for rehabilitation |
| – Stockpiled topsoil must be used for rehabilitation (refer to Section 5.24: Stockpiling and stockpiled areas); | Contractor | Ensure stockpiled topsoil is used as per the requirements listed under section 5.24 | Rehabilitation | cEO | Weekly | Stockpiled topsoil is used as per the requirements listed under section 5.24 |
| – Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion; | Contractor | Ensure that topsoil is spread evenly | Rehabilitation | cEO | Weekly | Topsoil is spread evenly |
| – Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed; | Contractor | Remove all visible weeds from placement area and topsoil before spreading the topsoil | Rehabilitation | cEO | Weekly | No weeds are visible in the placement area or the topsoil |
| – Subsoil must be ripped before topsoil is placed; | Contractor | Undertake the ripping of subsoil prior to the spreading of topsoil | Rehabilitation | cEO | Weekly | Subsoil is ripped before topsoil is placed |
| – The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment; | Contractor | Plan the timeframe for rehabilitation in order to undertake vegetation planting during the optimal time for | Rehabilitation | ECO | At the start of rehabilitation to confirm correct timeframe | Rehabilitation is undertaken during the optimal time |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|---|---|-----------------------------------|--------------------|----------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | vegetation establishment | | | | |
| – Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; | Contractor | All disturbed slope areas must be stabilised | Rehabilitation | cEO | Weekly | Disturbed slopes are stabilised sufficiently |
| – 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; | Contractor | Stabilise slopes as per the design specifications | Pre-construction & Rehabilitation | cEO | Weekly | Slopes are stabilised as per the design specifications |
| – Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil. | Contractor | Spoil used for landscaping must be applied as per the listed requirements | Rehabilitation | cEO | Weekly | Photographic record of spoil used for landscaping purposes as well as feedback from the contractor |
| – 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; | Contractor in consultation with a suitably qualified specialist | Make use of a suitable vegetation seed mixture should enhancement be required | Rehabilitation | ECO | As and when required | Use of a suitable vegetation seed mixture if required |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--------------------------|------------------------------|--------------------|-----------|------------------------|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| e) The final product must not cause an ecological imbalance in the area | | | | | | |

6 ACCESS TO THE EMPr

Once completed and signed, to allow the public access to the 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.

PART B: SECTION 2

7 SITE SPECIFIC INFORMATION AND DECLARATION

7.1 Sub-section 1: contact details and description of the project

7.1.1 Details of the applicant:

Name of applicant: Freegold Harmony (Pty) Ltd

Contact person: Thomas Wilson

Tel No: 072 424 9045

Postal Address: P O Box 2, Randfontein, 1760 Johannesburg, South Africa

Physical Address: Randfontein Office Park, Cnr Main Reef Road and Ward Avenue, Randfontein, 1759.

7.1.2 Details and expertise of the EAP:

Name of EAP: Jo-Anne Thomas

Tel No: 011 656 3237

Fax No: 086 684 0547

E-mail address: joanne@savannahsa.com

Expertise of the EAP (Curriculum Vitae included): Refer to Appendix 2 of this EMPr for a CV of the EAP

7.1.3 Project name: 18MW Harmony Joel Solar PV Facility, Free State Province

7.1.4 Description of the project:

Freegold Harmony (Pty) (a subsidiary of Harmony Gold Mining Company Ltd) is looking to supplement its energy supply by implementing photovoltaic (PV) generation at their Mine site, aiding their transition to a more sustainable and environmentally friendly energy mix at the existing Harmony Joel Mine. A solar PV facility with a generating capacity of 18MW is proposed in close proximity to the Harmony Joel mining operations. The site is located 900m north east of the Harmony Joel operations, approximately ~20km north east of the town of Theunissen within the Masilonyana Local Municipality and within the Lejweleputswa District Municipality, Free State Province.

The solar PV facility, known as Harmony Joel Solar PV Facility, will comprise of several arrays of PV panels and associated infrastructure. The project site is located on Portion 0 of the Farm Leeuwbult 580, which are owned by the Mine but outside of the mining area (the project would not impact on mining activities).

A project site considered to be technically suitable for the development of the solar PV facility, with an extent of approximately 1000ha, was identified by Freegold Harmony (Pty) Ltd. A development area of ~220ha was demarcated within the project site for the construction and operation of the Harmony Joel Solar PV Facility and its associated infrastructure, and the full extent of this development area is assessed within this EIA Report. The development area

allows an adequate footprint (~47ha) for the installation of a solar PV facility with a contracted capacity of up to 18MW, while allowing for the avoidance of environmental site sensitivities.

The grid connection for the facility will consist of underground cabling within the facility, an on-site facility substation and switching station to be connected to the existing Shafts 1 & 2 HJ Joel Mining Substation via a power line (located ~830m south west of the development footprint). The grid connection infrastructure is located within an assessment corridor of 300m wide and traverses Portion 0 of the Farm Leeuwbult 580.

The Harmony Joel Solar PV Facility will have a contracted capacity of up to 18MW and will include specific infrastructure, namely:

- » PV modules and mounting structures
- » Inverters and transformers a SCADA room, and maintenance room
- » Cabling between the project components, to be laid underground where practical
- » Access roads, internal roads and fencing around the development area.
- » Temporary and permanent laydown areas and O&M buildings.
- » Grid connection solution including an on-site facility substation, switching station, to be connected to the Shafts 1 & 2 HJ Joel Mining Substation via an overhead power line (located ~830m south west of the development footprint).

7.2 Sub-section 2: Development footprint site map

This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout. The sensitivity map must be prepared from the national web based environmental screening tool, when available for compulsory use at: <https://screening.environment.gov.zg/screeningtool>. The sensitivity map shall identify the nature of each sensitive feature e.g. threatened plant species, archaeological site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features within 50 m from the development footprint.

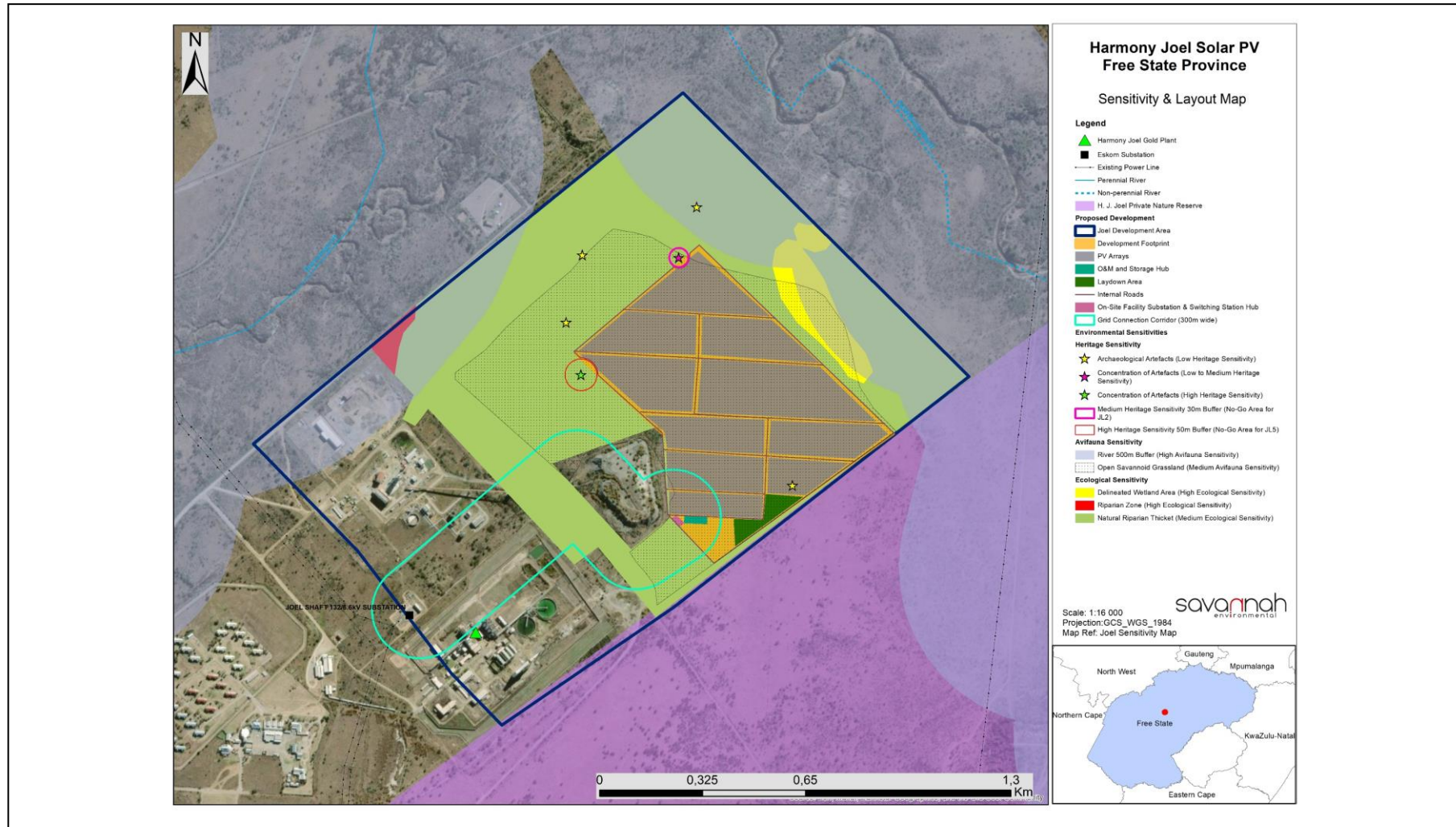


Figure 1: Layout and sensitivity map of the development footprint and grid connection corridor for the 18MW Harmony Joel Solar PV Facility, as was assessed as part of the BA process

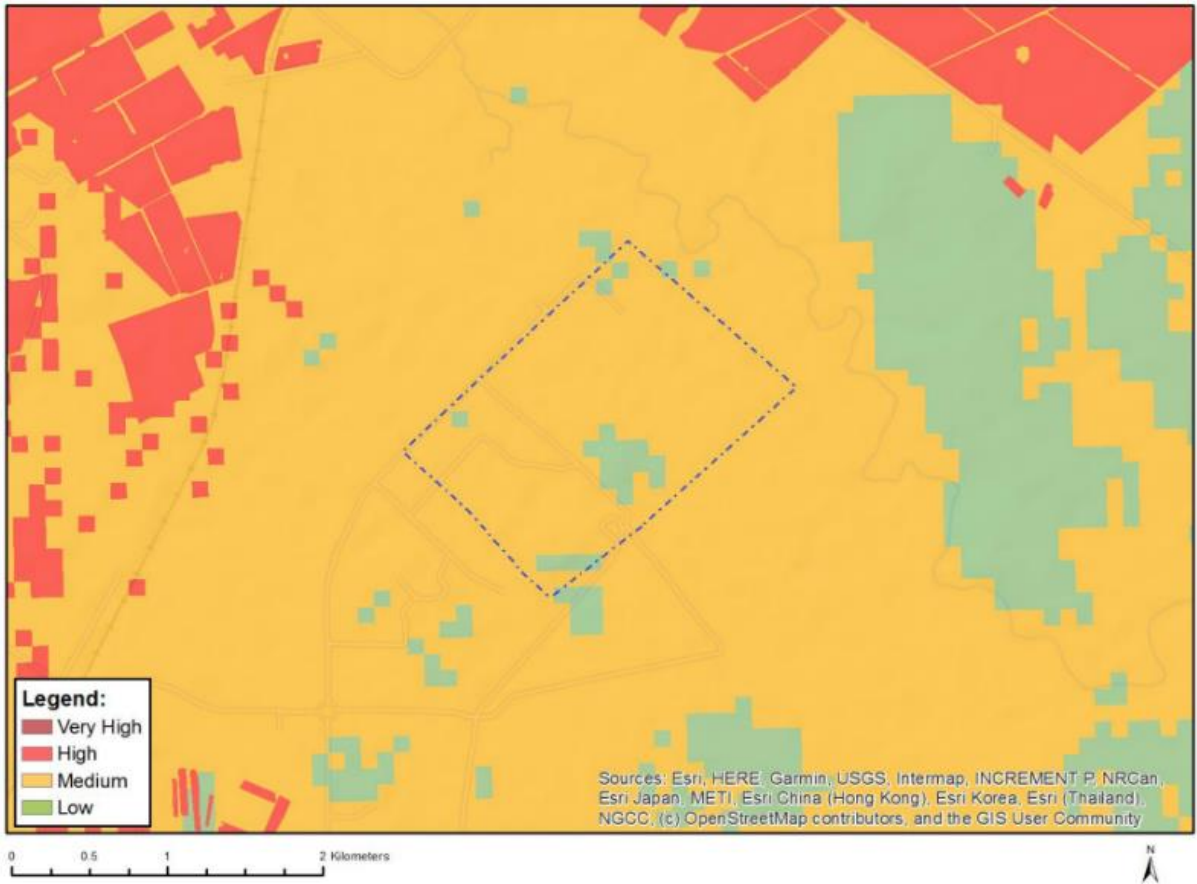


Figure 2: Map of relative agriculture theme sensitivity

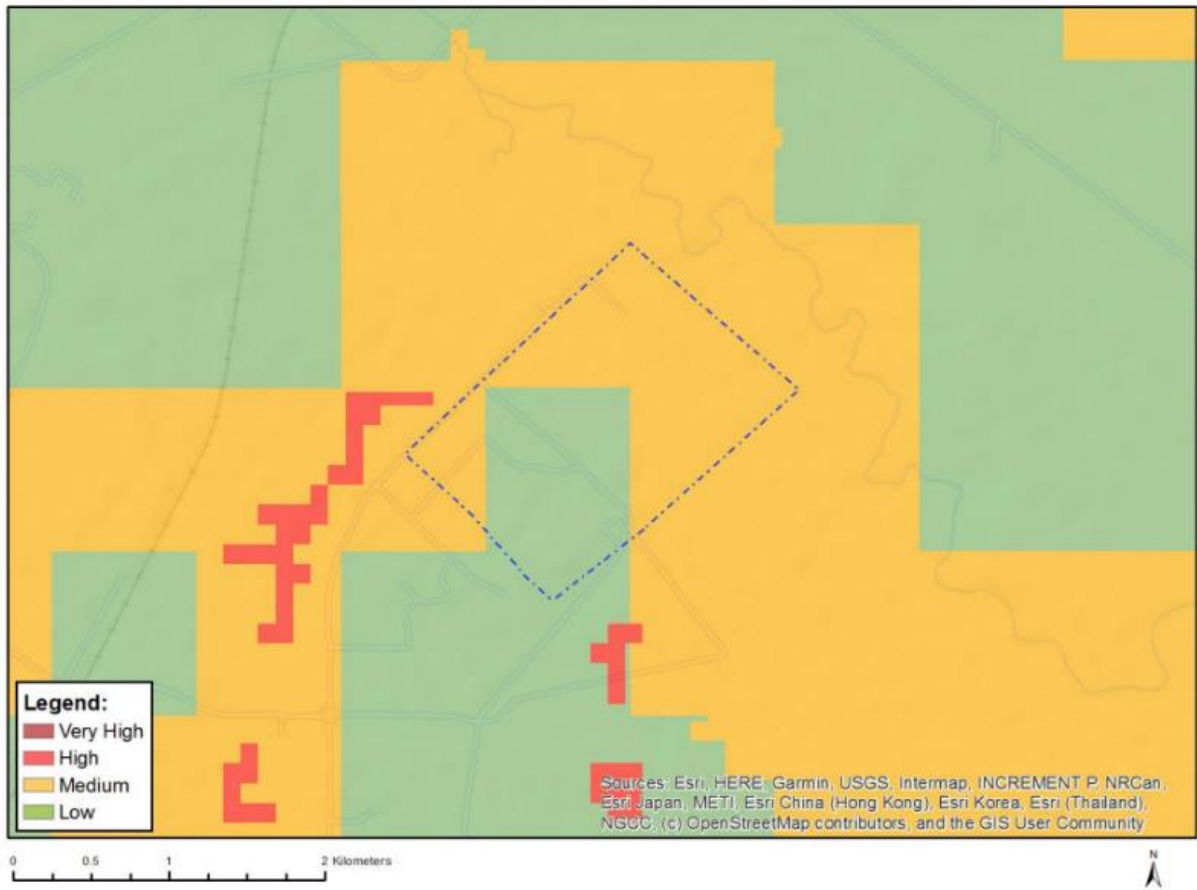


Figure 3: Map of relative animal species theme sensitivity



Figure 4: Map of relative aquatic biodiversity theme sensitivity



Figure 5: Map of relative archaeological and cultural heritage theme sensitivity.



Figure 6: Map of relative avian theme sensitivity

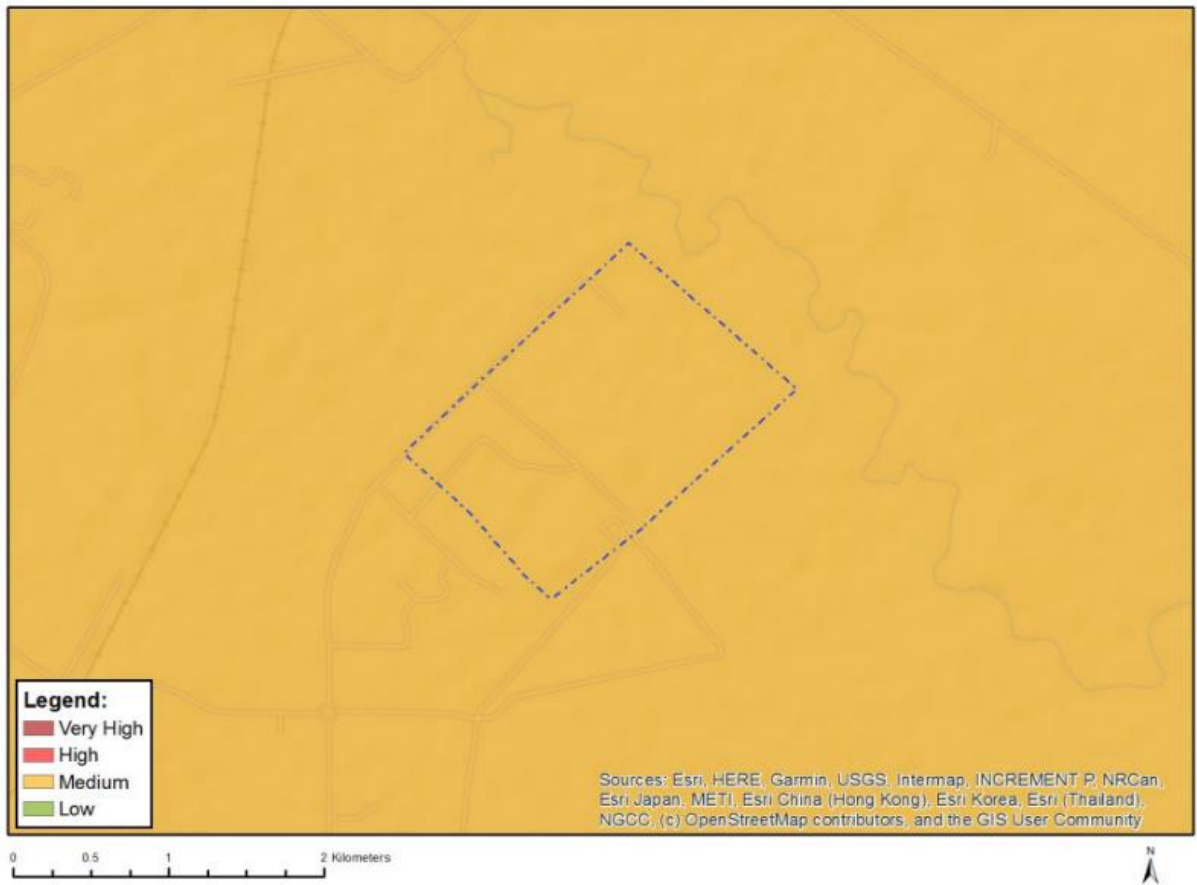


Figure 7: Map of relative civil aviation theme sensitivity



Figure 8: Map of relative defence theme sensitivity

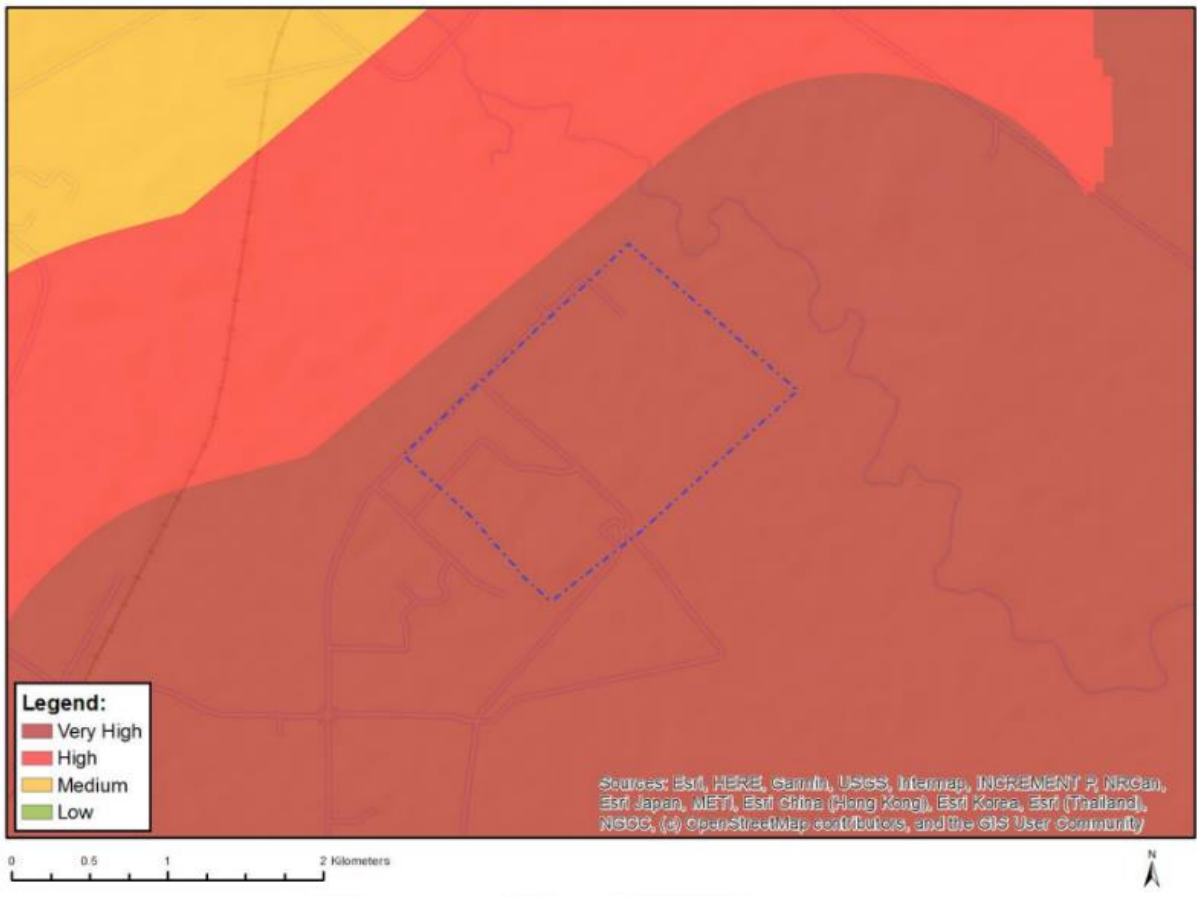


Figure 9: Map of relative landscape (solar) theme sensitivity

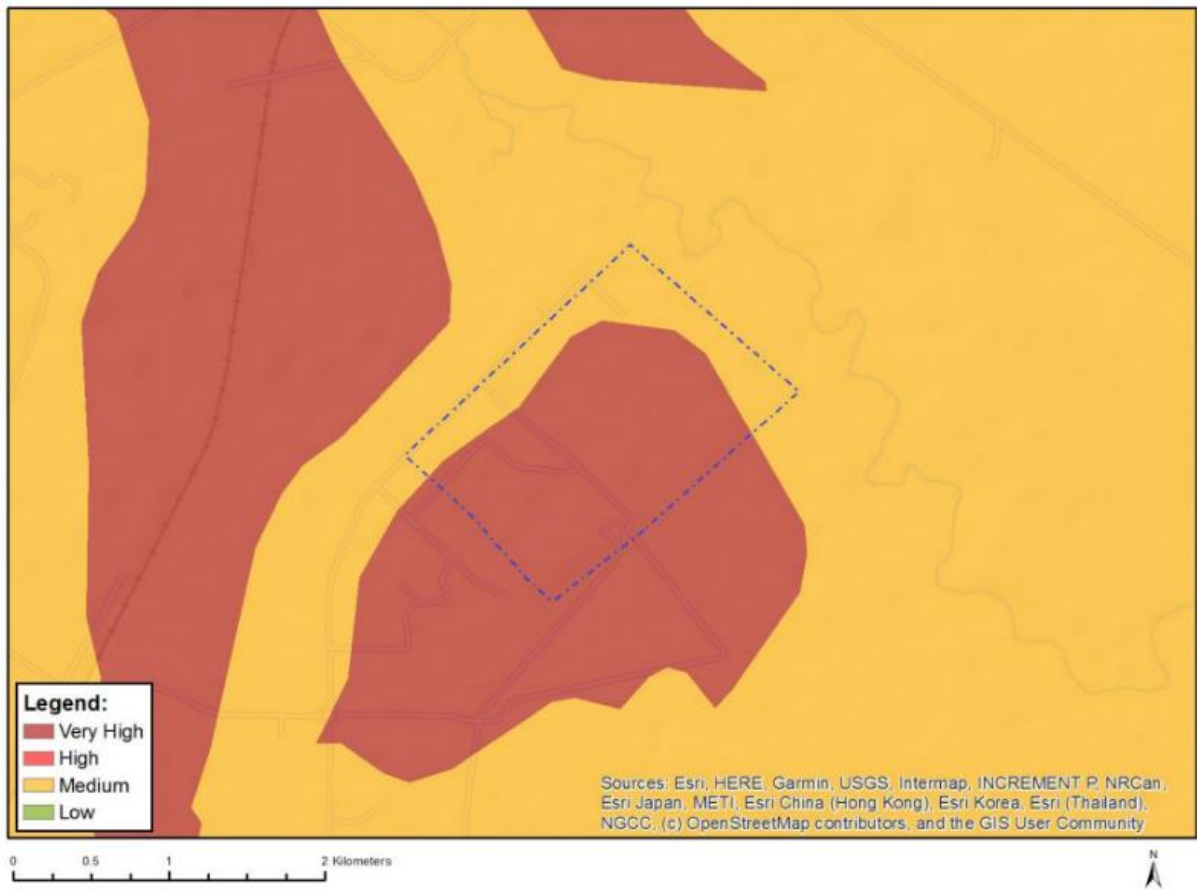


Figure 10: Map of relative palaeontology theme sensitivity



Figure 11: Map of relative plant species theme sensitivity



Figure 12: Map of relative RFI theme sensitivity



Figure 13: Map of relative terrestrial biodiversity theme sensitivity

7.3 Sub-section 3: Declaration

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

Signature Proponent/applicant/ holder of EA

Date:

Signed by:Thomas John Wilson
Signed at:2022-11-11 09:27:31 +02:00
Reason:Witnessing Thomas John Wilson



This declaration will be signed by the proponent/applicant/holder of the EA once the contractor is appointed and has provided inputs to this Generic EMPr as per the requirements of this template.

7.4 Sub-section 4: amendments to site specific information (Part B; section 2)

Should the EA be transferred to a new holder, Part B: Section 2 must be completed by the new holder and submitted with the application for an amendment of the EA in terms of Regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted for an amendment to an environmental authorisation will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

PART C

8 SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES

If any specific environmental sensitivities/attributes are present on the site which require more specific impact management outcomes and actions, not included in the pre-approved EMPr template, to manage impacts, those impact management outcomes and impact management actions must be included in this section. These specific management controls must be referenced spatially and must include impact management outcomes and impact management actions. The management controls including impact management outcomes and impact management actions must be presented in the format of the pre-approved EMPr template. This applies only to additional impact management outcomes and impact management actions that are necessary.

If Part C is applicable to the development as authorised in the EA, it is required to be submitted to the CA together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and the name and expertise of the EAP, including the curriculum vitae are to be included. Once approved, Part C forms part of the EMPr for the site and is legally binding.

This section will **not be required** should the site contain no specific environmental sensitivities or attributes.

CONSTRUCTION AND DECOMMISSIONING OUTCOMES AND ACTIONS

7.1 Ecology (Fauna and Flora)

Impact management outcome: Direct loss of vegetation, including listed and protected species is reduced.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|--|--------------------|--|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Timeframe | Evidence of compliance |
| – Pre-construction walk-through of the grid corridor to locate species of conservation concern that can be translocated or avoided. | dEO, Specialist | Visual inspection of the layout with walk-through report produced | Prior to construction | ECO | Once prior to commencement of construction | Walk-through report produced and kept on file during construction |
| – Vegetation clearing to commence only after walkthrough has been conducted and necessary permits obtained | Contractor | Clearing vegetation in line with the obtained permits | Prior to commencement of construction | ECO | Once prior to commencement of construction | Record of permits |
| – Demarcate all areas to be cleared with construction tape or similar material where practical. However, caution should be exercised to avoid using material that might entangle fauna. | Contractor | Erect appropriate temporary barriers around construction areas and ensure material used is fauna-friendly and must be removed following completion of construction. | At the commencement and for the duration of the construction phase | ECO | Monthly | Access to construction area is closed-off through temporary barriers and barriers are maintained to a sufficient standard |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|-----------------------------|---|--------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Timeframe | Evidence of compliance |
| | | | | | | Material used to demarcate construction area is fauna-friendly and removed following completion of construction. |
| <ul style="list-style-type: none"> – Ensure that laydown areas, construction camps and other temporary use areas are located in areas of low and medium sensitivity and are properly fenced or demarcated as appropriate and practically possible. | cEO, Specialist, Contractor | Laydown areas to be defined during planning of construction activities | Duration of construction phase | ECO | Weekly | Laydown areas located within previously transformed areas or areas of low sensitivity |
| <ul style="list-style-type: none"> – Pre-construction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes topics such as no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc. | cEO | Requirement for induction of all staff prior to commencement activities, as well as the development and application of an induction programme | Duration of construction phase | ECO | Monthly | Induction roster of all staff completed, maintained and available on site, induction programme material observed and on file on site. |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--|---|--|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Timeframe | Evidence of compliance |
| <p>– Demarcate all areas to be cleared with construction tape or other appropriate and effective means. However, caution should be exercised to avoid using material that might entangle fauna.</p> | dEO / cEO in consultation with the ECO | Erect appropriate temporary barriers around construction areas and ensure material used is fauna-friendly and must be removed following completion of construction. | At the commencement and for the duration of the construction phase | ECO | Monthly | <p>Access to construction area is closed-off through temporary barriers and barriers are maintained to a sufficient standard</p> <p>Material used to demarcate construction area is fauna-friendly and removed following completion of construction.</p> |
| <p>– Pre-construction walk-through of the footprint to locate any active burrows within the site. If there are any active burrows present, the resident fauna should be captured and translocated prior to construction.</p> | cEO, Specialist | Develop a search and relocation plan for fauna species and obtain the relevant permits for the removal of protected species | Prior to construction | ECO | Monthly | <p>No fauna unnecessarily harmed by construction activities</p> <p>Necessary permits obtained prior to the removal of threatened</p> |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|-----------------------------|---|------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Timeframe | Evidence of compliance |
| | | | | | | fauna species, and copies of permits observed during audit |
| – During construction, any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person. | cEO, Specialist, Contractor | Implement search and relocation plan for threatened or dangerous fauna species and obtain the relevant permits for the removal of these species | Operation | Auditor | Annually | No fauna harmed as a result of maintenance activities. Necessary permits obtained prior to the removal of threatened fauna species, and copies of permits observed during audit. |
| – The illegal collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off of the construction site. | Contractor cEO | Awareness created regarding prohibition on the collection, hunting or harvesting of any plants or animals | Duration of construction | ECO | Weekly | No evidence of collection, hunting or harvesting of any plants or animals |
| – No fires should be allowed within the site as there is a risk of runaway veld fires. | cEO | Awareness created regarding the prohibition of fires on site | Duration of construction | ECO | Weekly | No fires on site |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|-------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Timeframe | Evidence of compliance |
| – No fuelwood collection should be allowed on-site. | cEO, Developer | Place signs on site indicating the fuelwood collection is prohibited and include this point in the environmental induction training | During the construction phase | ECO | Weekly | Sign prohibiting collection of fuelwood observed on site and evidence of discussion of this point contained in environmental induction training material |
| – All construction vehicles should adhere to a low-speed limit (40km/h for cars and 30km/h for trucks) to avoid collisions with susceptible species such as snakes and tortoises and rabbits or hares. Speed limits should apply within the facility as well as on the public gravel access roads to the site. | Contractor, cEO | Install speed signage throughout site, include speed limit into induction and ensure all staff entering site are aware of the requirement to implement speed limits. Institute verbal and written warnings for violations and appropriate fines for repeat contraventions. Written log of fines and warning issued kept on site | During the construction phase | ECO | Monthly | Minimal instances of speeding as observed on site during audits and as evidenced in the written log of warnings and fines issued for contraventions |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|--------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Timeframe | Evidence of compliance |
| <ul style="list-style-type: none"> All personnel should undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and snakes which are often persecuted out of fear or superstition. | cEO | Requirement for induction of all staff prior to entry, as well as the development and application of an induction programme | Duration of construction phase | ECO | Monthly | Induction roster of all staff completed, maintained and available on site, induction programme material observed and on file on site during audits |

7.2 Avifauna

Impact management outcome: Displacement of priority bird species and collision trauma

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------------------|--|-------------------------------|--------------------|-----------------------------------|----------------------------------|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| <ul style="list-style-type: none"> Reduce or minimise the use of outdoor lighting to avoid attracting birds to the lights or to reduce potential disorientation to migrating birds. | Developer cEO Contractor | Communicate this requirement to the appropriate Contractor | During the construction phase | ECO | Throughout the construction face. | Use of minimal lighting observed |

7.3 Land Use, Soils and Agricultural Potential

Impact management outcome: Maximise conservation of soils resources.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|-------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Ensure that proper stormwater management designs are set in place. | Design Engineer | Prepare an effective stormwater management plan and designs prior to the commencement of construction. | Pre-construction | ECO | Monthly | Evidence of appropriate stormwater management features as part of project design. |
| – Only the proposed and authorised access roads are to be used, this is to reduce any unnecessary compaction of adjacent areas. | Contractor cEO | Ensure that only authorised access roads are used during the construction phase. Visual inspection of the site to determine whether only authorised access roads are being utilised on site. | During the construction phase | ECO | Monthly | Visual observation of authorised access roads being utilised on site. |
| – Prevent any spills from occurring. Machines must be parked within hard park areas and must be checked daily for fluid leaks. | Contractor cEO | Vehicle and equipment storage areas must have hard surfaces and must be | During the construction phase | ECO | Monthly | Vehicle and equipment storage areas have hard surfaces and are |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|---|--------------------|-----------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | appropriately banded. | | | | appropriately banded. No spills recorded in the site incident register. |
| – Proper invasive plant control must be undertaken quarterly. | Contractor cEO | Ensure that invasive plant control is undertaken on an ongoing basis (at least quarterly). | During the construction phase | ECO | As and where required | Photographic proof of invasive plant control being undertaken on site. |
| – All excess soil (soil that are stripped and stockpiled to make way for foundations) must be stored, continuously managed / maintained to be used for rehabilitation of eroded areas. | Contractor cEO | Development a procedure for the removal, handling, and storage of soil and ensure implementation of this procedure during the construction phase. | During the construction phase | ECO | Monthly | Copy of procedure for the removal, handling, and storage of soil provided during the review. Visual observation of appropriate soil storage and handling practices on site. |
| – Rip all compacted areas outside of the developed areas that have been compacted. | Contractor cEO | Ensure that ripping is undertaken on all compacted areas outside of the development areas. | Following completion of the construction phase. | ECO | Monthly | Visual observation of ripping being undertaken on compacted areas outside the development areas. |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|-------------------------|--|-------------------------------|--------------------|----------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Ripping must be done by means of a commercial ripper that has at least two rows of tines. | Contractor Developer | Utilise a commercial ripper with at least two rows of tines for ripping purposes. | During the construction phase | ECO | As and when required | Ripping undertaken using a commercial ripper with at least two rows of tines. |
| – Ripping must take place between 1 and 3 days after seeding and following a rainfall event (seeding must therefore be carried out directly after a rainfall event). | Contractor cEO | Ensure that ripping is undertaken between 1 and 3 days after seeding and following a rainfall event. | During the construction phase | ECO | As and when required | Visual observation of ripping being undertaken between 1 and 3 days after seeding and following a rainfall event. |
| – All areas surrounding the development footprint areas that have been degraded by traffic, laydown yards etc. must be ripped and revegetated by means of indigenous grass species. | Contractor cEO | Ensure that areas surrounding the development footprint areas are ripped and revegetated by means of indigenous grass species. | During the construction phase | ECO | As and when required | Visual observation of ripping and revegetation of areas surrounding the development footprint areas with indigenous grass species. |

7.4 Heritage

Impact management outcome: Impacts on heritage and potential burial sites

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|------------------------------------|--|------------------------------|--------------------|--------------------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – 30m Buffer area recommended around site JL2 | Developer/ design consultant | Ensure that 30m 'no-go' buffer are implemented around the site | Prior to construction | ECO | Once-off prior to construction | Project infrastructure avoids the area within the 30m buffer zone for the site, as per the final layout. |
| – 50m Buffer area recommended around site JL5 | Developer/ design consultant | Ensure that 50m 'no-go' buffer are implemented around the site | Prior to construction | ECO | Once-off prior to construction | Project infrastructure avoids the area within the 50m buffer zone for the site, as per the final layout. |

7.5 Visual

Impact management outcome: Visual impact of construction activities on sensitive visual receptors, and the potential impact on the sense of place is reduced.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|---|---|--------------------|---------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Retain and maintain natural vegetation immediately adjacent to the development footprint. | Project proponent/ design consultant Contractor cEO | Visual inspection of the layout to ensure that vegetation immediately adjacent to the development | Prior to construction and during construction | ECO | Ongoing throughout construction | Onsite evidence that natural vegetation immediately adjacent to the development footprint/servitu |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | <p>footprint will not be disturbed</p> <p>Ensure that natural vegetation immediately adjacent to the development footprint/servitude is retained and maintained.</p> | | | | de is retained and maintained. |
| – Consult adjacent landowners (if present) in order to inform them of the development and to identify any (valid) visual impact concerns. | Developer | Consultation between the developer and adjacent landowners. | During construction | ECO | As and when required | Proof of consultation with adjacent landowners |
| – Ensure that vegetation is not unnecessarily removed during the construction phase. | Contractor cEO | <p>Visual inspection of the project site to ensure that no unnecessary vegetation clearance is being undertaken.</p> <p>Include this mitigation in the contractor's environmental awareness training.</p> | During construction | ECO | Daily, during the vegetation clearance phase and monthly thereafter | Onsite evidence that not unnecessary vegetation clearance is being undertaken. |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--|---|--|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| <p>– Plan the placement of laydown areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) wherever possible.</p> | <p>Project proponent/ design consultant</p> <p>Contractor</p> <p>cEO</p> | <p>Ensure that temporary construction infrastructure in the final layout is placed within already disturbed areas, where possible.</p> <p>Ensure that temporary construction infrastructure is established within already disturbed areas, where possible, during the construction phase.</p> | <p>Prior to construction and during construction</p> | <p>ECO</p> | <p>Once-off review of the final layout prior to construction and as and when required during the construction phase</p> | <p>Photographic proof that temporary construction infrastructure is placed in already disturbed areas, where possible.</p> <p>Final layout shows placement of temporary construction infrastructure within already disturbed areas.</p> |
| <p>– Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads.</p> | <p>Contractor</p> | <p>Demarcate construction site to restrict movement within the construction site and immediate area. Inform the contractors, through inclusion of this condition in the environmental</p> | <p>Duration of the construction phase</p> | <p>ECO</p> | <p>Monthly</p> | <p>Reduced duration of the construction phase. Copy of construction programme provided during audit</p> |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|------------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | awareness training and contractor's packs, that movement should be restricted to existing access roads. | | | | |
| – Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities. | Contractor | Waste to be appropriately stored in designated areas. Disposal of waste at licensed waste disposal facilities must be undertaken as per the waste management plan | Duration of the construction phase | ECO | Monthly | Appropriate storage of waste in designated areas. Disposal certificates of disposal at licensed facilities to be provided |
| – Reduce and control construction dust using approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent). | Contractor | Apply appropriate dust suppression techniques. | Duration of the construction phase | ECO | Weekly | Contractor to provide proof of use of appropriate dust suppression technique. Photographic evidence that dust suppression is being undertaken on site |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------------------|--|--------------------------------------|--------------------|--|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts. | Developer Contractor cEO | Ensure that working hours are clearly communicated to construction workers and that the working hours are restricted to daylight hours and are adhered to. | Duration of the construction phase | ECO | Daily | Limited construction activities taking place at night. |
| - Remove infrastructure not required for the post-decommissioning use. | Contractor | Removal of all infrastructure not required for the post-decommissioning use. | At the end of the Construction Phase | ECO dEO | Once, following the completion of the construction phase | No infrastructure that is not required for the post-decommissioning use is present following the completion of the construction phase. |
| - Rehabilitate all disturbed areas immediately after the completion of construction works. | Contractor cEO | Ensure that disturbed areas are rehabilitated immediately after completion of construction works and that this is communicated to the contractor. Develop and implement a | Following completion of construction | ECO | As and when required | Visual observation that disturbed areas are rehabilitated immediately after the completion of construction works. |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---------------------------|--------------------|-----------------------------------|------------------------------|--------------------|-----------|------------------------|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | rehabilitation plan for the site. | | | | |

OPERATIONAL PHASE OUTCOMES AND ACTIONS

7.6 Ecology (Fauna and Flora)

Impact management outcome: Direct loss of vegetation, including listed and protected species is reduced.

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|-----------------------------|---|------------------------------|--------------------|----------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - Any potentially dangerous fauna such as snakes or fauna threatened by the maintenance and operational activities should be removed to a safe location. | cEO, Specialist, Contractor | Develop a search and relocation plan for threatened or dangerous fauna species and obtain the relevant permits for the removal of these species | Operation and maintenance | dEO | As and when required | Necessary permits obtained prior to the removal of threatened fauna species, and copies of permits observed during audit. |
| - All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. | Contractor | Suitable bunding and containment, demarcation and access control measures implemented for hazardous materials at onsite stores. Spill prevention and response plan developed, and | Duration of the project | dEO | Monthly | Effective bunding and containment of hazardous materials as evidenced on site, along with suitable access control and demarcation provided at hazardous materials stores. Written log of |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|-------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | spill kits made available, as well as all staff inducted with spill response procedure and a log of inductions kept on file. Written record of spills and clean up actions kept on site | | | | spills and clean up actions implemented observed and kept on file at site |
| - All vehicles accessing the site should adhere to a low-speed limit (30km/h max) to avoid collisions with susceptible species such as snakes and tortoises. | Contractor, cEO | Install speed signature throughout site, include speed limit into induction and ensure all staff entering site is aware of the requirement to implement speed limits. Institute verbal and written warnings for violations and appropriate fines for repeat contraventions. | During the construction phase | dEO | Monthly | Minimal instances of speeding as observed on site during audits and as evidenced in the written log of warnings and fines issued for contraventions |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|------------------------|--|--|-----------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | Written log of fines and warning issued kept on site | | | | |
| - Alien plant control and erosion management at the site should take place according to the respective management plans. | Operator Specialist | Invasive Alien Plant species eradication and management programme developed for the construction phase of the project, detailing monitoring required, control methods and frequency. | Operation | External Auditor, dEO | Annually – external audit and quarterly dEO | Invasive alien plant species appropriately managed |
| - All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. | Contractor, cEO | Develop and implement a stormwater management plan | Prior to construction commencing, and for the duration of construction and operation phase | dEO/cEO | Monthly | Evidence of implementation of the stormwater management plan is observed |
| - Regular monitoring for alien plant invasion and erosion after construction to ensure that no invasion or erosion problems have developed as result of the disturbance must be undertaken, as per the respective Management Plans for the project. | Operator Specialist | Invasive Alien Plant species eradication and management programme | Operation | External Auditor, dEO | Annually – external audit and quarterly dEO | Invasive alien plant species appropriately managed |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-------------------------------------|--------------------|---------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | developed for the construction phase of the project, detailing monitoring required, control methods and frequency. | | | | |
| - All disturbed areas that are not used such as excess road widths, should be rehabilitated with locally occurring shrubs and grasses after construction to reduce the overall footprint of the development. | Contractor, cEO | Visual inspection of infrastructure to determine if all areas have been re-vegetated | Operation phase | cEO, dEO | Monthly | No evidence of disturbed areas affected by development and negligible erosion observed |
| - No planting or importing any listed invasive alien plant species (all Category 1a, 1b and 2 invasive species) to the site for landscaping, rehabilitation or any other purpose must be undertaken. | Contractor cEO | Identify listed alien invasive plants which may not be used for rehabilitation | Prior to operation (rehabilitation) | cEO, dEO | When required | No evidence of identified alien invasive species for site landscaping or rehabilitation |

7.7 Heritage

Impact management outcome: Impacts on graves and burial grounds reduced.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|------------------------------------|--|------------------------------|--------------------|--------------------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - 30m Buffer area recommended around site HM4 | Developer/ design consultant | Ensure that 30m 'no-go' buffer are implemented around the site | Prior to construction | ECO | Once-off prior to construction | Project infrastructure avoids the area within the 30m buffer zone for the site, as per the final layout. |
| - 30m Buffer area recommended around site JL2 | Developer/ design consultant | Ensure that 30m 'no-go' buffer are implemented around the site | Prior to construction | ECO | Once-off prior to construction | Project infrastructure avoids the area within the 30m buffer zone for the site, as per the final layout. |

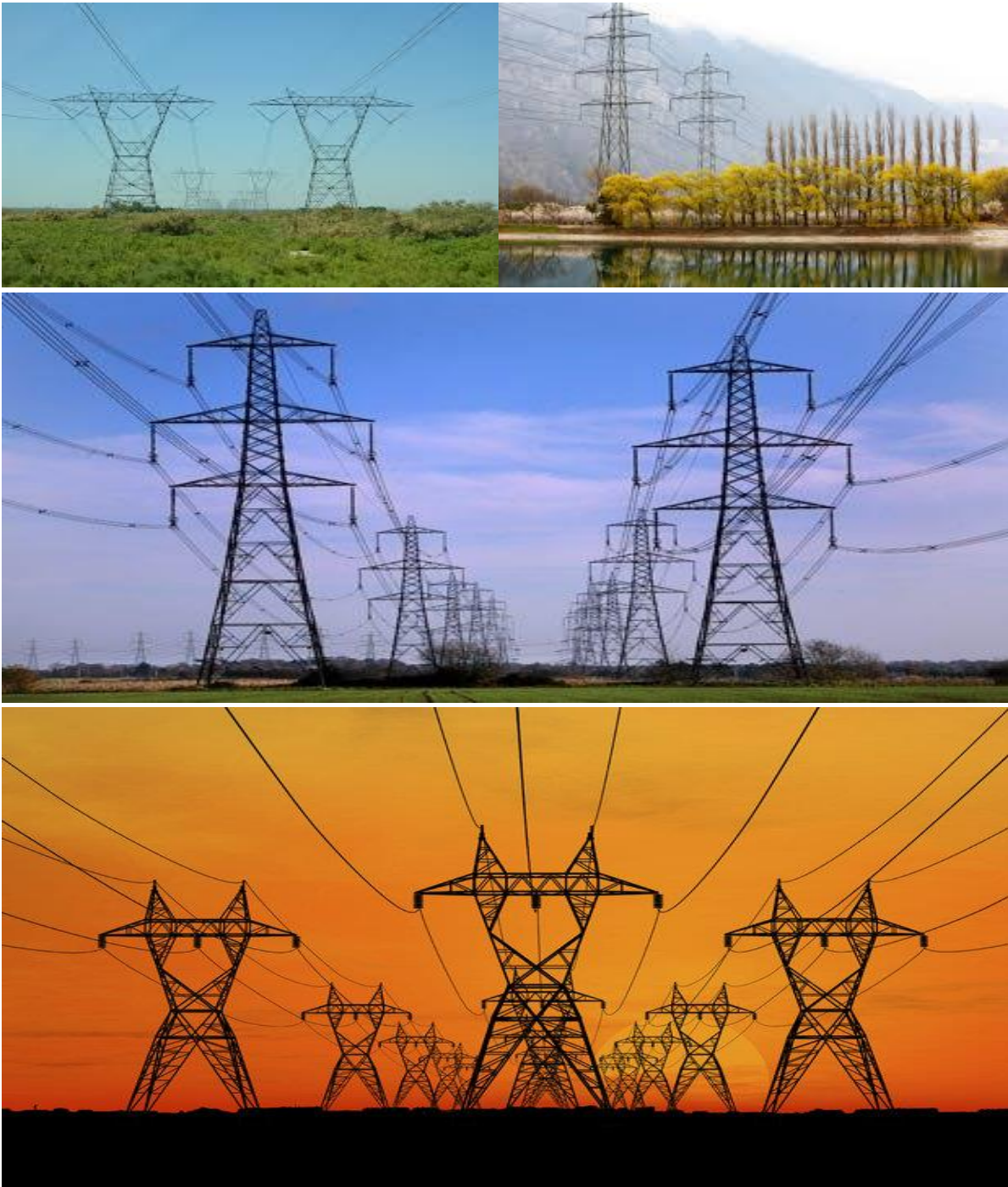
Appendix 2 – Overhead Power Line EMPr

18MW HARMONY JOEL SOLAR PHOTOVOLTAIC (PV) FACILITY, FREE STATE PROVINCE

Environmental Management Programme for the
power line associated with the 18MW Harmony Joel
Solar PV Facility

May 2023

APPENDIX 1
ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR THE
DEVELOPMENT AND EXPANSION FOR ELECTRICITY
TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE





environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

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» INTRODUCTION

1. Background

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) requires that an environmental management programme (EMPr) be submitted where an environmental impact assessment (EIA) has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation (EA). The content of an EMPr must either contain the information set out in Appendix 4 of the Environmental Impact Assessment Regulations, 2014, as amended, (EIA Regulations) or must be a EMPr relevant to an application as identified and gazetted by the Minister in a government notice. Once the Minister has identified, through a government notice, that a EMPr is relevant to an application for EA, that EMPr must be applied by all parties involved in the EA process, including, but not limited to, the applicant and the competent authority (CA).

2. Purpose

This document constitutes an EMPr relevant to applications for the development or expansion of electricity transmission and distribution infrastructure, and all listed and specified activities necessary for the realisation of such infrastructure.

3. Objective

The objective of this EMPr is to prescribe and pre-approve generally accepted impact management outcomes and impact management actions, which can commonly and repeatedly be used for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of electricity transmission and distribution infrastructure. The use of an EMPr is intended to reduce the need to prepare and review individual EMPrs for applications of a similar nature.

4. Scope

The scope of this EMPr applies to the development or expansion of electricity transmission and distribution infrastructure requiring EA in terms of NEMA, i.e. with a capacity of 33 kilovolts or more. This EMPr applies to activities requiring EA, mainly activity 11 and 47 of the Environmental Impact Assessment Regulations Listing Notice 1 of 2014, as amended, and activity 9 of the Environmental Impact Assessment Regulations Listing Notice 2 of 2014, as amended, and all associated listed or specified activities necessary for the realisation of such infrastructure.

5. Structure of this document

This document is structured in three parts with an Appendix as indicated in the table below:

| Part | Section | Heading | Content |
|------|---------|---|--|
| A | | Provides general guidance and information and is not legally binding | Definitions, acronyms, roles & responsibilities and documentation and reporting. |
| B | 1 | Pre-approved EMPr template | <p>Contains generally accepted impact management outcomes and impact management actions required for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of electricity transmission and distribution infrastructure, which are presented in the form of a template that has been pre-approved.</p> <p>The template in this section is to be completed by the contractor, with each completed page signed and dated by the holder of the EA prior to commencement of the activity.</p> <p>Where an impact management outcome is not relevant, the words "not applicable" can be inserted in the template under the "responsible persons" column.</p> <p>Once completed and signed, the template represents the EMPr for the activity approved by the CA and is legally binding. The template is not required to be submitted to the CA as once the EMPr is gazetted for implementation, it has been approved by the CA.</p> <p>To allow interested and affected parties access to the pre-approved EMPr template for consideration through the decision-making process, the EAP on behalf of the applicant /proponent must make the hard copy of this EMPr available at a public location and where the applicant has a website, the EMPr should also be made available on such publicly accessible website.</p> |
| | 2 | Site specific information | Contains preliminary infrastructure layout and a declaration that the applicant/holder of the EA will comply with the pre-approved EMPr template contained in <u>Part B: Section 1</u> , and |

| Part | Section | Heading | Content |
|------|---------|---|---|
| | | | <p>understands that the impact management outcomes and impact management actions are legally binding. The preliminary infrastructure layout must be finalized to inform the final EMPr that is to be submitted with the basic assessment report (BAR) or environmental impact assessment report (EIAR), ensuring that all impact management outcomes and actions have been either pre-approved or approved in terms of <u>Part C</u>.</p> <p>This section must be submitted to the CA together with the final BAR or EIAR. The information submitted to the CA will be considered to be incomplete should a signed copy of <u>Part B: section 2</u> not be submitted. Once approved, this Section forms part of the EMPr for the development and is legally binding.</p> |
| C | | Site specific sensitivities/ attributes | <p>If any specific environmental sensitivities/ attributes are present on the site which require site specific impact management outcomes and impact management actions, not included in the pre-approved EMPr, to manage impacts, these specific impact management outcomes and impact management actions must be included in this section. These specific environmental attributes must be referenced spatially and impact management outcomes and impact management actions must be provided. These specific impact management outcomes and impact management actions must be presented in the format of the pre-approved EMPr template (<u>Part B: section 1</u>)</p> <p>This section will not be required should the site contain no specific environmental sensitivities or attributes. However, if <u>Part C</u> is applicable to the site, it is required to be submitted together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP, and must contain his/her name and expertise including a curriculum vitae. Once</p> |

| Part | Section | Heading | Content |
|------|---------|------------|---|
| | | | <p>approved, Part C forms part of the EMPr for the site and is legally binding.</p> <p>This section applies only to additional impact management outcomes and impact management actions that are necessary for the avoidance, management and mitigation of impacts and risks associated with the specific development or expansion and which are not already included in <u>Part B: section 1</u>.</p> |
| | | Appendix 1 | <p>Contains the method statements to be prepared prior to commencement of the activity. The method statements are not required to be submitted to the competent authority.</p> |

6. Completion of part B: section 1: the pre-approved EMPr template

The template is to be completed prior to commencement of the activity, by providing the following information for each environmental impact management action:

- For implementation
 - a 'responsible person',
 - a method for implementation,
 - a timeframe for implementation
- For monitoring
 - a responsible person
 - frequency
 - evidence of compliance.

The completed template must be signed and dated by 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 be signed and dated on each page by 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.

7. Amendments of the impact management outcomes and impact management actions

Once the activity has commenced, a holder of an EA may make amendments to the impact management outcomes and impact management actions in the following manner:

- Amendment of the impact management outcomes: in line with the process contemplated in regulation 37 of the EIA Regulations; and
- Amendment of the impact management actions: in line with the process contemplated in regulation 36 of the EIA Regulations.

8. Documents to be submitted as part of part B: section 2 site specific information and declaration

Part B: Section 2 has three distinct sub-sections. The first and third sub-sections are in a template format. Sub-section two requires a map to be produced.

Sub-section 1 contains the project name, the applicant's name and contact details, the site information, which includes coordinates of the corridor in which the proposed electricity transmission and distribution infrastructure is proposed as well as the 21-digit Surveyor General code of each cadastral land parcel and, where available, the farm name.

Sub-section 2 is to be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout using the national web based environmental screening tool, when available for compulsory use at: <https://screening.environment.gov.za/screeningtool>. The sensitivity map shall identify the nature of each sensitive feature e.g. raptor nest, threatened plant species, archaeological site, etc. Sensitivity maps must identify features both within the planned working area and any known sensitive features in the surrounding landscape within 50m from the development footprint. The transmission and distribution profile must be illustrated at an appropriate resolution to enable fine scale interrogation. It is recommended that <20 km of transmission and distribution length is illustrated per page in A3 landscape format. Where considered appropriate, photographs of sensitive features in the context of tower positions must be used.

Sub-section 3 is the declaration that the applicant/proponent or holder of the EA in the case of a change of ownership must complete, which confirms that the applicant/EA holder will comply with the pre-approved EMPr template in Section 1 and understands that the impact management outcomes and actions are legally binding.

(a) Amendments to Part B: Section 2 – site specific information and declaration

Should the EA be transferred, Part B: Section 2 must be completed by the new applicant/proponent and submitted with the application for an amendment of the EA in terms of Regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted as part of such an application for an amendment to an EA will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

» PART A – GENERAL INFORMATION

1. DEFINITIONS

In this EMPr any word or expression to which a meaning has been assigned in the NEMA or EIA Regulations has that meaning, and unless the context requires otherwise –

"clearing" means the clearing and removal of vegetation, whether partially or in whole, including trees and shrubs, as specified;

"construction camp" is the area designated for key construction infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous 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;

"contractor" - The Contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract, are in line with the Environmental Management Programme and that Method Statements are implemented as described.

"hazardous substance" is a substance governed by the Hazardous Substances Act, 1973 (Act No. 15 of 1973) as well as the Hazardous Chemical and Substances Regulations, 1995;

"method statement" means a written submission by the Contractor to the Project Manager in response to this EMPr or a request by the Project Manager and ECO. The method statement must set out the equipment, materials, labour and method(s) the Contractor proposes using to carry out an activity identified by the Project Manager when requesting the Method Statement. This must be done in such detail that the Project Manager and ECO is able to assess whether the Contractor's proposal is in accordance with this specification and/or will produce results in accordance with this specification;

The method statement must cover applicable details with regard to:

- (i) Construction procedures;
- (ii) Plant, materials and equipment to be used;
- (iii) Transporting the equipment to and from site;
- (iv) How the plant/ material/ equipment will be moved while on site;
- (v) How and where the plant/ material/ equipment will be stored;
- (vi) The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- (vii) Timing and location of activities;
- (viii) Compliance/ non-compliance; and
- (ix) Any other information deemed necessary by the Project Manager.

"slope" means the inclination of a surface expressed as one unit of rise or fall for so many horizontal units;

“**solid waste**” means all solid waste, including construction debris, hazardous waste, excess cement/ concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers);

“**spoil**” means excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works;

“**topsoil**” means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility, appearance, structure, agricultural potential, fertility and composition of the soil; and

“**works**” means the works to be executed in terms of the Contract

2. ACRONYMS and ABBREVIATIONS

| | |
|-------------------|--|
| CA | Competent Authority |
| cEO | Contractors Environmental Officer |
| dEO | Developer Environmental Officer |
| DPM | Developer Project Manager |
| DSS | Developer Site Supervisor |
| EAR | Environmental Audit Report |
| ECA | Environment Conservation Act No. 73 of 1989 |
| ECO | Environmental Control Officer |
| EA | Environmental Authorisation |
| EIA | Environmental Impact Assessment |
| ERAP | Emergency Response Action Plan |
| EMPr | Environmental Management Programme Report |
| EAP | Environmental Assessment Practitioner |
| FPA | Fire Protection Agency |
| HCS | Hazardous chemical Substance |
| NEMA | National Environmental Management Act, 1998 (Act No. 107 of 1998) |
| NEMBA | National Environmental Management: Biodiversity Act ,2004 (Act No. 10 of 2004) |
| NEMWA | National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) |
| MSDS | Material Safety Data Sheet |
| RI&APs | Registered interested and affected parties |

3. ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) IMPLEMENTATION

The effective implementation of this EMPr is dependent on established and clear roles, responsibilities and reporting lines within an institutional framework. This section of the EMPr gives guidance to the various environmental roles and reporting lines, however, project specific requirements will ultimately determine the need for the appointment of specific person(s) to undertake specific roles and or responsibilities. As such, it must be noted that in the event that no specific person, for example, an environmental control officer (ECO) is appointed, the holder of the EA remains responsible for ensuring that the duties indicated in this document for action by the ECO are undertaken.

Table 1: Guide to roles and responsibilities for implementation of an EMPr

| Responsible Person (s) | Role and Responsibilities |
|-----------------------------------|---|
| Developer's Project Manager (DPM) | <p><u>Role</u></p> <p>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.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - 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) | <u>Role</u> |

| Responsible Person (s) | Role and Responsibilities |
|-------------------------------------|---|
| | <p>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.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - 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) | <p><u>Role</u></p> <p>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 and dEO. 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.</p> <p>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&APs), 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</p> |

| Responsible Person (s) | Role and Responsibilities |
|------------------------|---|
| | <p>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.</p> <p><u>Responsibilities</u></p> <p>The responsibilities of the ECO will include the following:</p> <ul style="list-style-type: none"> - 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 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; |

| Responsible Person (s) | Role and Responsibilities |
|--|---|
| | <ul style="list-style-type: none"> - 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. |
| <p>developer Environmental Officer (dEO)</p> | <p><u>Role</u></p> <p>The dEOs will report to the Project Manager and are responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - 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; |

| Responsible Person (s) | Role and Responsibilities |
|--|--|
| | <ul style="list-style-type: none"> - 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 | <p><u>Role</u></p> <p>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 for electricity transmission and distribution infrastructure activities.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - 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> |

| Responsible Person (s) | Role and Responsibilities |
|------------------------|--|
| | <p>Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria:</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> - 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. |

4. ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE

To ensure accountable and demonstrated implementation of the EMPr, a number of reporting systems, documentation controls and compliance mechanisms must be in place for all electricity transmission and distribution infrastructure projects as a minimum requirement.

4.1 Document control/Filing system

The holder of the EA is solely responsible for the upkeep and management of the EMPr file. At a minimum, all documentation detailed below will be stored in the EMPr file. A hard copy of all documentation shall be filed, while an electronic copy may be kept where relevant. A duplicate file will be maintained in the office of the DSS (where applicable). This duplicate file must remain current and up-to-date. The filing system must be updated and relevant documents added as required. The EMPr file must be made available at all times on request by the CA or other relevant authorities. The EMPr file will form part of any environmental audits undertaken as prescribed in the EIA Regulations.

4.2 Documentation to be available

At the outset of the project the following preliminary list of documents shall be placed in the filing system and be accessible at all times:

- Full copy of the signed EA from the CA in terms of NEMA, granting approval for the development or expansion;
- Copy of the EMPr as well as any amendments thereof;
- Copy of declaration of implementing EMPr and subsequent approval of site specific EMPr and amendments thereof;
- All method statements;
- Completed environmental checklists;
- Minutes and attendance register of environmental site meetings;
- An up-to-date environmental incident log;
- A copy of all instructions or directives issued;
- A copy of all corrective actions signed off. The corrective actions must be filed in such a way that a clear reference is made to the non-compliance record;
- Complaints register.

4.3 Weekly Environmental Checklist

The ECOs are required to complete a Weekly Environmental Checklist, the format of which is to be agreed prior to commencement of the activity. The ECOs are required to sign and date the checklist, retain a copy in the EMPr file and submit a copy of the completed checklist to the DSS on a weekly basis.

The checklists will form the basis for the Monthly Environmental Reports. Copies of all completed checklists will be attached as Annexures to the Environmental Audit Report as required in terms of the EIA Regulations.

4.4 Environmental site meetings

Minutes of the environmental site meetings shall be kept. The minutes must include an attendance register and will be attached to the Monthly Report that is distributed to attendees. Each set of minutes must clearly record "Matters for Attention" that will be reviewed at the next meeting.

4.5 Required Method Statements

The method statement will be done in such detail that the ECOs are enabled to assess whether the contractor's proposal is in accordance with the EMPr.

The method statement must cover applicable details with regard to:

- development procedures;
- materials and equipment to be used;
- getting the equipment to and from site;
- how the equipment/ material will be moved while on site;
- how and where material will be stored;
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- timing and location of activities;
- compliance/ non-compliance with the EMPr; and
- any other information deemed necessary by the ECOs.

Unless indicated otherwise by the Project Manager, the Contractor shall provide the following method statements to the Project Manager no less than 14 days prior to the commencement date of the activity:

- Site establishment – Camps, Lay-down or storage areas, satellite camps, infrastructure;
- Batch plants;
- Workshop or plant servicing;
- Handling, transport and storage of Hazardous Chemical Substances;
- Vegetation management – Protected, clearing, aliens, felling;
- Access management – Roads, gates, crossings etc.;
- Fire plan;
- Waste management – transport, storage, segregation, classification, disposal (all waste streams);
- Social interaction – complaints management, compensation claims, access to properties etc.;
- Water – use (source, abstraction and disposal), access and all related information, crossings and mitigation;
- Emergency preparedness – Spills, training, other environmental emergencies;
- Dust and noise management methodologies;
- Fauna interaction and risk management – only if the risk was identified – wildlife interaction especially on game farms; and
- Heritage and palaeontology management.

The ECOs shall monitor and ensure that the contractors perform in accordance with these method statements. Completed and agreed method statements between the holder of the EA and the contractor shall be captured in Appendix 1.

4.6 Environmental Incident Log (Diary)

The ECOs are required to maintain an up-to-date and current Environmental Incident Log (environmental diary). The Environmental Incident Log is a means to record all environmental incidents and/or all non-compliance notice would not be issued. An environmental incident is defined as:

- Any deviation from the listed impact management actions (listed in this EMPr) that may be addressed immediately by the ECOs. (For example a contractor's staff member littering or a drip tray that has not been emptied);
- Any environmental impact resulting from an action or activity by a contractor in contravention of the environmental stipulations and guidelines listed in the EMPr which as a single event would have a minor impact but which if cumulative and continuous would have a significant effect (for example no toilet paper available in the ablutions for an afternoon); and
- General environmental information such as road kills or injured wildlife.

The ECOs are to record all environmental incidents in the Environmental Incident Log. All incidents regardless of severity must be reported to the Developer. The Log is to be kept in the EMPr file and at a minimum the following will be recorded for each environmental incident:

- The date and time of the incident;
- Description of the incident;
- The name of the Contractor responsible;
- The incident must be listed as significant or minor;
- If the incident is listed as significant, a non-compliance notice must be issued, and recorded in the log;
- Remedial or corrective action taken to mitigate the incident; and
- Record of repeat minor offences by the same contractor or staff member.

The Environmental Incident Log will be captured in the EAR.

4.7 Non-compliance

A non-compliance notice will be issued to the responsible contractor by the ECOs via the DSS or Project Manager. The non-compliance notice will be issued in writing; a copy filed in the EMPr file and will at a minimum include the following:

- Time and date of the non-compliance;
- Name of the contractor responsible;
- Nature and description of the non-compliance;
- Recommended / required corrective action; and
- Date by which the corrective action to be completed.

- The contractors shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the development site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. The ECO should be made aware of any complaints. Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed. Failure to redress the cause shall be reported to the relevant CA for them to deal with the transgression, as it deems fit. The contractor is deemed not to have complied with the EMPr if, inter alia, There is a deviation from the environmental conditions, impact management outcomes and impact management actions , as approved in site specific EMPr as relevant as set out in the EMPr, which deviation has, or may cause, an environmental impact.

4.8 Corrective action records

For each non-compliance notice issued, a documented corrective action must be recorded. On receiving a non-compliance notice from the DSS, the contractor's cEO will ensure that the corrective actions required take place within the stipulated timeframe. On completion of the corrective action the cEO is to issue a Corrective Action Report in writing to the ECOs. If satisfied that the corrective action has been completed, the ECOs are to sign-off on the Corrective Action Report, and attach the report to the non-compliance notice in the EMPr file. A corrective action is considered complete once the report has signed off by the ECOs.

4.9 Photographic record

A digital photographic record will be kept. The photographic record will be used to show before, during and post rehabilitation evidence of the project as well used in cases of damages claims if they arise. Each image must be dated and a brief description note attached.

The Contractor shall:

1. Allow the ECOs access to take photographs of all areas, activities and actions.

The ECOs shall keep an electronic database of photographic records which will include:

1. Pictures of all areas designated as work areas, camp areas, development sites and storage areas taken before these areas are set up;
2. All bunding and fencing;
3. Road conditions and road verges;
4. Condition of all farm fences;
5. Topsoil storage areas;
6. All areas to be cordoned off during construction;
7. Waste management sites;
8. Ablution facilities (inside and out);
9. Any non-conformances deemed to be "significant";
10. All completed corrective actions for non-compliances;
11. All required signage;

12. Photographic recordings of incidents;
13. All areas before, during and post rehabilitation; and
14. Include relevant photographs in the Final Environmental Audit Report.

4.10 Complaints register

The ECOs shall keep a current and up-to-date complaints register. The complaints register is to be a record of all complaints received from communities, stakeholders and individuals. The Complaints Record shall:

1. Record the name and contact details of the complainant;
2. Record the time and date of the complaint;
3. Contain a detailed description of the complaint;
4. Where relevant and appropriate, contain photographic evidence of the complaint or damage (ECOs to take relevant photographs); and
5. Contain a copy of the ECOs written response to each complaint received and keep a record of any further correspondence with the complainant. The ECO's written response will include a description of any corrective action to be taken and must be signed by the Contractor, ECO and affected party. Where a damage claim is issued by the complainant, the ECOs shall respond as described in **(section 4.11)** below.

4.11 Claims for damages

In the event that a Claim for Damages is submitted by a community, landowner or individual, the ECOs shall:

1. Record the full detail of the complaint as described in **(section 4.10)** above;
2. The DPM will evaluate the claim and associated damage and submit the evaluation to the Senior Site Representative for approval;
3. Following consideration by the DPM, the claim is to be resolved and settled immediately, or the reason for not accepting the claim communicated in writing to the claimant. Should the claimant not accept this, the ECO shall, in writing report the incident to the Developer's negotiator and legal department; and
4. A formal record of the response by the ECOs to the claimant as well as the rectification of the method of making payments not amount will be recorded in the EMPr file.

4.12 Interactions with affected parties

Open, transparent and good relations with affected landowners, communities and regional staff are an essential aspect to the successful management and mitigation of environmental impacts.

The ECOs shall:

1. Ensure that all queries, complaints and claims are dealt within an agreed timeframe;

2. Ensure that any or all agreements are documented, signed by all parties and a record of the agreement kept in the EMPr file;
3. Ensure that a complaints telephone numbers are made available to all landowners and affected parties; and
4. Ensure that contact with affected parties is courteous at all times;

4.13 Environmental audits

Internal environmental audits of the activity and implementation of the EMPr must be undertaken. The findings and outcomes must be included in the EMPr file and be submitted to the CA at intervals as indicated in the EA.

An Environmental Audit Report must be prepared monthly. The report will be tabled as the key point on the agenda of the Environmental Site Meeting. The Report is submitted for acceptance at the meeting and the final report will be circulated to the Project Manager and filed in the EMPr file. At a frequency determined by the EA, the ECOs shall submit the monthly reports to the CA. At a minimum the monthly report is to cover the following:

- Weekly Environmental Checklists;
- Deviations and non-compliances with the checklists;
- Non-compliances issued;
- Completed and reported corrective actions;
- Environmental Monitoring;
- General environmental findings and actions; and
- Minutes of the Bi-monthly Environmental Site Meetings.

4.14 Final environmental audits

On final completion of the rehabilitation and/or requirements of the EA a final EAR is to be prepared and submitted to the CA. The EAR must comply with Appendix 7 of the EIA Regulations.

» **PART B: SECTION 1: Pre-approved EMPr template**

5. IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS

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

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

The completed template must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must also be duly signed and dated on each page by the contractor 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 understand 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; | ECO / cEO / dEO | Hold environmental awareness training workshops | Pre-construction Construction and Operations | ECO dEO | Monthly and as and when required | Attendance register and training minutes / notes for the record |
| – The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course; | Contractor | Scheduling of sufficient sessions through consultation with the ECO / cEO / dEO | Pre-construction Construction | ECO dEO | Monthly and as and when required | Attendance register and training minutes / notes for the record |
| – Refresher environmental awareness training is available as and when required; | cEO / dEO in consultation with the ECO | Hold refresher environmental awareness training workshops | During the construction phase | ECO dEO | Monthly and as and when required | Attendance register and training minutes / notes for the record |
| – 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; | cEO / dEO | Hold training workshops and ensure that the EA and EMPr is readily available | During the construction phase | ECO dEO | Monthly and as and when required | Attendance register and training minutes / notes for the record |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--|--|----------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| <ul style="list-style-type: none"> - The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum: <ul style="list-style-type: none"> a) Safety notifications; and b) No littering. | Contractor | Develop and place appropriate posters at key locations | Pre-construction Construction | ECO dEO cEO | Monthly | Photographic record |
| <ul style="list-style-type: none"> - Environmental awareness training must include as a minimum the following: <ul style="list-style-type: none"> 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. | cEO / dEO in consultation with the ECO | Develop environmental awareness training material which covers the minimum requirements | Pre-construction Construction | ECO dEO | Prior to the commencement of the environmental awareness training | Environmental awareness training material requirements checklist |
| <ul style="list-style-type: none"> - A record of all environmental awareness training courses undertaken as part of the EMPr must be available; | ECO / cEO / dEO | Filing system including all proof of training (i.e. attendance register and training minutes | During the construction phase | ECO dEO | Monthly | Completed and up to date filing system with proof of training |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--|---|-------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | / notes for the record) | | | | |
| – Educate workers on the dangers of open and/or unattended fires; | cEO / dEO in consultation with the ECO | Develop environmental awareness training material which covers the dangers of open and/or unattended fire | Pre-construction Construction | ECO dEO | Prior to the commencement of the environmental awareness training | Environmental awareness training material requirements checklist |
| – A staff attendance register of all staff to have received environmental awareness training must be available. | ECO / cEO / dEO | Filing system including all proof of training (i.e. attendance register) | During the construction phase | ECO dEO | Monthly | Completed and up to date filing system inclusive of all attendance registers |
| – Course material must be available and presented in appropriate languages that all staff can understand. | ECO / cEO / dEO | Develop environmental awareness training material in the required languages. Training material must be readily available to all staff | During the construction phase | ECO dEO | Monthly | Environmental awareness training material requirements checklist and the training register which must indicate the language of the training |

5.2 Site Establishment development

Impact management outcome: Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|----------------------------------|--------------------|-----------------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management; | Contractor | Development of an appropriate method statement | Pre-construction | ECO dEO | Once, prior to construction | Availability of the method statement which complies with the minimum requirements listed |
| – Location of construction 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; | DPM | Place construction camps outside of sensitive areas identified in the Basic Assessment Report | Pre-construction Construction | ECO dEO | Once, prior to construction | Availability of a layout and sensitivity map indicating avoidance of sensitive areas |
| – Sites must be located where possible on previously disturbed areas; | DPM | Place site outside of | Pre-construction | ECO dEO | Once, prior to construction | Availability of a layout and |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|---------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | sensitive areas and within previously disturbed areas identified in the BA Report | | | | sensitivity map indicating avoidance of sensitive areas and placement within disturbed areas |
| – The camp must be fenced in accordance with Section 5.5: Fencing and gate installation ; and | DPM | Design and implementation of fencing as per the requirements of Section 5.5 of this EMPr | Pre-construction & Construction | ECO dEO | Once, prior to construction and once during the construction of the fencing | The camp is fenced in accordance with Section 5.5 of this EMPr |
| – The use of existing accommodation for contractor staff, where possible, is encouraged. | DPM | Identify existing accommodation for contractor staff | Pre-construction & Construction | ECO dEO | Once, prior to construction | Contractor staff are accommodated in existing accommodation |

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; | dEO / cEO in consultation with the ECO | Spatially demarcate access restricted areas informed by the BA Report | Pre-construction | ECO | Once, prior to construction | Access restricted areas are identified and provided in a spatial format |
| – 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 | dEO / cEO in consultation with the ECO | Erect appropriate temporary barriers around access restricted areas | At the commencement and for the duration of the construction phase | ECO | Monthly | Access restricted areas are closed-off through temporary barriers and barriers are maintained to a sufficient standard |
| – Unauthorised access and development related activity inside access restricted areas is prohibited. | Contractor / dEO / cEO | Erect appropriate temporary barriers around access restricted areas and provide clear signage of restricted status | During the construction phase | ECO | Monthly, and as and when required | Photographic evidence and notes of compliance that no unauthorised access or activities has taken place within the |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---------------------------|--------------------|--------------------------|------------------------------|--------------------|-----------|-------------------------|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | access restricted areas |

5.4 Access roads

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

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|---|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Access to the servitude and tower positions must be negotiated with the relevant landowner and must fall within the assessed and authorised area; | DPM | Undertake negotiations for access to the servitude and tower positions with landowners affected by the power line | Pre-construction Construction Operation | dEO | Ongoing throughout construction and operation | Proof of negotiations with affected landowners and requirements for access to the servitude and tower positions in the form of written and signed agreements |
| – An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities; | DPM Contractor | Develop access agreements with the affected landowners. Ensure that | Pre-construction | dEO ECO | Once, prior to construction | Availability of approved and signed negotiations |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-------------------------------|--------------------|-----------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | agreements are approved and signed | | | | |
| – The access roads to tower positions must be signposted after access has been negotiated and before the commencement of the activities; | Contractor | Develop and install signs to indicate access | Pre-construction | cEO / ECO | Once, prior to construction | Photographic record of signposted access roads and GPS coordinates of where these are placed |
| – 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 | Contractor | Undertake maintenance activities on private roads used for construction as degradation takes place | During the construction phase | cEO / ECO | Weekly | Photographic record of the pre-construction condition and degradation of roads, and records of the implementation and effectiveness of maintenance activities |
| – All contractors must be made aware of all the access routes. | dEO / cEO | Develop a map illustrating all access routes associated with the project and present and | Pre-construction Construction | ECO | Once, prior to construction | Access routes map readily available |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|---------------------------------|------------------------------------|-----------------------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | provide the map to all contractors | | | | |
| – Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense; | Contractor | All access routes developed that are not in-line with the access route agreements must be closed and rehabilitated to the pre-disturbance state | Construction and Rehabilitation | cEO ECO | Bi-weekly (every two weeks) | Photographic record of the closure of access roads and re-vegetation |
| – Maximum use of both existing servitudes and existing roads must be made to minimise further disturbance through the development of new roads; | Contractor | Existing access routes to be used must be specified and the development of new roads must be avoided as far as possible | Construction and operation | cEO Operation and maintenance team | Weekly | Implementation of the approved layout |
| – 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; | dEO / cEO | Record the conditions of private roads to be used (prior to use) as per the requirements of section 4.9 and | During the construction phase | ECO | Prior to the use of private roads | Photographic record and proof of the road conditions agreed upon with the relevant parties |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|-------------------------------|--------------------------------|---|---------------------------------------|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | agree on the required condition of the roads with the landowner, DPM and contractor | | | | |
| – Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands; | DPM and Contractor | Design access roads to follow fence lines and avoid vegetated areas | Pre-construction | ECO | Once during the design and once prior to construction | Implementation of the approved layout |
| – Access roads must only be developed on pre-planned and approved roads. | Contractor | Construction of access roads only on pre-planned and approved access roads | During the construction phase | ECO once during the design dEO | Once during the design and weekly during the construction of access roads | Implementation of the approved layout |

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; | Contractor | Identify and inform all relevant staff of the existing gates to be used | Pre-construction & Construction | dEO | Monthly | Existing gates are utilised on a frequent basis and only limited new access gates are developed |
| – Existing and new gates to be recorded and documented in accordance with section 4.9: photographic record; | ECO | Existing and new gates will be recorded and documented as per the requirements of section 4.9 | During the construction phase | ECO | Once, when the construction of all new gates have been completed | Photographic record of the existing and new gates as per the requirements of section 4.9 |
| – All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner; | Contractor | Ensure all relevant gates are fitted with locks and are always locked | Construction and Operation | ECO monthly, Operation and maintenance team and cEO | Bi-weekly (every second week) | All gates are locked and no complaints from landowners are received in this regard |
| – At points where the line crosses an existing fence in which there is no suitable gate within the extent of the | dEO | Install new gates where required with the | During the construction phase | ECO | Once, prior to construction and during the | New gates are installed where |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-------------------------------|--------------------|--|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner; | | approval of the affected landowner | | | construction phase, as and when required | the power line crosses fences |
| – 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; | Contractor | Install gates in a manner so that there is a gap of no more than 100mm between the bottom of the gate and the ground | During the construction phase | cEO | Once, during the erection of the gates during the construction phase | New gates installed as per the requirement |
| – Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate; | Contractor | Implement a reinforced concrete sill beneath gates installed for jackal proofing | During the construction phase | cEO | Once, during the erection of the gates during the construction phase | New gates installed as per the requirement |
| – Original tension must be maintained in the fence wires; | Contractor | Maintain original tension of fences through required activities | During the construction phase | ECO | Monthly | No tension reduction on fence wires |
| – All gates installed in electrified fencing must be re-electrified; | Contractor | Electrify gates installed in electrified fencing | During the construction phase | ECO | Once, during the erection of the gates during the construction phase | Gates installed in electrified fencing is electrified |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|------------------------|--|-------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – All demarcation fencing and barriers must be maintained in good working order for the duration of transmission and distribution electricity infrastructure development activities; | Contractor | Undertake maintenance activities on fences and barriers | During the construction phase | ECO | Monthly | Photographic record of maintained fences and barriers |
| – Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where appropriate and would not cause harm to the sensitive flora; | Contractor | Fence construction camps, batching plants, hazardous storage areas and access restricted areas. Avoid sensitive flora | During the construction phase | ECO | Once during the erection of fencing | Photographic record of fences erected |
| – Any temporary fencing to restrict the movement of livestock must only be erected with the permission of the landowner. | dEO/ cEO Contractor | Obtain written approval from the relevant landowner where temporary fencing is required to restrict livestock movement | During the construction phase | ECO | To be monitored as temporary fencing is required | Written approval to be provided by the dEO |
| – All fencing must be developed of high quality material bearing the SABS mark; | Contractor | Make use of high quality materials approved by SABS | During the construction phase | cEO | To be monitored as fencing is erected during the construction phase | Use of high quality materials for fencing approved by SABS |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|--------------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – The use of razor wire as fencing must be avoided as far as possible; | Contractor | Razor wire must not be sourced or used for the erection of fencing | During the construction phase | ECO | To be monitored as fencing is erected during the construction phase | Fences erected do not make use of razor wire |
| – 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; | DSS and Contractor | Ensure fenced areas are locked as required through the implementation of a formalised process. Appoint a security company | During the construction phase | DPM and Contractor | DPM and Contractor | Fences are locked and no complaints from landowners are received. A security company is appointed |
| – On completion of the development phase all temporary fences are to be removed; | Contractor | Removal of all temporary fences | At the end of the Construction Phase | ECO dEO | Once, following the completion of the construction phase | No temporary fences associated with the project is present following the completion of the construction phase |
| – The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely. | Contractor | Appropriate removal of all fence uprights | At the end of the Construction Phase | ECO dEO | Once, following the completion of the construction phase | No fence uprights associated with the project is present following the |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---------------------------|--------------------|--------------------------|------------------------------|--------------------|-----------|--------------------------------------|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | completion of the construction phase |

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 |
| <ul style="list-style-type: none"> All abstraction points or bore holes must be registered with the DWS and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis; | DPM and Contractor | Obtaining relevant registrations from DWS and installation of water meters | Pre-construction | cEO | To be monitored with the installation of water meters and daily during construction and operation | Use of high quality water meters |
| <ul style="list-style-type: none"> The Contractor must ensure the following: <ul style="list-style-type: none"> 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 | Not applicable - water will not be abstracted from a river | | | | | |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|--|-------------------------------|--------------------|-----------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| c. All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented. | | | | | | |
| <ul style="list-style-type: none"> - Ensure water conservation is being practiced by: <ul style="list-style-type: none"> 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. | Contractor / dEO / cEO in consultation with the ECO | Implement the required water conservation measures throughout on-site construction processes | During the construction phase | ECO | Monthly, and as and when required | Successful implementation of water conservation |

5.7 Storm and waste water 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; | Contractor | Implement measures for the control and management of runoff | During the construction phase | cEO | Weekly | No mismanagement of runoff or contaminated water due to the temporary concrete batching plant |
| – 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; | Contractor and cEO | Obtain approved absorbent material and make use of licensed waste disposal facilities for disposal of oil | During the Construction Phase | ECO | Monthly | Availability of approved absorbent material at the construction site and proof of disposal of oil at licensed disposal facilities |
| – 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; | DPM in consultation with the ECO | Consultation between the DPM and the ECO to determine if water can be discharged directly into | During the construction phase | ECO | As and when the need arises to discharge natural stormwater runoff and clean water | Proof of consultation between the DPM and ECO and the outcomes thereof to be provided. Proof of water |

| | | | | | | |
|--|--|---|--|--|--|--|
| | | water bodies (where present). The necessary water quality testing must be undertaken prior to discharge | | | | quality testing and the results thereof. |
|--|--|---|--|--|--|--|

5.8 Solid and hazardous waste management

Impact management outcome: Waste is appropriately stored, handled and safely disposed of at a recognised waste facility.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|-------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - All measures regarding waste management must be undertaken using an integrated waste management approach; | Contractor | Develop and implement a waste management plan | During the construction phase | ECO | Monthly | Implementation of the waste management plan and proof of waste management through proof of responsible disposal |
| - Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided; | Contractor | Provision of appropriate waste collection bins strategically placed | During the construction phase | cEO | Weekly | Appropriate waste collection bins are available throughout the site |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|-------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | throughout the site | | | | |
| - A suitably positioned and clearly demarcated waste collection site must be identified and provided; | DPM and Contractor | Identify an appropriate location for the waste collection site which must be clearly demarcated through signage and temporary fencing | Design and Construction Phase | ECO | Once, prior to the commencement of construction | A waste collection site is appropriately placed and demarcated |
| - The waste collection site must be maintained in a clean and orderly manner; | Contractor | Regular collection of waste and maintenance of the area must be undertaken as per the waste requirements for the project during construction | During the Construction Phase | cEO | Weekly | The waste collection site is maintained and clean |
| - Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal; | Contractor | Provide separate and marked bins for the different waste types associated with | During the Construction Phase | cEO | Weekly | Separate waste bins are available on site and waste generated is separated into the relevant bins |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--|---|-------------------------------|--------------------|-----------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | the construction phase | | | | |
| – Staff must be trained in waste segregation; | cEO / dEO in consultation with the ECO | Include waste segregation as part of the environmental awareness training material. | Pre-construction Construction | ECO | Monthly, and as and when required | Environmental awareness training material requirements checklist |
| – Bins must be emptied regularly; | Contractor | Bins must be emptied before reaching total capacity and on a regular basis as required for the project | During the construction phase | ECO | Monthly | No mismanagement of bins. |
| – General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company; | Contractor | Disposal of general waste at licensed waste disposal facilities must be undertaken as per the waste management plan | During the construction phase | ECO | Monthly | Disposal certificates of disposal at licensed facilities to be provided |
| – Hazardous waste must be disposed of at a registered waste disposal site; | Contractor | Disposal of hazardous waste at licensed waste disposal facilities must be undertaken as | During the construction phase | ECO | Monthly | Disposal certificates of disposal at licensed facilities to be provided |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|-------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | per the waste management plan | | | | |
| – Certificates of safe disposal for general, hazardous and recycled waste must be maintained. | Contractor | Obtain certificates for safe disposal of waste | During the construction phase | ECO | Monthly | Disposal certificates of disposal at licensed facilities to be provided and filed as part of the filing system |

5.9 Protection of watercourses

Impact management outcome: Pollution and contamination of the watercourse environment and 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 sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities; | Contractor | Contractor to undertake activities which can cause spills of pollutants outside of watercourses | During the construction phase | cEO | Weekly | No incidents reported of spillage of pollutants into watercourses |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|---|-------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – In the event of a spill, prompt action must be taken to clear the polluted or affected areas; | Contractor and cEO | Develop a management plan or process for implementation should a spill take place | During the construction phase | cEO | Weekly | Feedback must be provided by the contractor in terms of how the spill was handled and photographic evidence of the feedback must be provided and kept on record |
| – Where possible, no development equipment must traverse any seasonal or permanent wetland | Not applicable – no watercourse within project site | | | | | |
| – Development of permanent watercourse crossing must only be undertaken where no alternative access to tower position is available; | Not applicable – no watercourse within project site | | | | | |
| – There must not be any impact on the long-term morphological dynamics of watercourses; | Not applicable – no watercourse within project site | | | | | |
| – Upgrading of Existing crossing points must be favoured over the creation of new crossings (including temporary access)" | Not applicable – no watercourse within project site | | | | | |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|--------------------------|------------------------------|--------------------|-----------|------------------------|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| <p>– When working in or near any watercourse, the following environmental controls and consideration must be taken:</p> <p>a) Water levels during the period of construction;</p> <p>b) Unless authorised, there should be no altering of the bed, banks, course or characteristics of a watercourse</p> <p>c) During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained;</p> <p>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</p> <p>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.</p> | Not applicable – no watercourse within project site | | | | | |

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; | cEO and contractor | Demarcate areas of indigenous vegetation to be avoided before clearance is undertaken | Construction and operation (i.e. for maintenance purposes) | ECO monthly, Operation and maintenance team weekly | Weekly, and as and when required | No unnecessary clearance of indigenous vegetation is undertaken |
| - Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species; | Contractor | Demarcate areas containing protected or endangered species to be avoided by construction activities | During the Construction Phase | ECO monthly and Operation and maintenance team weekly | Weekly, and as and when required | No clearance of protected or endangered species other than those permitted to be removed |
| - 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; | Relevant specialist in consultation with the Contractor | Develop and implement a Plant Search and Rescue Plan | Pre-construction & Construction | cEO | Weekly, and as and when required | Implementation of the Plant Search and Rescue Plan and photographic evidence and notes of the implementation of the plan |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|--|--------------------|--|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| <ul style="list-style-type: none"> Permits for removal must be obtained from the Department of Environment, Forestry and Fisheries (DEFF) prior to the cutting or clearing of the affected species, and they must be filed; and from the Department of Agriculture, Environmental Affairs, Rural Development and Land Reform for protected plants | DPM | Undertake the permitting process in order to obtain the relevant permits for the removal of protected species. Permits must be kept on file | Pre-construction | ECO | Once, prior to the commencement of the construction phase and removal of the protected species | DEFF permits on file |
| <ul style="list-style-type: none"> 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; | ECO | Ensure that the audit report indicates all species rescued and replanted and provides feedback in terms of compliance with the conditions of permits for replanting | During the Construction Phase and following the completion of the Construction Phase | ECO | Once off or as and when required | ECO confirmed rescued and replanted programme implemented correctly. |
| <ul style="list-style-type: none"> Trees felled due to construction must be documented and form part of the Environmental Audit Report; | ECO | Ensure that the audit report documents the details of trees felled | During the Construction Phase and following the completion of the Construction Phase | ECO | Once off or as and when required | ECO confirms documentation of trees felled |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris; | Contractor | Felled trees, vegetation cuttings and debris must be disposed of at a licensed waste disposal facility | During the Construction Phase | ECO | Monthly | No felled trees, vegetation cuttings and debris are dumped in inappropriate locations and disposal certificates are available as proof of responsible disposal |
| – Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator that is appropriately trained; | DPM and Contractor | A suitably qualified pest control operator must be appointed | Construction and Operation | ECO | As and when the use of herbicides is required | Only registered pest control operators must be appointed and proof of their registration must be provided |
| – A daily register must be kept of all relevant details of herbicide usage; | Contractor | Develop a daily register for the documentation of the details of herbicide usage | During the construction phase | ECO | Monthly | Daily register provided by the pest control operator |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|---|--|-------------------------------|------------------------------------|--|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| <ul style="list-style-type: none"> 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. | Contractor in consultation with the cEO | Spatially demarcate protected species and sensitive vegetation and implement appropriate fencing where required as per section 5.3 | During the construction phase | ECO | Once, during the undertaking of the demarcation of the areas and the erection of the fencing | Demarcation and fencing is undertaken in-line with the requirements of section 5.3 |
| Servitude: | | | | | | |
| <ul style="list-style-type: none"> Vegetation that does not grow high enough to cause interference with transmission and distribution infrastructures, or cause a fire hazard to any plantation, must not be cut or trimmed unless it is growing in the road access area, and then only at the discretion of the Project Manager; | Contractor in consultation with the DPM | Identify areas of vegetation not to be trimmed. | Construction and Operation | ECO Operation and maintenance team | Monthly | An indication of the areas where vegetation has not been trimmed or where vegetation has been removed from access roads must be provided. |
| <ul style="list-style-type: none"> Where clearing for access purposes is essential, the maximum width to be cleared within the servitude must be in accordance to distance as agreed between the landowner and the EA holder; | Contractor | Clearing for access must be undertaken as per the requirements provided by the | During the construction phase | ECO | Monthly, and as and when required | Proof must be provided that only agreed upon areas have been cleared |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|------------------------------|------------------------------------|-----------------------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | landowner and the EA holder | | | | |
| – Alien invasive vegetation must be removed according to a plan (in line with relevant municipal and provincial procedures, guidelines and recommendations) and disposed of at a recognised waste disposal facility; | Contractor | Undertake removal of alien invasive vegetation in accordance with the relevant guideline relevant and ensure the vegetation is disposed of at a licensed waste disposal facility | Construction and Operation | ECO Operation and maintenance team | Monthly, and as and when required | Proof must be provided that alien invasive vegetation has been cleared in accordance to the relevant guideline and that the vegetation was disposed of at a licensed waste disposal facility |
| – Vegetation must be trimmed where it is likely to intrude on the minimum vegetation clearance distance (MVCD) or will intrude on this distance before the next scheduled clearance. MVCD is determined from SANS 10280; | Contractor | Develop a procedure for the trimming of vegetation in terms of the listed requirements | Construction and operation | ECO Operation and maintenance team | Monthly, and as and when required | Proof must be provided that vegetation is trimmed in accordance with the listed requirements |
| – Debris resulting from clearing and pruning must be disposed of at a recognised waste disposal facility, unless the landowners wish to retain the cut vegetation; | Contractor | Dispose of the debris in accordance with the waste management plan | Construction and operation | ECO Operation and maintenance team | Monthly, and as and when required | Proof must be provided that the debris has been disposed of at a licensed |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|---------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | waste disposal facility |
| – In the case of the development of new transmission and distribution infrastructures, a one metre "trace-line" must be cut through the vegetation for stringing purposes only and no vehicle access must be cleared along the "trace-line". Alternative methods of stringing that limit impact to the environment must always be considered. | Contractor | Develop a procedure for the cutting of vegetation for stringing purposes | Pre-construction & Construction | ECO | Once, prior to the commencement of construction | Proof of implementation of the procedure for the cutting of vegetation for stringing purposes |

5.11 Protection of fauna

Impact management outcome: Minimise disturbance to fauna and avifauna.

| 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; | dEO / cEO Contractor | Develop a procedure for dealing with livestock within the affected properties | Pre-construction and during the construction phase | ECO | Once, prior to the commencement of construction and as and when required during the construction phase | Written consent provided by the landowner and proof of representation of the landowner during interference |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|--|--|--|--|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – The breeding sites of raptors and other wild bird species must be taken into consideration during the planning of the development programme; | dEO / cEO in consultation with the Contractor | Ensure that the planning and development programme considers breeding sites for wild bird species | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and as and when required | The planning and development programme includes the consideration of breeding sites for wild bird species |
| – 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; | dEO / cEO in consultation with the Contractor | Avoid breeding sites and ensure that special care is taken in the presence of nestlings and fledglings | During the Construction Phase Operation Phase | ECO monthly, cEO and Operation and maintenance team weekly | Weekly, and as and when required during the construction. Monthly, and as and when required during operation | Photographic record of intact breeding sites |
| – Nesting sites on existing parallel lines must be documented; | dEO / cEO in consultation with the ECO | Walk-downs of the existing lines located parallel to the project must be undertaken and nests and the details thereof documented | During the Construction Phase Operation Phase | ECO Operation and maintenance team | Quarterly, and as and when required | Details of walk-downs undertaken must be noted and kept on file and photographic records of nesting sites must be kept |
| – Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds; | dEO / cEO in consultation with the Contractor | All mitigation measures recommended by the avifauna | During the Construction Phase Operation Phase | ECO Operation and maintenance team | Monthly during construction and monthly during operation | Photographic record of compliance and successful implementation |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|--|--|---------------------------------------|-----------------------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | specialist must be implemented | | | | of the recommended measures |
| – Bird guards and diverters must be installed on the new line as per the recommendations of the specialist; | dEO / cEO in consultation with the Contractor | Recommendations made by the specialist for the installation of bird guards and diverters must be adhered to and implemented as appropriate. Bird guards and diverters must be maintained | During the Construction Phase Operation Phase | ECO Operation and maintenance team | Monthly, and as and when required | Photographic record of implementation and maintenance of bird guards and diverters |
| – 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; | dEO / cEO in consultation with the Contractor | All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement. These areas must be demarcated as Access Restricted Areas | During the Construction Phase | ECO | Monthly, and as and when required | No instances of poaching is reported |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|---|--|--|---------------------------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - No deliberate or intentional killing of fauna is allowed; | dEO / cEO in consultation with the Contractor | All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement. These areas must be demarcated as Access Restricted Areas | During the Construction Phase | ECO | Monthly, and as and when required | No instances of deliberate or intentional killing is reported |
| - In areas where snakes are abundant, snake deterrents are to be deployed on the pylons to prevent snakes climbing up, being electrocuted and causing power outages; and | dEO / cEO in consultation with the Contractor | Implement and maintain snake deterrents on pylons in areas where snakes are abundant | During the Construction Phase Operation Phase | ECO Operation and maintenance team | Once, during the construction of the pylons and as and when required. Monthly during operation | Photographic record of the implementation and maintenance of snake deterrents |
| - 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. | DPM in consultation with the dEO | Undertake a permitting process to obtain the required permits | Pre-construction | ECO | Once, prior to the commencement of construction and as and when required | Permits for removal and/relocation must be kept on file and be readily available |

5.12 Protection of heritage resources

Impact management outcome: Minimise impact to heritage resources.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|--|-------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| <ul style="list-style-type: none"> 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; | <p>DPM and a suitably qualified specialist</p> <p>dEO / cEO in consultation with the Contractor and ECO</p> | <p>Spatially identify and demarcate areas of heritage significance as per the Heritage Impact Assessment and the Heritage Walk-through Report and as per the requirements of section 5.3</p> | Pre-construction | ECO | Once, prior to the commencement of construction | Proof of avoidance of sensitive heritage features through details of avoidance and photographic records |
| <ul style="list-style-type: none"> Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance; | dEO (in consultation with specialists if/as required). | Ensure construction staff are adequately informed (via environmental awareness training) to carry out monitoring of excavations | During the Construction Phase | ECO | Monthly, or as required | Environmental awareness training includes measures relating to monitoring for chance finds |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|---|--|-------------------------------|--------------------|----------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | for fossils, artefacts and important heritage material | | | | |
| – 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. | dEO / cEO in consultation with the Contractor and ECO | Develop and implement procedures for situations where human remains, archaeological, palaeontological or historical material are uncovered | During the Construction Phase | ECO | As and when required | Proof of work ceased and the required procedures followed in cases where material is discovered. |

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.; | cEO in consultation with the Contractor | Develop an Emergency Preparedness, Response and | Pre-construction Construction | cEO | Once, prior to the commencement of construction | Compliance with the Emergency Preparedness, |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-------------------------------|--------------------|--|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | Fire Management Plan specific to the project | | | and weekly during the construction phase | Response and Fire Management Plan |
| - All unattended open excavations must be adequately fenced or demarcated; | Contractor | Ensure that all excavations undertaken is fenced and demarcated within a reasonable timeframe and in instances where excavations will be open for long-periods of time | During the Construction Phase | cEO | Weekly | Excavations are fenced where required and photographic proof can be provided |
| - Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding; | Contractor | All staff must be easily identifiable and the climbing of towers and scaffolding must only be undertaken by authorised personnel as managed by the Contractor | During the construction phase | ECO | Monthly, and as and when required | No incidents of unauthorised climbing is reported |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|-------------------------------|--------------------|-----------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - Ensure structures vulnerable to high winds are secured; | Contractor | Ensure that sufficient stabilisation measures are implemented to secure structures vulnerable to high winds | During the construction phase | cEO | Weekly, and as and when required | No incidents of unstable structures due to high winds is reported |
| - Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged. | cEO | Compile and regularly update as incidents and complaints are submitted from the public and indicate the actions taken to resolve the complaint | During the construction phase | ECO | Monthly, and as and when required | The incidents and complaints register is complete and provides all the required details |

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; | Contractor | Mobile chemical toilets must be placed appropriately and in areas that avoid environmental sensitivities | During the Construction Phase | cEO | Weekly | Mobile toilets are installed and avoid environmental sensitivities |
| – 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 abluitions must be permitted under any circumstances; | Contractor in consultation with the cEO | All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement. | Pe-construction & Construction | ECO | Monthly, and as and when required | No evidence of non-compliance identified |
| – 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; | Contractor in consultation with the cEO | The installation of the toilets by the Contractor must be as per | During the Construction Phase | cEO | Weekly | No evidence of non-compliance identified |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|-------------------------------|--------------------|-----------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| <ul style="list-style-type: none"> 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; | | the listed requirements | | | | |
| <ul style="list-style-type: none"> - A copy of the waste disposal certificates must be maintained. | Contractor | Certificates obtained from the licensed waste disposal facility with the emptying of the toilets must be kept on file | During the Construction Phase | ECO | Monthly, and as and when required | Certificates for waste disposal from the licensed waste disposal facility available on site |

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; | Contractor | Only environmentally-friendly pest control must be used, when required | During the Construction Phase | ECO | As and when pest control is required for the project | Contractor to provide proof of pest control used being environmentally-friendly |
| – Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV/ AIDS; | cEO / Contractor in consultation with the ECO | The effects of sexually transmitted diseases and HIV/ AIDS must be covered in the Environmental Awareness Training | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and monthly during construction | Environmental awareness training material requirements checklist |
| – The Contractor must ensure that information posters on HIV/ AIDS are displayed in the Contractor Camp area; | Contractor | Develop and place information posters on HIV/ AIDS | During the Construction Phase | cEO | Weekly | Photographic evidence of poster placement |
| – Information and education relating to sexually transmitted diseases to be made available to both | cEO / Contractor in | Information and education of sexually | Pre-construction & Construction | ECO | Monthly | Environmental awareness training material |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|--|-------------------------------|--------------------|-------------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| construction workers and local community, where applicable; | consultation with the ECO | transmitted diseases must be covered in the Environmental Awareness Training. | | | | requirements checklist |
| - Free condoms must be made available to all staff on site at central points; | Contractor | Placement of free condoms in mobile toilets and at the construction camps | During the Construction Phase | ECO | Monthly | Proof of placement of free condoms by the contractor to be provided |
| - Medical support must be made available; | dEO / cEO in consultation with the Contractor | Ensure that designated personnel with first aid training are available on site and that first aid kits to provide medical support is readily available | Construction and Operations | ECO | Monthly | Check the availability of first aid trained personnel and medical kits (including if these are complete in terms of supplies) |
| - Provide access to Voluntary HIV Testing and Counselling Services. | Contractor | Compile a HIV testing schedule and provide counselling services where required | During the Construction Phase | ECO | Quarterly, and as and when required | Voluntary testing schedules and proof of counselling (where undertaken) |

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; | Contractor | Develop an Emergency Preparedness, Response and Fire Management Plan specific to the project | Pre-construction | ECO | Once, prior to the commencement of construction | Emergency Preparedness, Response and Fire Management Plan compiled |
| - The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation; | Contractor | Develop an Emergency Preparedness, Response and Fire Management Plan specific to the project which covers accidents, potential spillages and fires | Pre-construction | ECO | Once, prior to the commencement of construction | Emergency Preparedness, Response and Fire Management Plan includes required specifications |
| - All staff must be made aware of emergency procedures as part of environmental awareness training; | cEO / dEO in consultation with the ECO | Develop environmental awareness | Pre-construction | ECO | Prior to the commencement of the | Environmental awareness training material |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|---|---|------------------------------|--------------------|------------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | training material which covers the relevant emergency procedures | | | environmental awareness training | requirements checklist |
| – The relevant local authority must be made aware of a fire as soon as it starts; | Contractor in consultation with the ECO | Develop and include a procedure in the Emergency Preparedness, Response and Fire Management Plan for the event of a fire and the procedure to be followed for informing the local authority | Construction | ECO | As and when a fire occurs | The local authority was informed as per the relevant procedure set out in the Emergency Preparedness, Response and Fire Management Plan |
| – In the event of emergency, necessary mitigation measures to contain the spill or leak must be implemented (see Hazardous Substances section 5.17). | Contractor | Implement the required mitigation measures in the event of a spill or leak as per the requirements of Section 5.17. | Construction and Operations | ECO | As and when a spill or leak occurs | The mitigation measures included under Section 5.17 have been adhered to |

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; | cEO in consultation with the Contractor | Develop a strategy of how hazardous substances can be and should be minimised | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and monthly during the construction phase | Contractor to provide evidence of substances used for proof of compliance |
| - All hazardous substances must be stored in suitable containers as defined in the Method Statement; | Contractor | Develop a Method Statement for the storage of hazardous substances in suitable containers | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and monthly during the construction phase | Photographic proof that hazardous substances are stored in suitable containers as per the requirements of the relevant Method Statements |
| - Containers must be clearly marked to indicate contents, quantities and safety requirements; | Contractor | Where hazardous waste is stored these must be clearly marked | During the Construction Phase | ECO | Monthly | Photographic proof that containers are marked as per the requirements |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|-------------------------------|--------------------|---------------------------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | indicating the required details of the contents | | | | |
| – All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers; | Contractor | Ensure that storage areas are sufficiently bunded which are of sufficient capacity to contain a spill / leak from the stored containers | During the Construction Phase | ECO | Monthly during the Construction Phase | Photographic proof that storage areas are bunded and proof that the bund areas are of sufficient capacity to contain a spill / leak from the stored containers |
| – Bunded areas to be suitably lined with a SABS approved liner; | Contractor | Ensure that bunded storage areas are suitably lined | During the Construction Phase | ECO | Once, during the Construction Phase | Photographic proof that bunded storage areas are suitably lined |
| – An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis; | cEO / Contractor | Compile and update an Alphabetical Hazardous Chemical Substance (HCS) control sheet specific to the project | During the Construction Phase | ECO | Monthly, and as and when required | Complete and up to date control sheet provided by the Contractor |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|---------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS); | cEO / Contractor | Keep a record of all hazardous chemicals and the respective MSDS | During the Construction Phase | ECO | Monthly, and as and when required | Record of hazardous chemicals and the respective MSDS |
| - All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet; | cEO / Contractor | Provide training for personnel working with HCS | Pre-construction | ECO | Once, prior to the commencement of construction and as and when required | Record of training provided to personnel working with HCS |
| - 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; | cEO / Contractor | Develop environmental awareness training material which covers the relevant impacts and safety measures. Provide appropriate training and personal protective equipment for the relevant personnel handling hazardous | Pre-construction & Construction | ECO | Prior to the commencement of the environmental awareness training and monthly during the construction phase for personal protective equipment | Environmental awareness training material requirements checklist and all relevant personnel have undergone appropriate training and have access to personal protective equipment |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-------------------------------|--------------------|-----------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | substances and materials | | | | |
| – The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowzers; | Contractor | Appropriate storage facilities must be constructed or obtained for the storing of diesel, other liquid fuel, oil and hydraulic fluid | During the Construction Phase | ECO | Monthly, and as and when required | Storage tanks for the project are appropriate and no incidents are reported in this regard |
| – The tanks/ bowzers 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/ bowzers (110% statutory requirement plus an allowance for rainfall); | Contractor | Appropriate storage facilities must be constructed or obtained for tanks as per the requirements listed | During the Construction Phase | ECO | Monthly, and as and when required | Storage areas for the tanks/ bowzers for the project are appropriate and no incidents are reported in this regard |
| – The floor of the bund must be sloped, draining to an oil separator; | Contractor | Appropriate storage facilities must be constructed as per the requirements listed | During the Construction Phase | ECO | Once, during construction | Bunded storage areas are constructed according to the requirements |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-------------------------------|--------------------|-------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Provision must be made for refuelling 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; | Contractor | Appropriately constructed refuelling facility must be developed as per the requirements. Drip trays must be provided for use | During the Construction Phase | ECO cEO | Monthly Weekly | Soils at the refuelling facility are protected as required and drip trays are provided and used |
| – All empty externally dirty drums must be stored on a drip tray or within a bunded area; | Contractor | Ensure that empty dirty drums are stored appropriately as per the requirements | During the Construction Phase | ECO cEO | Monthly Weekly | Drip trays or bunded areas are used for the storage of dirty drums |
| – No unauthorised access into the hazardous substances storage areas must be permitted; | Contractor | Ensure through the implementation of procedures that no unauthorised access is undertaken into the storage areas | During the Construction Phase | ECO | Monthly | Proof of the implementation of the relevant procedure must be provided by the contractor |
| – No smoking must be allowed within the vicinity of the hazardous storage areas; | Contractor | Inform all employees of the requirement and develop | During the Construction Phase | ECO cEO | Monthly Weekly | Photographic record of the signage placed |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | and place relevant signage in the relevant areas | | | | must be provided |
| – Adequate fire-fighting equipment must be made available at all hazardous storage areas; | Contractor | Hazardous storage areas must be fitted with adequate fire-fighting equipment | During the Construction Phase | ECO | Monthly | Adequate fire-fighting equipment is available and has been serviced |
| – Where refuelling away from the dedicated refuelling station is required, a mobile refuelling unit must be used. Appropriate ground protection such as drip trays must be used; | Contractor | Provide a mobile refuelling unit as well as suitable ground protection, where required | During the Construction Phase | ECO | Monthly, and as and when required | A mobile refuelling unit and suitable ground protection is available for use |
| – 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; | Contractor | Provide an appropriate spill kit for the project for the use of hazardous substances | During the Construction Phase | ECO | Monthly, and as and when required | Appropriate spill kits are available for use |
| – The responsible operator must have the required training to make use of the spill kit in emergency situations; | cEO and Contractor | Provide training on the use of spill kits to the relevant employees | Pre-construction | ECO | Once, prior to the commencement of construction | Proof of training to be provided by the contractor |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|-------------------------------|--------------------|-----------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| <p>– An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken;</p> | cEO and Contractor | Provide an appropriate number of spill kits in relevant areas | During the Construction Phase | ECO | Monthly | Proof of appropriate number of spill kits in appropriate areas to be provided by the contractor |
| <p>– In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to Section 5.7 for procedures concerning storm and waste water management and 5.8 for solid and hazardous waste management.</p> | cEO and Contractor | Storage and disposal of contaminated soil must be in accordance with the National Environmental Management: Waste Act and sections 5.7 and 5.8 of this EMPr | During the Construction Phase | ECO | Monthly, and as and when required | Proof of storage and disposal in terms of the National Environmental Management: Waste Act must be provided. Certificates of disposal at licensed waste disposal facilities must be provided |

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; | Contractor | Demarcate specific areas for the maintenance of vehicles and equipment | During the Construction Phase | ECO | Monthly | A dedicated area for the maintenance of vehicles and machinery is used. |
| – 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. | Contractor | Ensure that a drip tray is available for an emergency repairs required | During the Construction Phase | ECO | Monthly | Contractor to provide evidence of drip tray use for emergency repairs |
| – Leaking equipment must be repaired immediately or be removed from site to facilitate repair; | Contractor | Ensure that where leaking equipment is identified it is repaired immediately or removed from site for repairs | During the Construction Phase | ECO | Monthly | Contractor to provide details of equipment repaired or removed from site |
| – Workshop areas must be monitored for oil and fuel spills; | cEO | Undertake regular inspections of the workshop | During the Construction Phase | ECO | Monthly | Register of inspection |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-------------------------------|--------------------|--|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | areas for oil and fuel spills and keep an updated register of inspection on site | | | | |
| – Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available; | Contractor | Provide an appropriate spill kit for the project | During the Construction Phase | ECO | Monthly, and as and when required | Appropriate spill kits are available for use |
| – 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; | Contractor | Ensure that the workshop area is sufficiently bunded in accordance with the required specification | During the Construction Phase | ECO | Once, during the Construction Phase and as and when required | Workshop area is bunded in accordance with the required specification |
| – Water drainage from the workshop must be contained and managed in accordance with Section 5.7: storm and waste water management. | Contractor | Ensure that water drainage from workshop area is managed as per the requirements of section 5.7 | During the Construction Phase | ECO | Monthly | Workshop drainage is managed in accordance with the requirements |

5.19 Batching plants

Impact management outcome: Minimise spillages and contamination of soil, surface water and groundwater.

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - Concrete mixing must be carried out on an impermeable surface; | Contractor | Provide impermeable surface for the mixing of concrete | During the Construction Phase | cEO | Weekly | No concrete mixing is undertaken on open ground |
| - Batching plants areas must be fitted with a containment facility for the collection of cement laden water. | Contractor | Implement measures for the control and management of cement laden water | During the construction phase | cEO | Weekly | No mismanagement of laden water due to the temporary concrete batching plant |
| - Dirty water from the batching plant must be contained to prevent soil and groundwater contamination | Contractor | Implement measures for the control and management of dirty water to prevent soil and groundwater contamination | During the construction phase | cEO | Weekly | No mismanagement of dirty water due to the temporary concrete batching plant and no/minimal soil and groundwater contamination |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|-------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains; | Contractor | Demarcate and provide a storage area for bagged cement in-line with the listed requirements | During the Construction Phase | cEO | Weekly | Photographic proof of bagged cement stored within the demarcated area |
| – A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted; | Contractor | Provide a washout facility for the washing of associated equipment. Enforce limitations on water use for washing of equipment | During the Construction Phase | cEO | Weekly | No cement laden water is released into the environment. Only minimal water is used for washing |
| – Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licensed disposal facility; | Contractor | Make use of hardened concrete where possible or dispose of concrete in a suitable manner | During the Construction Phase | ECO | Monthly | Certificates of disposal of concrete at licensed waste disposal facility |
| – Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site; | Contractor | Bind empty cement bags and temporarily store it in an appropriate area on site | During the Construction Phase | ECO | Monthly | Proof of binding of empty cement bags and storage in an appropriate area on site to be |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|---|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | provided by the Contractor |
| – Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to Section 5.20: Dust emissions) | Contractor | Ensure that sand and aggregates are kept damp or otherwise protected from dust generation | During the Construction Phase | ECO | Monthly | Proof of damping (or alternative dust suppression) of sand and aggregates must be provided by the Contractor |
| – 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; | Contractor | Ensure that all excess sand, stone and cement is removed or reused | At the completion of the Construction Phase | ECO | Once, with the completion of construction | Certificates for the disposal of sand, stone and cement at licensed waste disposal facilities or proof of reuse must be provided |
| – Temporary fencing must be erected around batching plants in accordance with Section 5.5: Fencing and gate installation. | Contractor | Erect Temporary fencing | During the construction phase | cEO | Weekly | Temporary fencing around batching plants |

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; | Contractor | Apply appropriate dust suppressant | During the Construction Phase | cEO | Weekly | Contractor to provide proof of use of appropriate dust suppressants |
| – 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; | Contractor | Proper planning for vegetation removal must be undertaken as well as for the associated rehabilitation | During the Construction Phase and Rehabilitation | cEO | Weekly | Plan for implementation must be provided by the Contractor |
| – Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present; | Contractor | Ensure that specific limitations are placed on the transport and handling of erodible materials during high wind conditions or when a visible | During the Construction Phase | cEO | Bi-weekly (every second week) | No complaints submitted in this regard |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|---|--|---------------------------------------|--|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | 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; | ECO | ECO to provide adequate recommendations | During the Construction Phase | Not Applicable | | |
| – Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind; | Contractor | Place soil stockpiles in areas less affected by wind | During the Construction Phase | cEO and ECO | Bi-weekly (every second week) Monthly | Soil stockpiles are not exposed to wind and have not been eroded |
| – Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO; | Contractor in consultation with the ECO | Contractor to implement erosion control measures as recommended and agreed with the ECO | During the Construction Phase | cEO | Weekly, until erosion is no longer a problem | Recommendations made by the ECO have been implemented by the Contractor |
| – Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas; | cEO / dEO / contractor | Inform all drivers of speed limits and place appropriate signage along the relevant roads | During the Construction Phase Operation Phase | ECO Operation and Maintenance team | Monthly | No complaints from community members are submitted |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|-------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Straw stabilisation must be applied at a rate of one bale/10 m ² and harrowed into the top 100 mm of top material, for all completed earthworks; | Contractor | Ensure that straw stabilisation is undertaken as per the listed requirements | During the Construction Phase | ECO | Monthly | Photographic record of all straw stabilisation undertaken |
| – For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust. | Contractor | Appropriate dust suppressant measures are implemented | During the Construction Phase | cEO | Weekly | Photographic record of measures being implemented and the results thereof |

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 | cEO / dEO / contractor | Ensure the contractor is suitably licensed with all necessary credentials and certifications | Pre-Construction Phase | ECO/EO | Once off, before blasting activities commence. | ECO/EO to check all valid credentials and certifications on hand. |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|------------------------|---|------------------------------|--------------------|--|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site. | cEO / dEO / contractor | Ensure all responsible personnel have been notified of blasting activities 24 hours in advance and keep records of notifications. | Pre-Construction Phase | ECO/EO | Once off, before blasting activities commence. | ECO/EO to confirm all necessary personnel have been notified. Notification records to be provided. |

5.22 Noise

Impact Management outcome: Unnecessary noise is prevented by ensuring that noise from construction activities is mitigated.

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|-------------------------------|--------------------|-----------------------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – The Contractor must keep noise level within acceptable limits. Restrict the use of sound amplification equipment for communication and emergency only; | Contractor | Ensure that noise limits do not exceed acceptable limits and avoid the use of amplification communication | During the Construction Phase | ECO | Monthly, and as and when required | No complaints registered in this regard. No amplification equipment is used. |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|---|--|-----------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained; | Contractor | Provide and implement silencing technology | During the Construction Phase | ECO | Monthly, and as and when required | No complaints registered in this regard. Silencing technology is utilised. |
| – Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers; | cEO | Update complaints register. Provide daily transport to and from site for employees | During the Construction Phase | ECO | Monthly, and as and when required | Complaints register provided by the cEO and proof of transportation services provided |
| – 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. | cEO and Contractor in consultation with the ECO | Compile a Code of Conduct for staff. Appropriate operating hours must be identified for the project. | Pre-construction and Construction | ECO | Once, prior to the commencement of construction | No complaints registered in this regard. |

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; | c | Identify and demarcate through signage designated smoking areas | Pre-construction & Construction | ECO | Monthly | Photographic record of designated smoking area |
| – Firefighting equipment must be available on all vehicles located on site; | cEO / dEO in consultation with the Contractor | Provide all vehicles with firefighting equipment | Construction | ECO | Monthly | All vehicles are fitted with firefighting equipment and the details thereof are provided by the cEO |
| – The local Fire Protection Agency (FPA) must be informed of construction activities; | cEO in consultation with the ECO | Undertake formal consultation to inform the local FPA of the associated construction activities | Pre-construction | ECO | Once, during the commencement of the Construction Phase | Proof of consultation with the FPA |
| – Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site; | dEO / cEO / Contractor in | Develop environmental awareness | Pre-construction & Construction | ECO | Prior to the commencement of the | Environmental awareness training material |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|---------------------------|---|------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | consultation with the ECO | <p>training material which covers the contact numbers for the FPA and emergency services.</p> <p>Place the contact numbers for the FPA and emergency services at a visible and central location</p> | | | environmental awareness training and once during the construction phase | requirements checklist and photographic record of contact numbers on display |
| - Two-way swop of contact details between ECO and FPA. | ECO | Consultation between the ECO and FPA to exchange contact details | Pre-construction | Not Applicable | | |

5.24 Stockpiling and stockpile areas

Impact management outcome: Erosion and sedimentation as a result of stockpiling are reduced.

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|---------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to minimise impacts to watercourses, wetlands and water bodies; | Contractor | Identify and demarcate an appropriate location for the storage of excavated materials | Pre-construction & Construction | ECO | Monthly | Excavated material is not stored within sensitive environmental areas |
| – All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods; | Contractor | Implement appropriate and sufficient maintenance on stockpiled material regularly | During the Construction Phase | cEO ECO | Bi-weekly (every second month) Monthly | Stockpiled material is maintained sufficiently and is clear of weeds and alien vegetation |
| – Topsoil stockpiles must not exceed 2 m in height; | Contractor | Enforce limitations for the height of topsoil stockpiles | During the Construction Phase | cEO ECO | Bi-weekly (every second month) Monthly | Topsoil stockpiles do not exceed 2m in height |
| – During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.); | Contractor | Appropriate material must be provided in order to cover stockpiles when required | During the Construction Phase | ECO | Monthly | Contractor to provide proof of availability of appropriate material to |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|-------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | cover stockpiles when required |
| – Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material. | Contractor | Sandbags must be provided in order to prevent erosion of stockpiled materials | During the Construction Phase | ECO | Monthly | Contractor to provide proof of availability of sandbags to prevent erosion of stockpiled materials |

5.25 Finalising tower positions

Impact management outcome: No environmental degradation occurs as a result of the survey and pegging operations.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – No vegetation clearing must occur during survey and pegging operations; | Contractor | Implement restrictions in terms of vegetation clearing during the survey and pegging operations | Pre-construction | cEO | Weekly | Contractor to provide photographic proof that no vegetation has been cleared |
| – No new access roads must be developed to facilitate access for survey and pegging purposes; | Contractor | Restrict the development of | Pre-construction | cEO | Weekly | Contractor to provide |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|---|--|------------------------------|--------------------|--|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | new access roads for survey and pegging purposes | | | | photographic proof that no new roads have been developed |
| – Project manager, botanical specialist and contractor to agree on final tower positions based on survey within assessed and approved areas; | DPM, Suitably Qualified Specialist and Contractor | Undertake consultation between the relevant responsible people and finalise the tower positions for the power line | Pre-construction | ECO | Once the final tower positions have been finalised and agreed upon | Provision of final tower positions to the ECO |
| – The surveyor is to demarcate (peg) access roads/tracks in consultation with ECO. No deviations will be allowed without the prior written consent from the ECO. | Surveyor in consultation with the ECO | Undertake consultation between the surveyor and the ECO | Pre-construction | cEO | Weekly | Consultation with the ECO regarding the distribution of pegs. |

5.26 Excavation and Installation of foundations

Impact management outcome: No environmental degradation occurs as a result of excavation or installation of foundations.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|---------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a recognised disposal site, if not used for backfilling purposes; | Contractor | Use a licensed waste disposal facility for the disposal of excess spoil | During the Construction Phase | ECO | Monthly | Certificates obtained for the disposal of excess spoil at a licensed waste disposal facility |
| – Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes; | Contractor | Spoil used for landscaping must be applied as per the listed requirements | Construction and Rehabilitation | ECO | Monthly | Photographic record of spoil used for landscaping purposes as well as feedback from the contractor |
| – Management of equipment for excavation purposes must be undertaken in accordance with Section 5.18: Workshop equipment maintenance and storage; and | Contractor | Undertake the management of equipment for excavation as per the requirements of section 5.18 | During the Construction Phase | ECO | Monthly | Management of equipment is undertaken in line with the requirements of section 5.18 |
| – Hazardous substances spills from equipment must be managed in accordance with Section 5.17: Hazardous substances. | Contractor | Undertake the management of hazardous | During the Construction Phase | ECO | Monthly | Management of hazardous substances spills |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|-------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | substances spills from equipment as per the requirements of section 5.17 | | | | from equipment is undertaken in line with the requirements of section 5.17 |
| – Batching of cement to be undertaken in accordance with Section 5.19: Batching plants; | Contractor | Ensure correct batching of cement | During the construction phase | cEO | Weekly | Measures in place to ensure the batching of cement is done in accordance with Section 5.19: Batching plants |
| – Residual cement must be disposed of in accordance with Section 5.8: Solid and hazardous waste management. | Contractor | Undertake the disposal of residual cement as per the requirements of section 5.8 | During the Construction Phase | ECO | Monthly | The disposal of residual cement is undertaken in line with section 5.8. |

5.27 Assembly and erecting towers

Impact management outcome: No environmental degradation occurs as a result of assembly and erecting of towers.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|--|---------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Prior to erection, assembled towers and tower sections must be stored on elevated surfaces (suggest wooden blocks) to minimise damage to the underlying vegetation; | Contractor | Provide the necessary materials for the elevated surface, where towers are to be placed on indigenous vegetation | During the Construction Phase | cEO | Weekly | Implementation of elevated surface and photographic record thereof |
| – In sensitive areas, tower assembly must take place off-site or away from sensitive positions; | Contractor in consultation with the cEO and the ECO | Identify sensitive areas to be avoided by tower assembly and ensure that the areas are not infringed upon | Pre-construction & Construction | cEO | Weekly | Tower assembly is undertaken outside of sensitive areas |
| – The crane used for tower assembly must be operated in a manner which minimises impact to the environment; | Contractor in consultation with the cEO and the ECO | Ensure that no impact to the environment is imposed during the operation of the crane | Pre-construction & Construction | cEO | Weekly | No environmental damages incurred as a result of the crane. |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|--|---------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - The number of crane trips to each site must be minimised; | Contractor in consultation with the cEO and the ECO | Ensure that the utilisation of the crane is maximised when on site. | Pre-construction & Construction | cEO | Weekly | Few crane trips to each site observed. |
| - Wheeled cranes must be utilised in preference to tracked cranes. However, Rocky terrain may require tracked cranes in the project site. | Contractor | Ensure wheeled cranes are utilised, where practical. | Pre-construction & Construction | cEO | Weekly | Wheeled cranes observed on site. |
| - Consideration must be given to erecting towers by helicopter or by hand where it is warranted to limit the extent of environmental impact; | Contractor | Contractor to undertake erecting of towers in an environmentally acceptable manner | During the Construction Phase | ECO | Monthly | No unacceptable environmental impacts occur with the erecting of the towers |
| - Access to tower positions to be undertaken in accordance with access requirements specified in Section 5.4: Access Roads; | Contractor | Undertake access to tower positions as per the requirements of section 5.4 | During the Construction Phase | ECO | Monthly | Access to tower positions are undertaken as per the requirements of section 5.4 |
| - Vegetation clearance to be undertaken in accordance with general vegetation clearance requirements specified in Section 5.10: Vegetation clearing; | Contractor | Undertake vegetation clearance as per the requirements of section 5.10 | During the Construction Phase | cEO | Weekly | Vegetation clearance is undertaken as per the requirements of section 5.10 |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|--|---------------------------------|--------------------|-----------------------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – No levelling at tower sites must be permitted unless approved by the Development Project Manager or Developer Site Supervisor; | Contractor in consultation with the DPM and DSS | Written permission for levelling at tower sites, if required, must be obtained from the DPM and DSS prior to the undertaking of any levelling activities | During the Construction Phase | ECO | Monthly, and as and when required | Written permission from the DPM and DSS provided to the Contractor |
| – Topsoil must be removed separately from subsoil material and stored for later use during rehabilitation of such tower sites; | Contractor | Implement appropriate measures to ensure that topsoil is removed from subsoil material | Construction and Rehabilitation | cEO | Weekly, and as and when required | Proof of appropriate measures implemented must be provided by the Contractor |
| – Topsoil must be stored in heaps not higher than 2m to prevent destruction of the seed bank within the topsoil; | Contractor | Implement the listed requirements for the storage of topsoil | During the Construction Phase | cEO | Weekly | Topsoil is stored as per the listed requirements |
| – Excavated slopes must be no greater than 1:3, but where this is unavoidable, appropriate measures must be undertaken to stabilise the slopes; | Contractor | Implement the listed requirements for the excavation of slopes | During the Construction Phase | cEO | Weekly | Excavation of slopes is undertaken as per the listed requirements |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|---|---|---------------------------------|--------------------|--|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Fly rock from blasting activity must be minimised and any pieces greater than 150 mm falling beyond the Working Area, must be collected and removed; | cEO / dEO / contractor | Ensure all pieces greater than 150 mm falling beyond the Working Area, are collected and removed and implement measures to try and minimise fly rock from blasting activity | Pre-Construction Phase | ECO/EO | During blasting activities | ECO/EO to confirm necessary measures have been undertaken to minimise fly rock from blasting activity and that no pieces greater than 150 mm are beyond the working area. |
| – Only existing disturbed areas are utilised as spoil areas; | Contractor in consultation with the ECO | Identify, demarcate and use existing disturbed areas for spoil areas | Pre-construction & Construction | cEO | Weekly | Only identified disturbed areas are used as spoil areas |
| – Drainage is provided to control groundwater exit gradient with the spill areas such that migration of fines is kept to a minimum; | Not Applicable | | | | | |
| – Surface water runoff is appropriately channelled through or around spoil areas; | DPM and Contractor | Design and implement appropriate surface runoff measures for spoil areas | Pre-construction & Construction | ECO | Once, during the construction of the surface runoff measures | Implementation of surface runoff measures through and/or around spoil areas |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|---------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| <ul style="list-style-type: none"> - During backfilling operations, care must be taken not to dump the topsoil at the bottom of the foundation and then put spoil on top of that; | Contractor | Develop and implement backfilling procedures which ensures that topsoil is not placed at the bottom of foundations. | Pre-construction & Construction | cEO | Weekly | Backfilling operations are undertaken as per the procedures developed |
| <ul style="list-style-type: none"> - The surface of the spoil is appropriately rehabilitated in accordance with the requirements specified in Section 5.29: Landscaping and rehabilitation; | Contractor | Rehabilitation of the surface spoil must be undertaken in accordance with the requirements of section 5.29 | Rehabilitation | cEO | Weekly | Rehabilitation of the surface spoil is undertaken as per the requirements of section 5.29 |
| <ul style="list-style-type: none"> - The retained topsoil must be spread evenly over areas to be rehabilitated and suitably compacted to effect re-vegetation of such areas to prevent erosion as soon as construction activities on the site is complete. Spreading of topsoil must not be undertaken, where possible, at the beginning of the dry season. | Contractor | Ensure that topsoil is spread evenly and compacted appropriately. This must be undertaken outside of the start of the dry season, where possible | Rehabilitation | cEO | Weekly | Proof that topsoil has been spread evenly and compacted correctly must be provided by the Contractor/cEO. Proof that the activities were undertaken outside of the start of the dry |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---------------------------|--------------------|--------------------------|------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | season (or motivation as to why this was not possible) must be provided by the Contractor |

5.28 Stringing

Impact management outcome: No environmental degradation occurs as a result of stringing.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|---|---------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| <ul style="list-style-type: none"> Where possible, previously disturbed areas must be used for the siting of winch and tensioner stations. In all other instances, the siting of the winch and tensioner must avoid Access restricted areas and other sensitive areas; | Contractor in consultation with the ECO | Identify and demarcate areas appropriate for the siting of winch and tensioner stations which does not infringe on access restricted areas or | Pre-construction & Construction | cEO | Weekly | Winch and tensioner stations are located outside of identified sensitive areas |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|---------------------------------|-------------------------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | environmentally sensitive areas | | | | |
| – The winch and tensioner station must be equipped with drip trays in order to contain any fuel, hydraulic fuel or oil spills and leaks; | Contractor | Provide sufficient drip trays | During the Construction Phase | cEO | Weekly | Sufficient drip trays are available for the winch and tensioner stations and no spills occur |
| – Refuelling of the winch and tensioner stations must be undertaken in accordance with Section 5.17: Hazardous substances; | Contractor | The refuelling of winch and tensioner stations must be undertaken as per the requirements of section 5.17 | During the Construction Phase | ECO | Monthly | The refuelling of winch and tensioner stations is undertaken as per the requirements of section 5.17 |
| – In the case of the development of transmission and distribution infrastructure, a one metre "trace-line" may be cut through the vegetation for stringing purposes only and no vehicle access must be cleared along "trace-lines". Vegetation clearing must be undertaken by hand, using chainsaws and handheld implements, with vegetation being cut off at ground level. No tracked or wheeled mechanised equipment must be used; | Contractor | Develop and implement procedures for implementation for vegetation clearing during stringing in line with the specification. | Pre-construction & Construction | ECO and cEO weekly during stringing | Once, prior to the commencement of construction and weekly during stringing | Implementation of the procedures put in place and proof thereof from the Contractor |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--|--|---------------------------------|--------------------|-----------------------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Alternative methods of stringing which limit impact to the environment must always be considered e.g. by hand or by using a helicopter; | Contractor | Identify and implement the stringing method with the least environmental impact | During the Construction Phase | cEO | Weekly | Implementation of identified method of stringing with the least environmental impact |
| – Where the stringing operation crosses a public or private road or railway line, the necessary scaffolding/ protection measures must be installed to facilitate access. If, for any reason, such access has to be closed for any period(s) during development, the persons affected must be given reasonable notice, in writing; | Contractor | Identify prior to construction areas where protection measures will be required during stringing. Where access is to be restricted timeous written notice must be provided to the affected parties | Pre-construction & Construction | ECO | Monthly, and as and when required | Proof of implementation of protection measures and proof of written notice to affected parties must be provided by the Contractor |
| – No services (electrical distribution lines, telephone lines, roads, railways lines, pipelines fences etc.) must be damaged because of stringing operations. Where disruption to services is unavoidable, persons affected must be given reasonable notice, in writing; | Contractor in consultation with the cEO, DPM and dEO | Avoid the damaging or disturbance of existing services. Where services will be disrupted timeous notice must be provided to the affected parties | During the Construction Phase | ECO | Monthly, and as and when required | No disruption of services occurs. Where disruption occurs proof of written notice to affected parties must be provided by the Contractor |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--------------------------|------------------------------|--------------------|-----------|------------------------|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - Where stringing operations cross cultivated land, damage to crops is restricted to the minimum required to conduct stringing operations, and reasonable notice (10 work days minimum), in writing, must be provided to the landowner; | Not Applicable | | | | | |
| - Necessary scaffolding protection measures must be installed to prevent damage to the structures supporting certain high value agricultural areas such as vineyards, orchards, nurseries. | Not Applicable | | | | | |

5.29 Socio-economic

Impact management outcome: Socio-economic development is enhanced.

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|---------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - Develop and implement communication strategies to facilitate public participation; | dEO / cEO | Identify and implement appropriate strategies for communication with the communities through consideration of | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and monthly during the construction | Communication is undertaken as per the identified strategies and no complaints are submitted regarding communication |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|---------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | the community needs | | | | |
| - Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process; | Contractor | Development and implement a Grievance Mechanism which considers the community needs and provides procedures for conflict resolution | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and monthly during the construction phase | Conflict resolution is undertaken in line with the requirements of the Grievance Mechanism. No complaints on conflict resolution is submitted by the community |
| - Sustain continuous communication and liaison with neighbouring owners and residents | Contractor | Development and implement a Grievance Mechanism that provides procedures for communication / liaison with neighbouring landowners and residents | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and monthly during the construction phase | Communication / liaison with neighbouring landowners and residents are undertaken in line with the requirements of the Grievance Mechanism. No complaints on communication with neighbouring landowners and |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|---------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | | | | | residents is submitted |
| – Create work and training opportunities for local stakeholders; and | Contractor | Develop and implement a “locals first” policy for the provision of employment opportunities | Pre-construction & Construction | ECO | Once, prior to the commencement of construction and monthly during the construction phase | The “locals first” policy is considered in terms of the employment and training opportunities |
| – Where feasible, no workers, with the exception of security personnel, must be permitted to stay overnight on the site. This would reduce the risk to local farmers. | Contractor | Ensure no workers are permitted to stay over night on the site | Construction | ECO | Throughout construction | No workers remaining on site over night |

5.30 Temporary closure of site

Impact management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|-------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in sections 5.17: | Contractor | Regular emptying of the bunds must be undertaken. This | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Bunds are emptied as per the requirements listed under |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-------------------------------|--------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| management of hazardous substances and 5.18 workshop, equipment maintenance and storage; | | must be undertaken as per the requirements listed in sections 5.17 and 5.18 | | | | sections 5.17 and 5.18 |
| - Hazardous storage areas must be well ventilated; | Contractor | Install appropriate ventilation in all hazardous storage areas | During the construction phase | ECO | Prior to site closure for more than 05 days | Effective ventilation is installed in hazardous storage areas |
| - Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service; | Contractor / cEO | Ensure fire extinguishers are serviced, as required and are easily accessible with appropriate signage indicating location. Ensure service records are kept up to date and filed | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Signage placed indicating location of fire extinguishers and service records |
| - Emergency and contact details must be displayed; | Contractor / cEO | Place emergency and contact details which are readily available and easily accessible | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Photographic proof of contact details on display |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|--|---------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel; | Contractor in consultation with the ECO | Hold a workshop with all security personnel to provide a brief of the project and security requirements. Provide facilities in order to contact management and emergency personnel | Pre-construction & construction | ECO | Prior to site closure for more than 05 days | Proof of the workshop held must be kept on file by the contractor. |
| – Night hazards such as reflectors, lighting, traffic signage etc. must have been checked; | Contractor | Regular checks of night hazards must be undertaken | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Proof of checks of night hazards must be provided by the contractor |
| – Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.; | cEO / Contractor in consultation with the ECO | Identify any potential fire hazards and notify the relevant local authority | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Proof of notification of the fire hazards to the local authority must be provided by the Contractor |
| – Structures vulnerable to high winds must be secured; | Contractor | Ensure structures vulnerable to wind are secure prior to site closure | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Structures vulnerable to wind are secured prior to site closure |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|-------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - Wind and dust mitigation must be implemented; | Contractor | Implement wind and dust mitigation prior to site closure | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Wind and dust mitigation is implemented prior to site closure |
| - Cement and materials stores must have been secured; | Contractor | Ensure cement and material stores are secured prior to site closure | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Cement and material stores are secured prior to site closure |
| - Toilets must have been emptied and secured; | Contractor | Ensure toilets are emptied and secured prior to site closure | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Toilets are emptied and secured prior to site closure |
| - Refuse bins must have been emptied and secured; | Contractor | Ensure refuse bins are emptied and secured prior to site closure | During the Construction Phase | ECO | Prior to site closure for more than 05 days | refuse bins are emptied and secured prior to site closure |
| - Drip trays must have been emptied and secured. | Contractor | Ensure drip trays are emptied and secured prior to site closure | During the Construction Phase | ECO | Prior to site closure for more than 05 days | Drip trays are emptied and secured prior to site closure |

5.31 Landscaping and rehabilitation

Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|---|--|-----------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed to a registered waste site and certificates of disposal provided; | Contractor | Develop and implement a rehabilitation plan for the rehabilitation of all disturbed areas. Dispose of all spoil and waste at a licensed waste disposal facility | Pre-construction & Rehabilitation | cEO | Weekly | Rehabilitation of the disturbed areas is undertaken as per the rehabilitation plan. All certificates of waste disposal at licensed facilities are available. |
| - 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 | Contractor in consultation with the ECO | Assess all slopes and determine whether contouring is required | Rehabilitation | cEO | Weekly | All slopes are assessed and contoured as required |
| - 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; | Contractor in consultation with the ECO | Assess all slopes and determine whether terracing is required | Rehabilitation | cEO | Weekly | All slopes are assessed and terraced as required |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – 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; | Contractor | Ensure all berms have a slope of 1:4 and is replanted with indigenous species and grasses | Rehabilitation | cEO | Weekly | All berms have a slope of 1:4 and is replanted with indigenous species and grasses |
| – 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; | Not applicable | | | | | |
| – Rehabilitation of tower sites and access roads outside of farmland; | Not applicable | | | | | |
| – Indigenous species must be used for with species and/grasses to where it compliments or approximates the original condition; | Contractor | Make use of indigenous species for rehabilitation | Rehabilitation | cEO | Weekly | Indigenous species are used for rehabilitation |
| – Stockpiled topsoil must be used for rehabilitation (refer to Section 5.24: Stockpiling and stockpiled areas); | Contractor | Ensure stockpiled topsoil is used as per the requirements listed under section 5.24 | Rehabilitation | cEO | Weekly | Stockpiled topsoil is used as per the requirements listed under section 5.24 |
| – Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion; | Contractor | Ensure that topsoil is spread evenly | Rehabilitation | cEO | Weekly | Topsoil is spread evenly |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-----------------------------------|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed; | Contractor | Remove all visible weeds from placement area and topsoil before spreading the topsoil | Rehabilitation | cEO | Weekly | No weeds are visible in the placement area or the topsoil |
| – Subsoil must be ripped before topsoil is placed; | Contractor | Undertake the ripping of subsoil prior to the spreading of topsoil | Rehabilitation | cEO | Weekly | Subsoil is ripped before topsoil is placed |
| – The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment; | Contractor | Plan the timeframe for rehabilitation in order to undertake vegetation planting during the optimal time for vegetation establishment | Rehabilitation | ECO | At the start of rehabilitation to confirm correct timeframe | Rehabilitation is undertaken during the optimal time |
| – Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; | Contractor | All disturbed slope areas must be stabilised | Rehabilitation | cEO | Weekly | Disturbed slopes are stabilised sufficiently |
| – Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design | Contractor | Stabilise slopes as per the design specifications | Pre-construction & Rehabilitation | cEO | Weekly | Slopes are stabilised as per the design specifications |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|---|------------------------------|--------------------|----------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| 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. | Contractor | Spoil used for landscaping must be applied as per the listed requirements | Rehabilitation | cEO | Weekly | Photographic record of spoil used for landscaping purposes as well as feedback from the contractor |
| – 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 | Contractor in consultation with a suitably qualified specialist | Make use of a suitable vegetation seed mixture should enhancement be required | Rehabilitation | ECO | As and when required | Use of a suitable vegetation seed mixture if required |

6 ACCESS TO THE EMPr

Once completed and signed, to allow the public access to the 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.

7 SITE SPECIFIC INFORMATION AND DECLARATION

7.1 Sub-section 1: contact details and description of the project

7.1.1 Details of the applicant:

Name of applicant: Freegold Harmony (Pty) Ltd

Contact person: Thomas Wilson

Tel No: 072 424 9045

Postal Address: P O Box 2, Randfontein, 1760 Johannesburg, South Africa

Physical Address: Randfontein Office Park, Cnr Main Reef Road and Ward Avenue, Randfontein, 1759

7.1.2 Details and expertise of the EAP:

Name of EAP: Jo-Anne Thomas

Tel No: 011 656 3237

Fax No: 086 684 0547

E-mail address: joanne@savannahsa.com

Expertise of the EAP (Curriculum Vitae included): Refer to Appendix 2 of this EMPr for a CV of the EAP

7.1.3 Project name: 18MW Harmony Joel Solar PV Facility, Free State Province

7.1.4 Description of the project:

Freegold Harmony (Pty) (a subsidiary of Harmony Gold Mining Company Ltd) is looking to supplement its energy supply by implementing photovoltaic (PV) generation at their Mine site, aiding their transition to a more sustainable and environmentally friendly energy mix at the existing Harmony Joel Mine. A solar PV facility with a generating capacity of 18MW is proposed in close proximity to the Harmony Joel mining operations. The site is located 900m north east of the Harmony Joel operations, approximately ~20km north east of the town of Theunissen within the Masilonyana Local Municipality and within the Lejweleputswa District Municipality, Free State Province.

The solar PV facility, known as Harmony Joel Solar PV Facility, will comprise of several arrays of PV panels and associated infrastructure. The project site is located on Portion 0 of the Farm Leeuwbult 580, which are owned by the Mine but outside of the mining area (the project would not impact on mining activities).

A project site considered to be technically suitable for the development of the solar PV facility, with an extent of approximately 1000ha, was identified by Freegold Harmony (Pty) Ltd. A development area of ~220ha was demarcated within the project site for the construction and operation of the Harmony Joel Solar PV Facility and its associated infrastructure, and the full extent of this development area is assessed within this EIA Report. The development area

allows an adequate footprint (~47ha) for the installation of a solar PV facility with a contracted capacity of up to 18MW, while allowing for the avoidance of environmental site sensitivities.

The grid connection for the facility will consist of underground cabling within the facility, an on-site facility substation and switching station to be connected to the existing Shafts 1 & 2 HJ Joel Mining Substation via a power line (located ~830m south west of the development footprint). The grid connection infrastructure is located within an assessment corridor of 300m wide and traverses Portion 0 of the Farm Leeuwbult 580.

The Harmony Joel Solar PV Facility will have a contracted capacity of up to 18MW and will include specific infrastructure, namely:

- » PV modules and mounting structures
- » Inverters and transformers a SCADA room, and maintenance room
- » Cabling between the project components, to be laid underground where practical
- » Access roads, internal roads and fencing around the development area.
- » Temporary and permanent laydown areas and O&M buildings.
- » Grid connection solution including an on-site facility substation, switching station, to be connected to the Shafts 1 & 2 HJ Joel Mining Substation via an overhead power line (located ~830m south west of the development footprint).

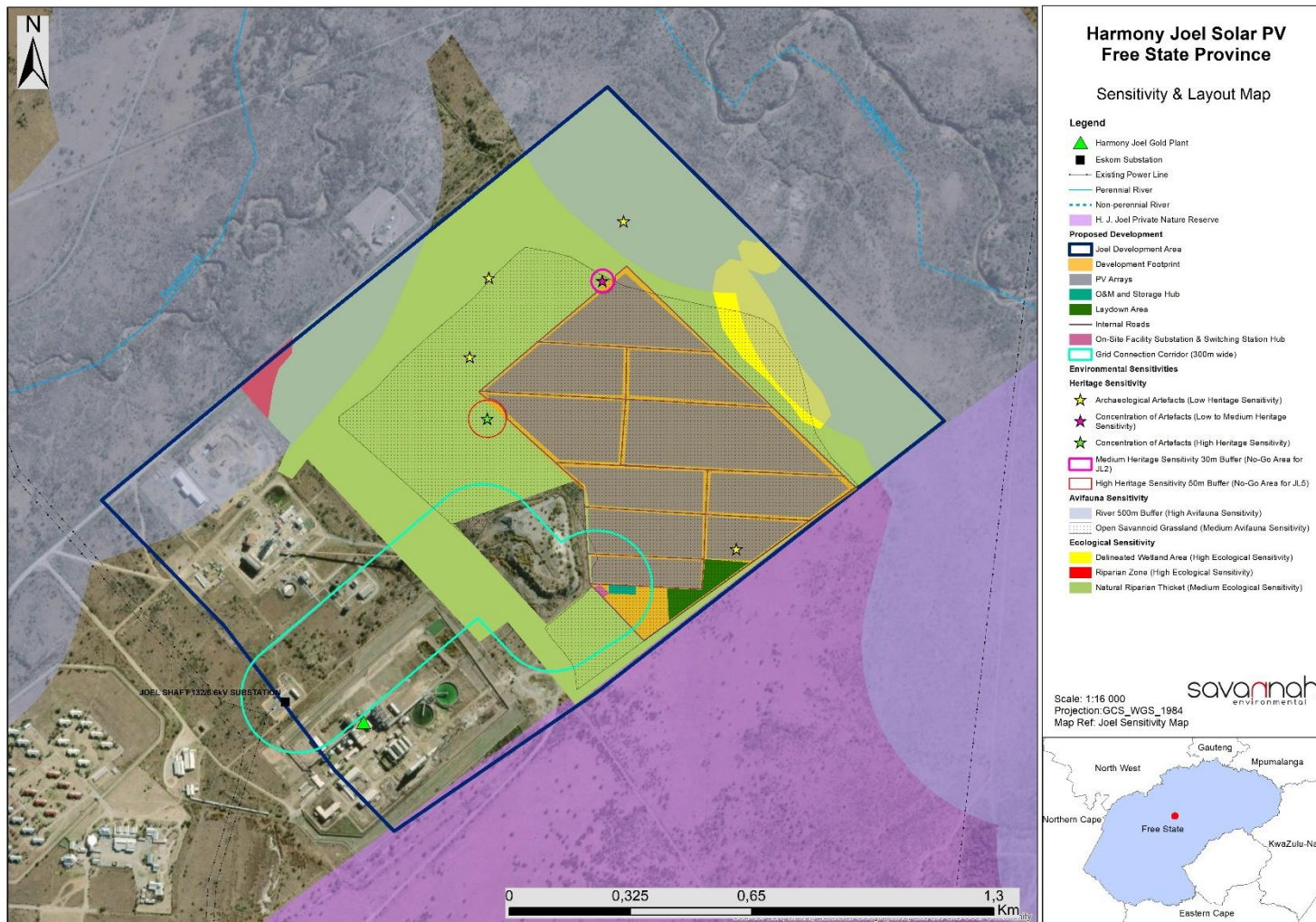


Figure 1: Layout and sensitivity map of the development footprint and grid connection corridor for the 18MW Harmony Joel Solar PV Facility, as was assessed as part of the BA process.

7.2 Sub-section 2: Development footprint site map

This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout. The sensitivity map must be prepared from the national web based environmental screening tool, when available for compulsory use at: <https://screening.environment.gov.za/screeningtool>. The sensitivity map shall identify the nature of each sensitive feature e.g., raptor nest, threatened plant species, archaeological site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features in the surrounding landscape. The transmission and distribution profile shall be illustrated at an appropriate resolution to enable fine scale interrogation. It is recommended that <20 km of transmission and distribution length is illustrated per page in A3 landscape format. Where considered appropriate, photographs of sensitive features in the context of tower positions shall be used.

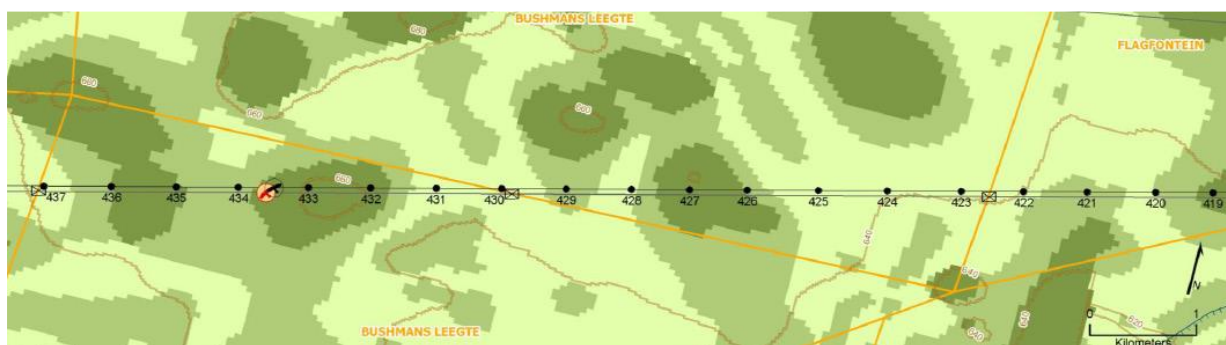


Figure 2: Example of an environmental sensitivity map in the context of a final transmission and distribution profile

Figure 1: Layout and sensitivity map of the development footprint and grid connection corridor for the 18MW Harmony Joel Solar PV Facility, as was assessed as part of the EIA process (A3 map is included in Appendix L).

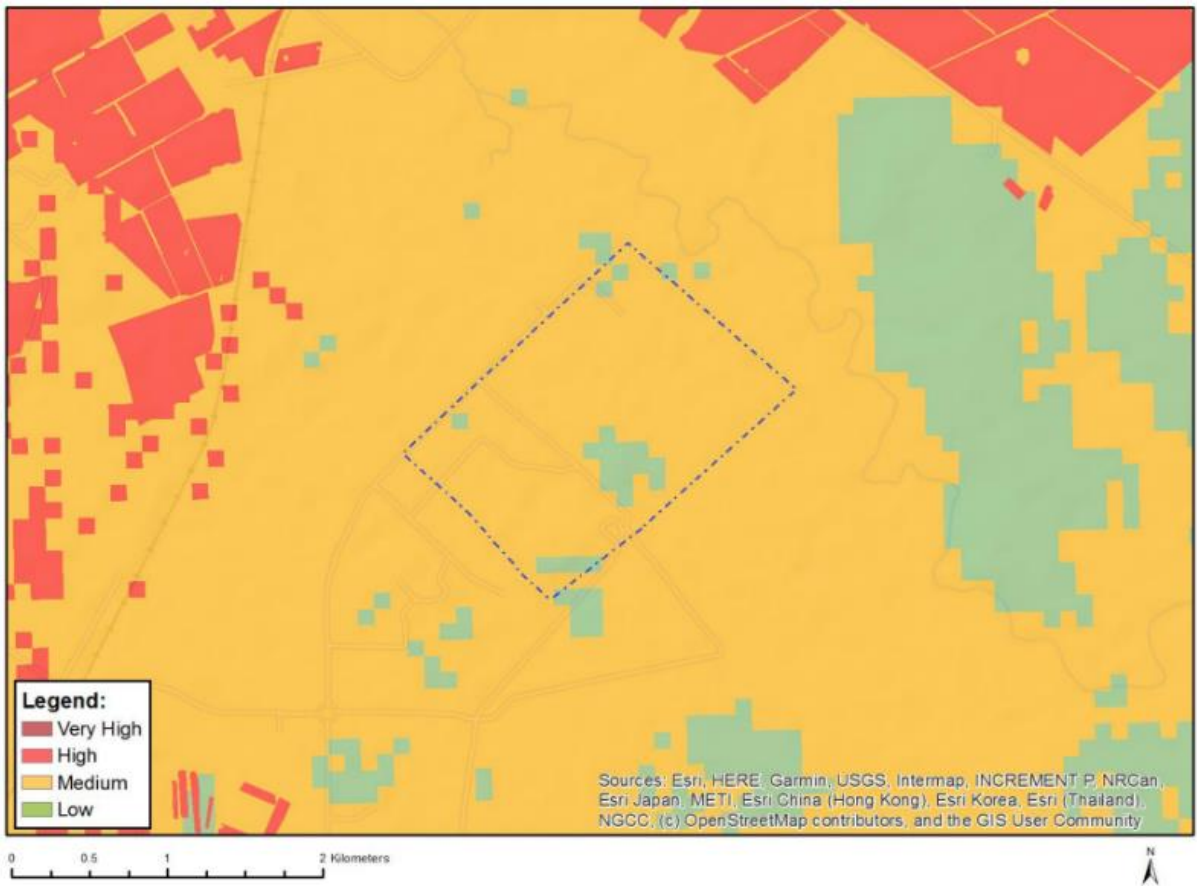


Figure 3: Map of relative agriculture theme sensitivity

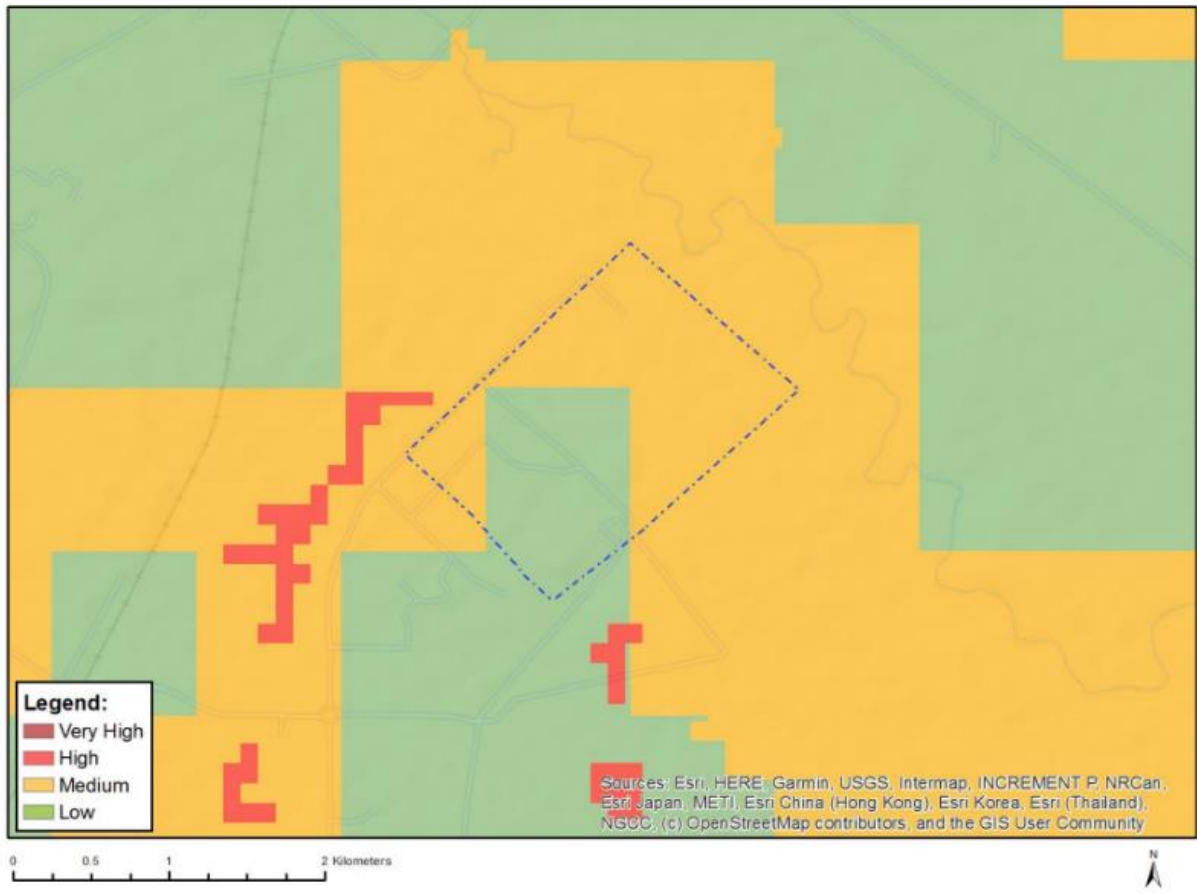


Figure 4: Map of relative animal species theme sensitivity



Figure 5: Map of relative aquatic biodiversity theme sensitivity



Figure 6: Map of relative archaeological and cultural heritage theme sensitivity.



Figure 7: Map of relative avian theme sensitivity

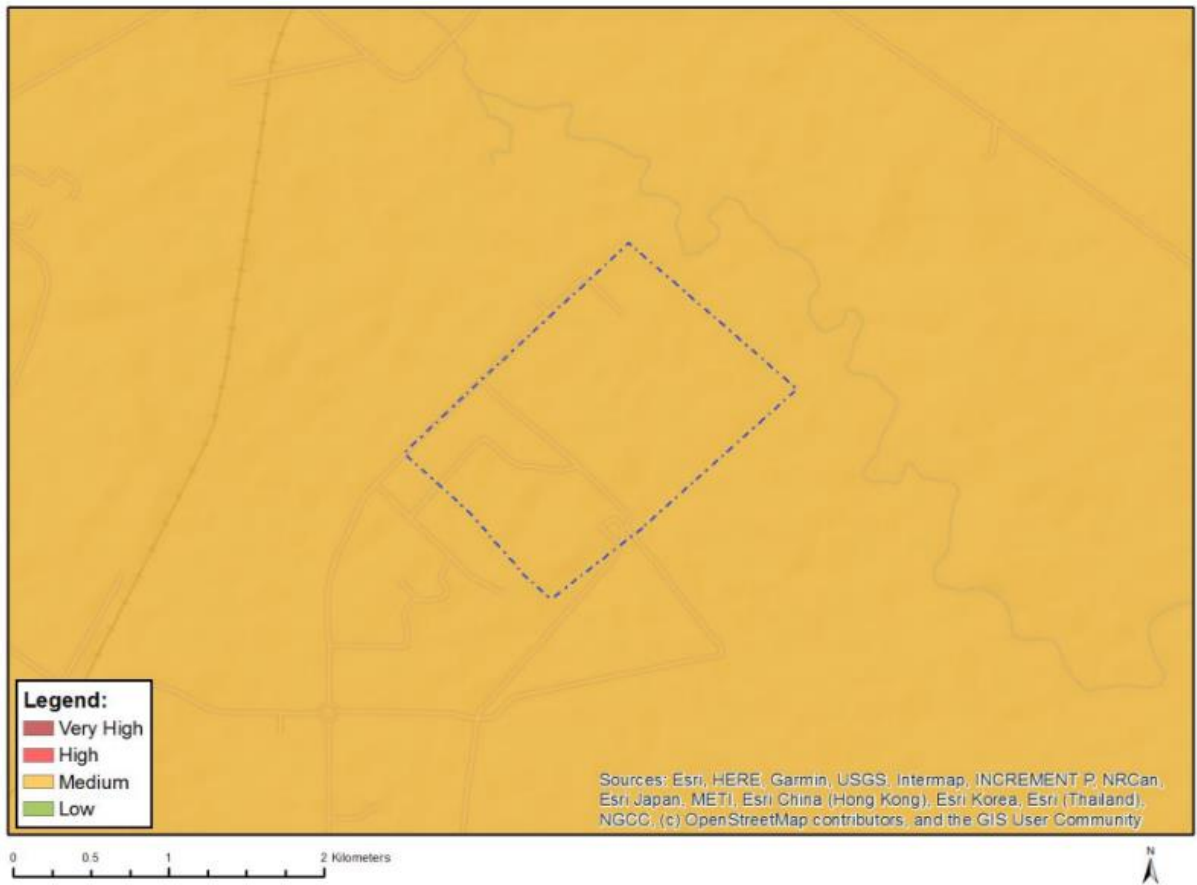


Figure 8: Map of relative civil aviation theme sensitivity



Figure 9: Map of relative defence theme sensitivity

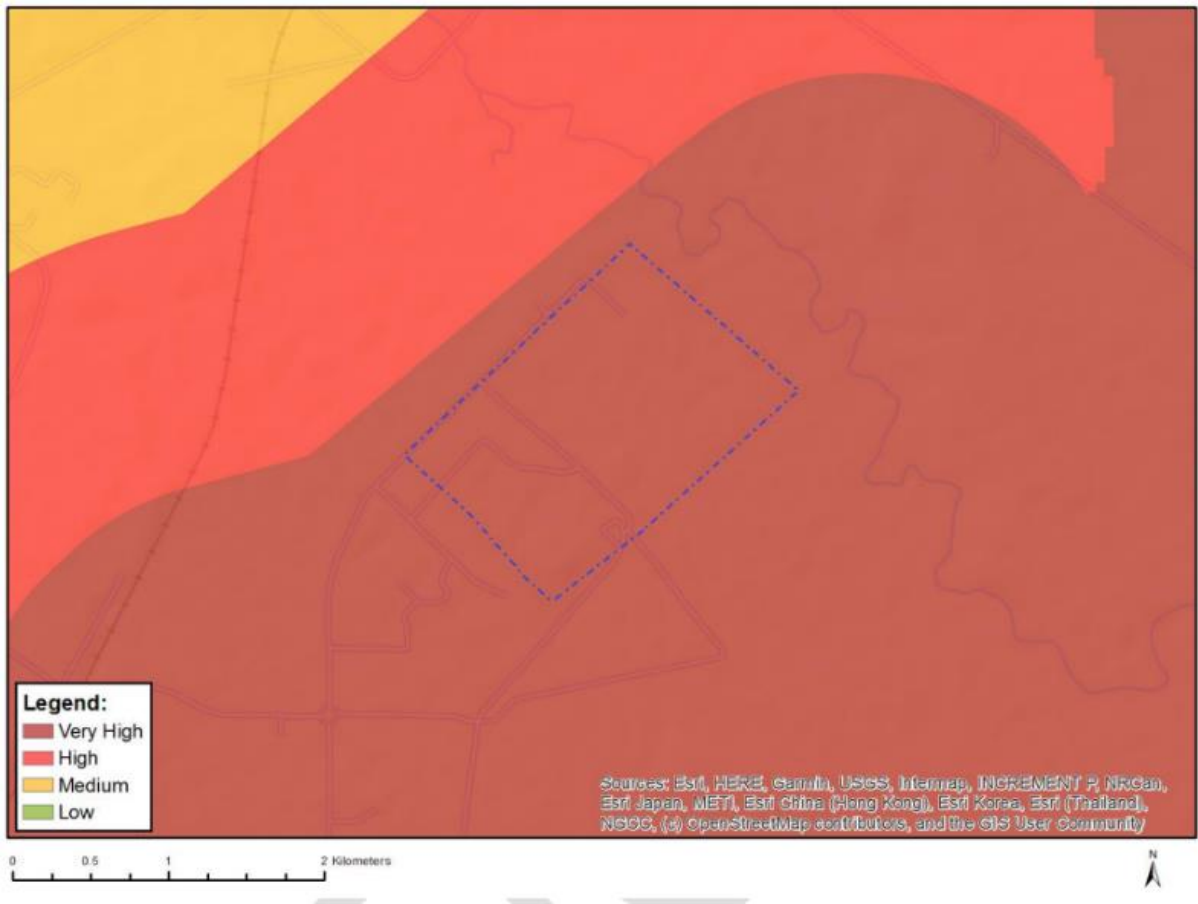


Figure 10: Map of relative landscape (solar) theme sensitivity

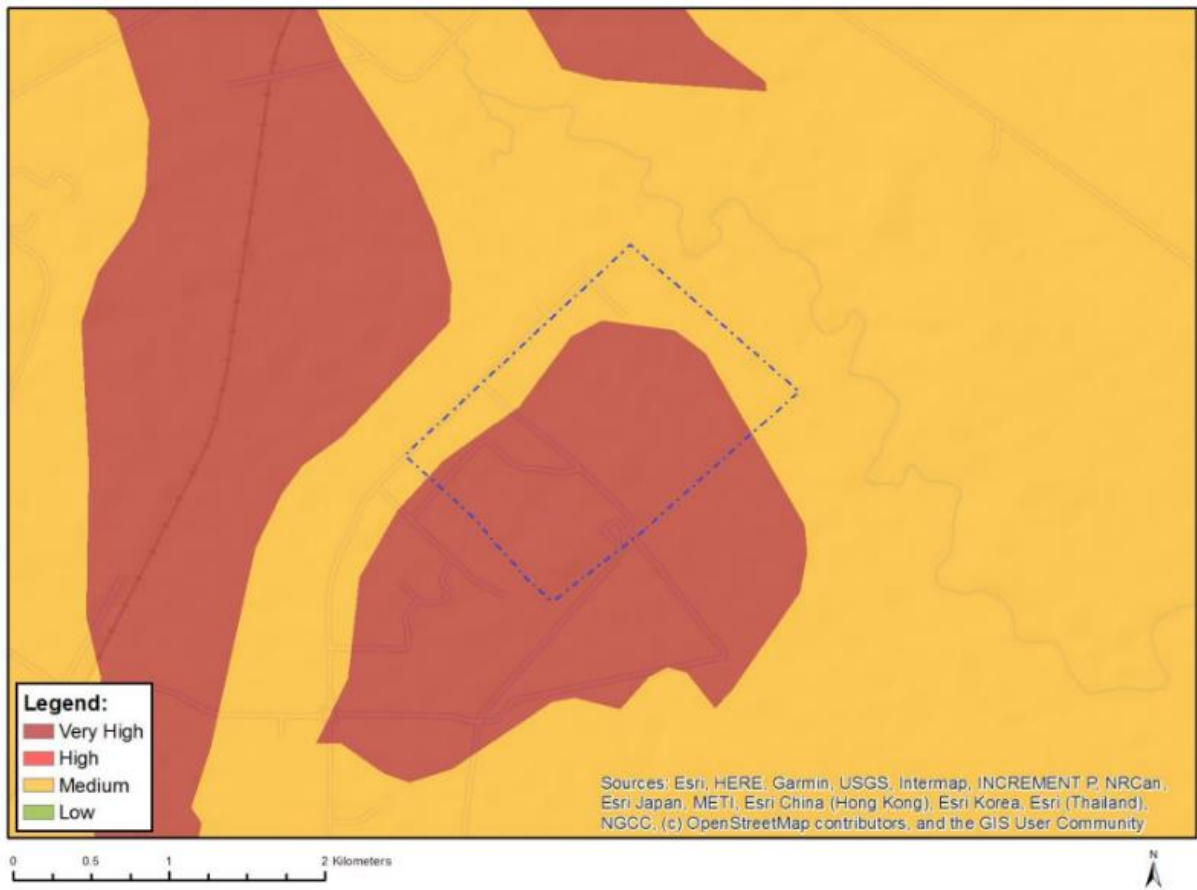


Figure 11: Map of relative palaeontology theme sensitivity



Figure 12: Map of relative plant species theme sensitivity



Figure 13: Map of relative RFI theme sensitivity



Figure 14: Map of relative terrestrial biodiversity theme sensitivity

7.3 Sub-section 3: Declaration

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

Signature Proponent/applicant/ holder of EA

Date:

Signed by:Thomas John Wilson
Signed at:2022-11-11 09:27:31 +02:00
Reason:Witnessing Thomas John Wilson



This declaration will be signed by the proponent/applicant/holder of the EA once the contractor is appointed and has provided inputs to this Generic EMPr as per the requirements of this template.

7.4 Sub-section 4: amendments to site specific information (Part B; section 2)

Should the EA be transferred to a new holder, Part B: Section 2 must be completed by the new holder and submitted with the application for an amendment of the EA in terms of Regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted for an amendment to an environmental authorisation will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

» PART C

8 SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES

If any specific environmental sensitivities/attributes are present on the site which require more specific impact management outcomes and impact management actions, not included in the pre-approved EMPr template, to manage impacts, those impact management outcomes and actions must be included in this section. These specific management controls must be referenced spatially and must include impact management outcomes and impact management actions. The management controls including impact management outcomes and impact management actions must be presented in the format of the pre-approved EMPr template. This applies only to additional impact management outcomes and impact management actions that are necessary.

If Part C is applicable to the development as authorised in the EA, it is required to be submitted to the CA together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and the name and expertise of the EAP, including the curriculum vitae are to be included. Once approved, Part C forms part of the EMPr for the site and is legally binding.

This section will **not be required** should the site contain no specific environmental sensitivities or attributes.

» CONSTRUCTION AND DECOMMISSIONING OUTCOMES AND ACTIONS

7.1 Ecology (Fauna and Flora)

Impact management outcome: Direct loss of vegetation, including listed and protected species is reduced.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|--|--------------------|--|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Timeframe | Evidence of compliance |
| – Pre-construction walk-through of the power line route/corridor to locate species of conservation concern that can be translocated or avoided. | dEO, Specialist | Visual inspection of the layout with walk-through report produced | Prior to construction | ECO | Once prior to commencement of construction | Walk-through report produced and kept on file during construction |
| – Vegetation clearing to commence only after walkthrough has been conducted and necessary permits obtained | Contractor | Clearing vegetation in line with the obtained permits | Prior to commencement of construction | ECO | Once prior to commencement of construction | Record of permits |
| – Demarcate all areas to be cleared with construction tape or similar material where practical. However, caution should be exercised to avoid using material that might entangle fauna. | Contractor | Erect appropriate temporary barriers around construction areas and ensure material used is fauna-friendly and must be removed following completion of construction. | At the commencement and for the duration of the construction phase | ECO | Monthly | Access to construction area is closed-off through temporary barriers and barriers are maintained to a sufficient standard |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|-----------------------------|---|--------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Timeframe | Evidence of compliance |
| | | | | | | Material used to demarcate construction area is fauna-friendly and removed following completion of construction. |
| – Ensure that laydown areas, construction camps and other temporary use areas are located in areas of low and medium sensitivity and are properly fenced or demarcated as appropriate and practically possible. | cEO, Specialist, Contractor | Laydown areas to be defined during planning of construction activities | Duration of construction phase | ECO | Weekly | Laydown areas located within previously transformed areas or areas of low sensitivity |
| – Pre-construction environmental induction for all construction staff on site to ensure that basic environmental principles are adhered to. This includes topics such as no littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimizing wildlife interactions, remaining within demarcated construction areas etc. | cEO | Requirement for induction of all staff prior to commencement activities, as well as the development and application of an induction programme | Duration of construction phase | ECO | Monthly | Induction roster of all staff completed, maintained and available on site, induction programme material observed and on file on site. |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--|---|--|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Timeframe | Evidence of compliance |
| <p>– Demarcate all areas to be cleared with construction tape or other appropriate and effective means. However, caution should be exercised to avoid using material that might entangle fauna.</p> | dEO / cEO in consultation with the ECO | Erect appropriate temporary barriers around construction areas and ensure material used is fauna-friendly and must be removed following completion of construction. | At the commencement and for the duration of the construction phase | ECO | Monthly | <p>Access to construction area is closed-off through temporary barriers and barriers are maintained to a sufficient standard</p> <p>Material used to demarcate construction area is fauna-friendly and removed following completion of construction.</p> |
| <p>– Pre-construction walk-through of the footprint to locate any active burrows within the site. If there are any active burrows present, the resident fauna should be captured and translocated prior to construction.</p> | cEO, Specialist | Develop a search and relocation plan for fauna species and obtain the relevant permits for the removal of protected species | Prior to construction | ECO | Monthly | <p>No fauna unnecessarily harmed by construction activities</p> <p>Necessary permits obtained prior to the removal of threatened</p> |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|-----------------------------|---|------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Timeframe | Evidence of compliance |
| | | | | | | fauna species, and copies of permits observed during audit |
| – During construction, any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person. | cEO, Specialist, Contractor | Implement search and relocation plan for threatened or dangerous fauna species and obtain the relevant permits for the removal of these species | Operation | Auditor | Annually | No fauna harmed as a result of maintenance activities. Necessary permits obtained prior to the removal of threatened fauna species, and copies of permits observed during audit. |
| – The illegal collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off of the construction site. | Contractor cEO | Awareness created regarding prohibition on the collection, hunting or harvesting of any plants or animals | Duration of construction | ECO | Weekly | No evidence of collection, hunting or harvesting of any plants or animals |
| – No fires should be allowed within the site as there is a risk of runaway veld fires. | cEO | Awareness created regarding the prohibition of fires on site | Duration of construction | ECO | Weekly | No fires on site |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|-------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Timeframe | Evidence of compliance |
| – No fuelwood collection should be allowed on-site. | cEO, Developer | Place signs on site indicating the fuelwood collection is prohibited and include this point in the environmental induction training | During the construction phase | ECO | Weekly | Sign prohibiting collection of fuelwood observed on site and evidence of discussion of this point contained in environmental induction training material |
| – All construction vehicles should adhere to a low-speed limit (40km/h for cars and 30km/h for trucks) to avoid collisions with susceptible species such as snakes and tortoises and rabbits or hares. Speed limits should apply within the facility as well as on the public gravel access roads to the site. | Contractor, cEO | Install speed signage throughout site, include speed limit into induction and ensure all staff entering site are aware of the requirement to implement speed limits. Institute verbal and written warnings for violations and appropriate fines for repeat contraventions. Written log of fines and warning issued kept on site | During the construction phase | ECO | Monthly | Minimal instances of speeding as observed on site during audits and as evidenced in the written log of warnings and fines issued for contraventions |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|--------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Timeframe | Evidence of compliance |
| – All personnel should undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and snakes which are often persecuted out of fear or superstition. | cEO | Requirement for induction of all staff prior to entry, as well as the development and application of an induction programme | Duration of construction phase | ECO | Monthly | Induction roster of all staff completed, maintained and available on site, induction programme material observed and on file on site during audits |

7.2 Avifauna

Impact management outcome: Displacement of priority species due to habitat loss during the construction of the powerlines is reduced. Electrocutation of birds and collision of birds with power lines is reduced.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------------------|--|-------------------------------|--------------------|-----------------------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Attach appropriate marking devices or bird flight diverters (BFDs) on all new power lines to increase visibility. | Developer cEO Contractor | Communicate this requirement to the appropriate Contractor's supervisor prior to the commencement of construction activities | During the construction phase | ECO | Throughout the construction face. | Bird flight diverters observed on power lines. |

7.3 Land Use, Soils and Agricultural Potential

Impact management outcome: Maximise conservation of soils resources.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|---|-------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Ensure that proper stormwater management designs are set in place. | Design Engineer | Prepare an effective stormwater management plan and designs prior to the commencement of construction. | Pre-construction | ECO | Monthly | Evidence of appropriate stormwater management features as part of project design. |
| – Only the proposed and authorised access roads are to be used, this is to reduce any unnecessary compaction of adjacent areas. | Contractor cEO | Ensure that only authorised access roads are used during the construction phase. Visual inspection of the site to determine whether only authorised access roads are being utilised on site. | During the construction phase | ECO | Monthly | Visual observation of authorised access roads being utilised on site. |
| – Prevent any spills from occurring. Machines must be parked within hard park areas and must be checked daily for fluid leaks. | Contractor cEO | Vehicle and equipment storage areas must have hard surfaces and | During the construction phase | ECO | Monthly | Vehicle and equipment storage areas have hard surfaces and are |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|---|--------------------|-----------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | must be appropriately bundled. | | | | appropriately bundled. No spills recorded in the site incident register. |
| – Proper invasive plant control must be undertaken quarterly. | Contractor cEO | Ensure that invasive plant control is undertaken on an ongoing basis (at least quarterly). | During the construction phase | ECO | As and where required | Photographic proof of invasive plant control being undertaken on site. |
| – All excess soil (soil that are stripped and stockpiled to make way for foundations) must be stored, continuously managed / maintained to be used for rehabilitation of eroded areas. | Contractor cEO | Development a procedure for the removal, handling, and storage of soil and ensure implementation of this procedure during the construction phase. | During the construction phase | ECO | Monthly | Copy of procedure for the removal, handling, and storage of soil provided during the review. Visual observation of appropriate soil storage and handling practices on site. |
| – Rip all compacted areas outside of the developed areas that have been compacted. | Contractor cEO | Ensure that ripping is undertaken on all compacted areas outside of the development areas. | Following completion of the construction phase. | ECO | Monthly | Visual observation of ripping being undertaken on compacted areas outside the development areas. |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|-------------------------|--|-------------------------------|--------------------|----------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Ripping must be done by means of a commercial ripper that has at least two rows of tines. | Contractor Developer | Utilise a commercial ripper with at least two rows of tines for ripping purposes. | During the construction phase | ECO | As and when required | Ripping undertaken using a commercial ripper with at least two rows of tines. |
| – Ripping must take place between 1 and 3 days after seeding and following a rainfall event (seeding must therefore be carried out directly after a rainfall event). | Contractor cEO | Ensure that ripping is undertaken between 1 and 3 days after seeding and following a rainfall event. | During the construction phase | ECO | As and when required | Visual observation of ripping being undertaken between 1 and 3 days after seeding and following a rainfall event. |
| – All areas surrounding the development footprint areas that have been degraded by traffic, laydown yards etc. must be ripped and revegetated by means of indigenous grass species. | Contractor cEO | Ensure that areas surrounding the development footprint areas are ripped and revegetated by means of indigenous grass species. | During the construction phase | ECO | As and when required | Visual observation of ripping and revegetation of areas surrounding the development footprint areas with indigenous grass species. |

7.4 Heritage

Impact management outcome: Impacts on heritage and potential burial sites

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|------------------------------------|--|------------------------------|--------------------|--------------------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - 30m Buffer area recommended around site JL2 | Developer/ design consultant | Ensure that 30m 'no-go' buffer are implemented around the site | Prior to construction | ECO | Once-off prior to construction | Project infrastructure avoids the area within the 30m buffer zone for the site, as per the final layout. |
| - 50m Buffer area recommended around site JL5 | Developer/ design consultant | Ensure that 50m 'no-go' buffer are implemented around the site | Prior to construction | ECO | Once-off prior to construction | Project infrastructure avoids the area within the 50m buffer zone for the site, as per the final layout. |

Impact management outcome: Impacts on palaeontological resources reduced.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|-----------------------|---|-------------------------------|--------------------|----------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - If a chance find is made, the person responsible for the find must immediately stop working and all work must cease in the immediate vicinity of the find. | Contractor | Ensure that chance finds are handled in accordance with the chance find procedure for the site. | During the construction phase | ECO | As and when relevant | Chance finds handled in accordance with the chance find procedure. |
| - The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the Environmental Officer (EO) (if appointed) or site manager. The EO must report the find to the relevant | Contractor cEO | Ensure that chance finds are handled in accordance with the chance find | During the construction phase | ECO | As and when relevant | Chance finds handled in accordance with the chance find procedure. |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--------------------------|------------------------------|--------------------|-----------|------------------------|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates. | | procedure for the site. | | | | |

7.5 Visual

Impact management outcome: Visual impact of construction activities on sensitive visual receptors, and the potential impact on the sense of place is reduced.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--|---|---|--------------------|---------------------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Retain and maintain natural vegetation immediately adjacent to the development footprint. | Project proponent/ design consultant Contractor cEO | Visual inspection of the layout to ensure that vegetation immediately adjacent to the development footprint will not be disturbed Ensure that natural vegetation immediately adjacent to the | Prior to construction and during construction | ECO | Ongoing throughout construction | Onsite evidence that natural vegetation immediately adjacent to the development footprint/servitude is retained and maintained. |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--|--|---|--------------------|---|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | development footprint/servitude is retained and maintained. | | | | |
| – Consult adjacent landowners (if present) in order to inform them of the development and to identify any (valid) visual impact concerns. | Developer | Consultation between the developer and adjacent landowners. | During construction | ECO | As and when required | Proof of consultation with adjacent landowners |
| – Ensure that vegetation is not unnecessarily removed during the construction phase. | Contractor cEO | Visual inspection of the project site to ensure that no unnecessary vegetation clearance is being undertaken. Include this mitigation in the contractor's environmental awareness training. | During construction | ECO | Daily, during the vegetation clearance phase and monthly thereafter | Onsite evidence that not unnecessary vegetation clearance is being undertaken. |
| – Plan the placement of laydown areas and temporary construction equipment camps in order to minimise vegetation clearing (i.e., in already disturbed areas) wherever possible. | Project proponent/ design consultant Contractor cEO | Ensure that temporary construction infrastructure in the final layout is placed within already disturbed areas, where possible. | Prior to construction and during construction | ECO | Once-off review of the final layout prior to construction and as and when required during the | Photographic proof that temporary construction infrastructure is placed in already disturbed areas, where possible. |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|--------------------|--|------------------------------------|--------------------|--------------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | Ensure that temporary construction infrastructure is established within already disturbed areas, where possible, during the construction phase. | | | construction phase | Final layout shows placement of temporary construction infrastructure within already disturbed areas. |
| – Restrict the activities and movement of construction workers and vehicles to the immediate construction site and existing access roads. | Contractor | Demarcate construction site to restrict movement within the construction site and immediate area. Inform the contractors, through inclusion of this condition in the environmental awareness training and contractor's packs, that movement should be restricted to existing access roads. | Duration of the construction phase | ECO | Monthly | Reduced duration of the construction phase. Copy of construction programme provided during audit |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------------------|--|------------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Ensure that rubble, litter, and disused construction materials are appropriately stored (if not removed daily) and then disposed regularly at licensed waste facilities. | Contractor | Waste to be appropriately stored in designated areas. Disposal of waste at licensed waste disposal facilities must be undertaken as per the waste management plan | Duration of the construction phase | ECO | Monthly | Appropriate storage of waste in designated areas. Disposal certificates of disposal at licensed facilities to be provided |
| – Reduce and control construction dust using approved dust suppression techniques as and when required (i.e. whenever dust becomes apparent). | Contractor | Apply appropriate dust suppression techniques. | Duration of the construction phase | ECO | Weekly | Contractor to provide proof of use of appropriate dust suppression technique. Photographic evidence that dust suppression is being undertaken on site |
| – Restrict construction activities to daylight hours whenever possible in order to reduce lighting impacts. | Developer Contractor cEO | Ensure that working hours are clearly communicated to construction workers and that the working hours are restricted to | Duration of the construction phase | ECO | Daily | Limited construction activities taking place at night. |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|--------------------------------------|--------------------|--|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | daylight hours and are adhered to. | | | | |
| – Remove infrastructure not required for the post-decommissioning use. | Contractor | Removal of all infrastructure not required for the post-decommissioning use. | At the end of the Construction Phase | ECO dEO | Once, following the completion of the construction phase | No infrastructure that is not required for the post-decommissioning use is present following the completion of the construction phase. |
| – Rehabilitate all disturbed areas immediately after the completion of construction works. | Contractor cEO | Ensure that disturbed areas are rehabilitated immediately after completion of construction works and that this is communicated to the contractor. Develop and implement a rehabilitation plan for the site. | Following completion of construction | ECO | As and when required | Visual observation that disturbed areas are rehabilitated immediately after the completion of construction works. |

» OPERATIONAL PHASE OUTCOMES AND ACTIONS

7.6 Ecology (Fauna and Flora)

Impact management outcome: Direct loss of vegetation, including listed and protected species is reduced.

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|-----------------------------|---|------------------------------|--------------------|----------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| - Any potentially dangerous fauna such as snakes or fauna threatened by the maintenance and operational activities should be removed to a safe location. | cEO, Specialist, Contractor | Develop a search and relocation plan for threatened or dangerous fauna species and obtain the relevant permits for the removal of these species | Operation and maintenance | dEO | As and when required | Necessary permits obtained prior to the removal of threatened fauna species, and copies of permits observed during audit. |
| - All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. | Contractor | Suitable bunding and containment, demarcation and access control measures implemented for hazardous materials at onsite stores. Spill prevention and response plan developed, and | Duration of the project | dEO | Monthly | Effective bunding and containment of hazardous materials as evidenced on site, along with suitable access control and demarcation provided at hazardous materials stores. Written log of |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|---|-------------------------------|--------------------|-----------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | spill kits made available, as well as all staff inducted with spill response procedure and a log of inductions kept on file. Written record of spills and clean up actions kept on site | | | | spills and clean up actions implemented observed and kept on file at site |
| - All vehicles accessing the site should adhere to a low-speed limit (30km/h max) to avoid collisions with susceptible species such as snakes and tortoises. | Contractor, cEO | Install speed signature throughout site, include speed limit into induction and ensure all staff entering site is aware of the requirement to implement speed limits. Institute verbal and written warnings for violations and appropriate fines for repeat contraventions. | During the construction phase | dEO | Monthly | Minimal instances of speeding as observed on site during audits and as evidenced in the written log of warnings and fines issued for contraventions |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|------------------------|--|--|-----------------------|---|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | Written log of fines and warning issued kept on site | | | | |
| - Alien plant control and erosion management at the site should take place according to the respective management plans. | Operator Specialist | Invasive Alien Plant species eradication and management programme developed for the construction phase of the project, detailing monitoring required, control methods and frequency. | Operation | External Auditor, dEO | Annually – external audit and quarterly dEO | Invasive alien plant species appropriately managed |
| - All roads and other hardened surfaces should have runoff control features which redirect water flow and dissipate any energy in the water which may pose an erosion risk. | Contractor, cEO | Develop and implement a stormwater management plan | Prior to construction commencing, and for the duration of construction and operation phase | dEO/cEO | Monthly | Evidence of implementation of the stormwater management plan is observed |
| - Regular monitoring for alien plant invasion and erosion after construction to ensure that no invasion or erosion problems have developed as result of the disturbance must be undertaken, as per the respective Management Plans for the project. | Operator Specialist | Invasive Alien Plant species eradication and management programme | Operation | External Auditor, dEO | Annually – external audit and quarterly dEO | Invasive alien plant species appropriately managed |

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|-------------------------------------|--------------------|---------------|---|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | developed for the construction phase of the project, detailing monitoring required, control methods and frequency. | | | | |
| - All disturbed areas that are not used such as excess road widths, should be rehabilitated with locally occurring shrubs and grasses after construction to reduce the overall footprint of the development. | Contractor, cEO | Visual inspection of infrastructure to determine if all areas have been re-vegetated | Operation phase | cEO, dEO | Monthly | No evidence of disturbed areas affected by development and negligible erosion observed |
| - No planting or importing any listed invasive alien plant species (all Category 1a, 1b and 2 invasive species) to the site for landscaping, rehabilitation or any other purpose must be undertaken. | Contractor cEO | Identify listed alien invasive plants which may not be used for rehabilitation | Prior to operation (rehabilitation) | cEO, dEO | When required | No evidence of identified alien invasive species for site landscaping or rehabilitation |

7.7 Avifauna

Impact management outcome: Displacement of priority species due to habitat loss during the operation activities of the power lines is reduced.

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|------------------------------|--------------------|-------------------------------|---------------------------------------|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – Implement post-construction monitoring and carcass surveys | Developer EO | Undertake monitoring and carcass surveys | Post-construction | dEO | Daily | Record monitoring and carcass surveys |
| – Compile management programme to assess efficacy of mitigation and on-going research/trials | Developer EO | Develop avifauna monitoring efficacy programme | Operation | dEO | Monthly for at least one year | Copy of efficacy management programme |
| – Report mortalities (number, locality and species) to Electrical Energy Mortality Register at EWT | Developer EO | Report mortalities on register | Operation | dEO | Operation (on-going) | Record of reported mortalities |

Impact management outcome: Minimisation of the likelihood of electrocution of birds and collision with power lines during the operational.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|---|--|--|--------------------|------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| <p>– Develop and implement a carcass search programme for birds during the first two years of operation, in line with the South African monitoring guidelines (Jenkins <i>et al.</i> 2015). This program must include monitoring of power lines.</p> | <p>Specialist</p> <p>Operator</p> | <p>Develop a carcass search programme for implementation during operation.</p> | <p>During the operation phase</p> | <p>dEO</p> | <p>Quarterly</p> | <p>Evidence of implementation of the carcass search programme.</p> <p>Minimal to no carcasses observed on site during audit.</p> |
| <p>– A site specific Operational Environmental Management Plan (OEMP) must be implemented, which gives appropriate and detailed description of how operational and maintenance activities must be conducted to reduce potential problems. All staff are to adhere to the OEMP and should apply good environmental practice during all operations.</p> | <p>Environmental Consultant</p> <p>EO</p> | <p>Develop and implement a site-specific Operational EMP.</p> | <p>Prior to construction and operation</p> | <p>dEO</p> | <p>Annually</p> | <p>Copy of Operational EMP and evidence of implementation of mitigation actions proposed in the EMP observed on site.</p> |

Impact management outcome: Cumulative impacts of the powerlines on avifauna is reduced.

| Impact Management Actions | Implementation | | | Monitoring | | |
|--|--------------------|--|------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – The applicant and operational neighbouring projects should proactively collaborate in research and mitigation if incidents on Priority species occur. Data must be shared, and research efforts co-ordinated to reduce mortalities in the region of the species above, and where applicable and agreed, effort must be made to assist in funding of such research. | Developer | Consult with representatives from operational neighbouring projects to determine ways to mitigate impacts on priority species. | During the operational phase | dEO | Annually | Proof of consultation with representatives from operational neighbouring projects. |

7.8 Heritage

Impact management outcome: Impacts on graves and burial grounds reduced.

| Impact Management Actions | Implementation | | | Monitoring | | |
|---|------------------------------------|--|------------------------------|--------------------|--------------------------------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| – 30m Buffer area recommended around site JL2 | Developer/ design consultant | Ensure that 30m 'no-go' buffer are implemented around the site | Prior to construction | ECO | Once-off prior to construction | Project infrastructure avoids the area within the 30m buffer zone for the site, as per the final layout. |
| – 50m Buffer area recommended around site JL5 | Developer/ design consultant | Ensure that 50m 'no-go' buffer are | Prior to construction | ECO | Once-off prior to construction | Project infrastructure avoids the area within the |

| Impact Management Actions | Implementation | | | Monitoring | | |
|---------------------------|--------------------|-----------------------------|------------------------------|--------------------|-----------|--|
| | Responsible person | Method of implementation | Timeframe for implementation | Responsible person | Frequency | Evidence of compliance |
| | | implemented around the site | | | | 50m buffer zone for the site, as per the final layout. |

» **APPENDIX 1: METHOD STATEMENTS**

To be prepared by the contractor prior to commencement of the activity. The method statements are **not required** to be submitted to the CA.

Appendix 3 – Project Team CV's

CURRICULUM VITAE OF CHANTELE GEYER

Comprehensive CV

| | |
|-------------------------|---|
| Profession : | Junior Environmental Consultant |
| Specialisation: | Environmental Management; Project-related GIS mapping; Public Participation Administration; General Geology and Geochemistry. |
| Work Experience: | Six (6) months in the environmental field. |

VOCATIONAL EXPERIENCE

Chantelle is a conscientious and ambitious junior Environmental Consultant who holds a BSc(Hons) degree in Environmental Geology. She recently graduated from the North-West University where she consistently stayed in the top 3 of her class. She joined a group of passionate academic peers in her third year to create the first North-West University Geoscience Society to teach young earth scientists about the environment and introduce them to professional mentors, thus bridging the gap between university and a professional career. She was appointed as project manager for this society for two consecutive terms and organized career talks, academic game shows, alumni talks, clean-up initiatives, and numerous team-building events.

She has special interests in geological formations, geochemistry, minerals, contamination studies, rehabilitation and restoration of disturbed areas, as well as hydrology. However, she found her passion for Environmental Management during an environmental internship where she gained experience in:

- Environmental Impact Assessments
- Project-related GIS mapping
- Water use licences
- Public participation processes

Chantelle is a loyal and enthusiastic individual who is dedicated to further her studies in Environmental Management, Environmental Legislation, GIS-mapping, and studies on the renewable energy sector of South Africa. Her goal is to gain knowledge in the processes of Basic Assessments, EIAs, Environmental Compliance, public participation, screening assessments, and environmental authorisation applications. She aims to use this knowledge to strategically consult clients and undertaking projects efficiently and to the highest standard.

SKILLS BASE AND CORE COMPETENCIES

- Great organisational skills
- Good at time management
- Passionate about the environment
- Compilation of Basic Assessment Reports in compliance with environmental legislation.
- Project management for environmental-related events and projects.
- Water Use Licences
- Aiding with public participation processes.
- Experience with South African environmental legislation.

EDUCATION AND PROFESSIONAL STATUS

Degrees:

- BSc Environmental Sciences, North-West University, Potchefstroom (2021)
- BSc Honours Environmental Geology, North-West University, Potchefstroom (2022)

Short Courses:

- Advanced Microsoft Excel Qualification, Lead Academy (2020)

Professional Society Affiliations:

- Registered with the International Association for Impact Assessment South Africa (IAIASa)

EMPLOYMENT

| Date | Company | Roles and Responsibilities |
|---|----------------------------------|---|
| July 2022 - Current: | Savannah Environmental (Pty) Ltd | <i>Junior Environmental Consultant</i> <u>Tasks include:</u> <i>Environmental Assessment Practitioner (EAP); Specialising in project-related GIS mapping, Performing Basic Assessment Reports and Environmental Impact Assessments, Assisting on administrative public participation documents.</i> |
| September 2021 – November 2021 | Prescali Environmental (Pty) | <i>Environmental Intern</i> <u>Tasks included:</u> <i>Liaising with senior management on environmental concerns, Preparing Water Use Licence (WUL) audits, Taking minutes during meetings, Public Participation tasks.</i> |

PROJECT EXPERIENCE

Project experience includes renewable energy projects, grid connection infrastructure, and access roads.

RENEWABLE POWER GENERATION PROJECTS: SOLAR ENERGY FACILITIES

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|--|---|-----------------------------|
| Mutsho Solar PV (4x100MW projects, Limpopo) | Cri-Eagle | Junior EAP & GIS Specialist |
| Harmony One Plant Solar PV Facility (30MW), Free State | ENGP | Junior EAP & GIS Specialist |
| Harmony Target Solar PV Facility (30MW), Free State | ENGP | Junior EAP & GIS Specialist |
| Harmony Joel Solar PV Facility (18MW), Free State | ENGP | Junior EAP & GIS Specialist |
| Umbhila Emoyeni SEF (150MW), Mpumalanga | Windlab Developments South Africa (Pty) Ltd | Junior EAP & GIS Specialist |

Basic Assessments

| Project Name & Location | Client Name | Role |
|--|--------------------|-----------------------------|
| Harmony Central Plant Solar PV Facility (14MW), Free State | ENGP | Junior EAP & GIS Specialist |
| Harmony Moab Khotsong Solar PV Facility (100MW), Free State | ENGP | Junior EAP & GIS Specialist |
| Highveld Solar PV Facility (240MW), North West | WKN Windcurrent | Junior EAP & GIS Specialist |
| Komsberg Solar PV Facility (200MW), Western and Northern Cape | Salika SA | Junior EAP & GIS Specialist |
| Klipfontein Solar PV Facility (500MW), Western and Northern Cape | Salika SA | Junior EAP & GIS Specialist |

RENEWABLE POWER GENERATION PROJECTS: WIND ENERGY FACILITIES

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|---|---|-----------------------------|
| Umbhila Emoyeni WEF (666MW), Mpumalanga | Windlab Developments South Africa (Pty) Ltd | Junior EAP & GIS Specialist |

GRID INFRASTRUCTURE PROJECTS

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|------------------------------------|---|-----------------------------|
| Umbhila Emoyeni EGI, Mpumalanga | Windlab Developments South Africa (Pty) Ltd | Junior EAP & GIS Specialist |

Basic Assessments

| Project Name & Location | Client Name | Role |
|--|--------------------|-----------------------------|
| Mutsho Solar Grid Connection, Limpopo | Cri-Eagle | Junior EAP & GIS Specialist |
| Highveld Grid Connection, North West | WKN Windcurrent | Junior EAP & GIS Specialist |
| Komsberg Grid Connection, Western and Northern Cape | Salika SA | Junior EAP & GIS Specialist |
| Klipfontein Grid Connection, Western and Northern Cape | Salika SA | Junior EAP & GIS Specialist |

INFRASTRUCTURE DEVELOPMENT PROJECTS (BRIDGES, PIPELINES, ROADS, WATER RESOURCES, STORAGE, ETC)

Basic Assessments

| Project Name & Location | Client Name | Role |
|--|--|--|
| <i>Witberg WEF Access Road, Western Cape</i> | <i>Red Rocket South Africa (Pty) Ltd</i> | <i>Junior EAP and GIS Specialist</i> |



CURRICULUM VITAE OF JO-ANNE THOMAS

| | |
|-------------------------|---|
| Profession: | Environmental Management and Compliance Consultant; Environmental Assessment Practitioner |
| Specialisation: | Environmental Management; Strategic environmental advice; Environmental compliance advice & monitoring; Environmental Impact Assessments; Policy, strategy & guideline formulation; Project Management; General Ecology |
| Work experience: | Twenty four (24) years in the environmental field |

VOCATIONAL EXPERIENCE

Provide technical input for projects in the environmental management field, specialising in Strategic Environmental Advice, Environmental Impact Assessment studies, environmental auditing and monitoring, environmental permitting, public participation, Environmental Management Plans and Programmes, environmental policy, strategy and guideline formulation, and integrated environmental management. Key focus on integration of the specialist environmental studies and findings into larger engineering-based projects, strategic assessment, and providing practical and achievable environmental management solutions and mitigation measures. Responsibilities for environmental studies include project management (including client and authority liaison and management of specialist teams); review and manipulation of data; identification and assessment of potential negative environmental impacts and benefits; review of specialist studies; and the identification of mitigation measures. Compilation of the reports for environmental studies is in accordance with all relevant environmental legislation.

Undertaking of numerous environmental management studies has resulted in a good working knowledge of environmental legislation and policy requirements. Recent projects have been undertaken for both the public- and private-sector, including compliance advice and monitoring, electricity generation and transmission projects, various types of linear developments (such as National Road, local roads and power lines), waste management projects (landfills), mining rights and permits, policy, strategy and guideline development, as well as general environmental planning, development and management.

SKILLS BASE AND CORE COMPETENCIES

- Project management for a range of projects
- Identification and assessment of potential negative environmental impacts and benefits through the review and manipulation of data and specialist studies
- Identification of practical and achievable mitigation and management measures and the development of appropriate management plans
- Compilation of environmental reports in accordance with relevant environmental legislative requirements
- External and peer review of environmental reports & compliance advice and monitoring
- Formulation of environmental policies, strategies and guidelines
- Strategic and regional assessments; pre-feasibility & site selection
- Public participation processes for a variety of projects
- Strategic environmental advice to a wide variety of clients both in the public and private sectors
- Working knowledge of environmental planning processes, policies, regulatory frameworks and legislation

EDUCATION AND PROFESSIONAL STATUS

Degrees:

- B.Sc Earth Sciences, University of the Witwatersrand, Johannesburg (1993)
- B.Sc Honours in Botany, University of the Witwatersrand, Johannesburg (1994)
- M.Sc in Botany, University of the Witwatersrand, Johannesburg (1996)

Short Courses:

- Environmental Impact Assessment, Potchefstroom University (1998)
- Environmental Law, Morgan University (2001)
- Environmental Legislation, IMBEWU (2017)
- Mining Legislation, Cameron Cross & Associates (2013)
- Environmental and Social Risk Management (ESRM), International Finance Corporation (2018)

Professional Society Affiliations:

- Registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA) (2019/726)
- Registered with the South African Council for Natural Scientific Professions as a Professional Natural Scientist: Environmental Scientist (400024/00)
- Registered with the International Association for Impact Assessment South Africa (IAIASa): 5601
- Member of the South African Wind Energy Association (SAWEA)

EMPLOYMENT

| Date | Company | Roles and Responsibilities |
|-------------------------|----------------------------------|--|
| January 2006 - Current: | Savannah Environmental (Pty) Ltd | Director Project manager Independent specialist environmental consultant, Environmental Assessment Practitioner (EAP) and advisor. |
| 1997 – 2005: | Bohlweki Environmental (Pty) Ltd | Senior Environmental Scientist at. Environmental Management and Project Management |
| January – July 1997: | Sutherland High School, Pretoria | Junior Science Teacher |

PROJECT EXPERIENCE

Project experience includes large infrastructure projects, including electricity generation and transmission, wastewater treatment facilities, mining and prospecting activities, property development, and national roads, as well as strategy and guidelines development.

RENEWABLE POWER GENERATION PROJECTS: PHOTOVOLTAIC SOLAR ENERGY FACILITIES

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|---|----------------------------|-----------------------|
| Christiana PV 2 SEF, North West | Solar Reserve South Africa | Project Manager & EAP |
| De Aar PV facility, Northern Cape | iNca Energy | Project Manager & EAP |
| Everest SEF near Hennenman, Free State | FRV Energy South Africa | Project Manager & EAP |
| Graafwater PV SEF, Western Cape | iNca Energy | Project Manager & EAP |
| Grootkop SEF near Allanridge, Free State | FRV Energy South Africa | Project Manager & EAP |
| Hertzogville PV 2 SEF with 2 phases, Free State | SunCorp / Solar Reserve | Project Manager & EAP |

| Project Name & Location | Client Name | Role |
|---|---|-----------------------|
| Karoshhoek CPV facility on site 2 as part of the larger Karoshhoek Solar Valley Development East of Upington, Northern Cape | FG Emvelo | Project Manager & EAP |
| Kgabalatsane SEF North-East for Brits, North West | Built Environment African Energy Services | Project Manager & EAP |
| Kleinbegin PV SEF West of Groblershoop, Northern Cape | MedEnergy Global | Project Manager & EAP |
| Lethabo Power Station PV Installation, Free State | Eskom Holdings SoC Limited | Project Manager & EAP |
| Majuba Power Station PV Installation, Mpumalanga | Eskom Holdings SoC Limited | Project Manager & EAP |
| Merapi PV SEF Phase 1 – 4 South-East of Excelsior, Free State | SolaireDirect Southern Africa | Project Manager & EAP |
| Sannaspos Solar Park, Free State | SolaireDirect Southern Africa | Project Manager & EAP |
| Ofir-Zx PV Plant near Keimoes, Northern Cape | S28 Degrees Energy | Project Manager & EAP |
| Oryx SEF near Virginia, Free State | FRV Energy South Africa | Project Manager & EAP |
| Project Blue SEF North of Kleinsee, Northern Cape | WWK Development | Project Manager & EAP |
| S-Kol PV Plant near Keimoes, Northern Cape | S28 Degrees Energy | Project Manager & EAP |
| Sonnenberg PV Plant near Keimoes, Northern Cape | S28 Degrees Energy | Project Manager & EAP |
| Tutuka Power Station PV Installation, Mpumalanga | Eskom Transmission | Project Manager & EAP |
| Two PV sites within the Northern Cape | MedEnergy Global | Project Manager & EAP |
| Two PV sites within the Western & Northern Cape | iNca Energy | Project Manager & EAP |
| Upington PV SEF, Northern Cape | MedEnergy Global | Project Manager & EAP |
| Vredendal PV facility, Western Cape | iNca Energy | Project Manager & EAP |
| Waterberg PV plant, Limpopo | Thupela Energy | Project Manager & EAP |
| Watershed Phase I & II SEF near Litchtenburg, North West | FRV Energy South Africa | Project Manager & EAP |
| Alldays PV & CPV SEF Phase 1, Limpopo | BioTherm Energy | Project Manager & EAP |
| Hyperion PV Solar Development 1, 2, 3, 4, 5 & 6, Northern Cape | Building Energy | Project Manager & EAP |
| Vrede & Rondavel PV, Free State | Mainstream Renewable Energy Developments | Project Manager & EAP |

Basic Assessments

| Project Name & Location | Client Name | Role |
|---|--------------------------------------|-----------------------|
| Aberdeen PV SEF, Eastern Cape | BioTherm Energy | Project Manager & EAP |
| Christiana PV 1 SEF on Hartebeestpan Farm, North-West | Solar Reserve South Africa | Project Manager & EAP |
| Heuningspruit PV1 & PV 2 facilities near Koppies, Free State | Sun Mechanics | Project Manager & EAP |
| Kakamas PV Facility, Northern Cape | iNca Energy | Project Manager & EAP |
| Kakamas II PV Facility, Northern Cape | iNca Energy | Project Manager & EAP |
| Machadodorp 1 PV SEF, Mpumalanga | Solar To Benefit Africa | Project Manager & EAP |
| PV site within the Northern Cape | iNca Energy | Project Manager & EAP |
| PV sites within 4 ACSA airports within South Africa, National | Airports Company South Africa (ACSA) | Project Manager & EAP |
| RustMo1 PV Plant near Buffelspoort, North West | Momentous Energy | Project Manager & EAP |
| RustMo2 PV Plant near Buffelspoort, North West | Momentous Energy | Project Manager & EAP |
| RustMo3 PV Plant near Buffelspoort, North West | Momentous Energy | Project Manager & EAP |
| RustMo4 PV Plant near Buffelspoort, North West | Momentous Energy | Project Manager & EAP |

| Project Name & Location | Client Name | Role |
|---|--|-----------------------|
| Sannaspos PV SEF Phase 2 near Bloemfontein, Free State | SolaireDirect Southern Africa | Project Manager & EAP |
| Solar Park Expansion within the Rooiwal Power Station, Gauteng | AFRKO Energy | Project Manager & EAP |
| Steynsrus SEF, Free State | SunCorp | Project Manager & EAP |
| Sirius Solar PV Project Three and Sirius Solar PV Project Four (BA in terms of REDZ regulations), Northern Cape | SOLA Future Energy | Project Manager & EAP |
| Northam PV, Limpopo Province | Northam Platinum | Project Manager & EAP |
| Kolkies PV Suite (x 6 projects) and Sadawa PV Suite (x 4 projects), Western Cape | Mainstream Renewable Energy Developments | Project Manager & EAP |

Screening Studies

| Project Name & Location | Client Name | Role |
|--|----------------------------|-----------------------|
| Allemans Fontein SEF near Noupoot, Northern Cape | Fusion Energy | Project Manager & EAP |
| Amandel SEF near Thabazimbi, Limpopo | iNca Energy | Project Manager & EAP |
| Arola/Doomplaat SEF near Ventersdorp, North West | FRV & iNca Energy | Project Manager & EAP |
| Bloemfontein Airport PV Installation, Free State | The Power Company | Project Manager & EAP |
| Brakspuit SEF near Klerksorp, North West | FRV & iNca Energy | Project Manager & EAP |
| Carolus Poort SEF near Noupoot, Northern Cape | Fusion Energy | Project Manager & EAP |
| Damfontein SEF near Noupoot, Northern Cape | Fusion Energy | Project Manager & EAP |
| Everest SEF near Welkom, Free State | FRV & iNca Energy | Project Manager & EAP |
| Gillmer SEF near Noupoot, Northern Cape | Fusion Energy | Project Manager & EAP |
| Grootkop SEF near Allansridge, Free State | FRV & iNca Energy | Project Manager & EAP |
| Heuningspruit PV1 & PV 2 near Koppies, Free State | Cronimat | Project Manager & EAP |
| Kimberley Airport PV Installation, Northern Cape | The Power Company | Project Manager & EAP |
| Kolonnade Mall Rooftop PV Installation in Tshwane, Gauteng | Momentous Energy | Project Manager & EAP |
| Loskop SEF near Groblersdal, Limpopo | S&P Power Unit | Project Manager & EAP |
| Marble SEF near Marble Hall, Limpopo | S&P Power Unit | Project Manager & EAP |
| Morgenson PV1 SEF South-West of Windsorton, Northern Cape | Solar Reserve South Africa | Project Manager & EAP |
| OR Tambo Airport PV Installation, Gauteng | The Power Company | Project Manager & EAP |
| Oryx SEF near Virginia, Free State | FRV & iNca Energy | Project Manager & EAP |
| Rhino SEF near Vaalwater, Limpopo | S&P Power Unit | Project Manager & EAP |
| Rustmo2 PV Plant near Buffelspoort, North West | Momentous Energy | Project Manager & EAP |
| Spitskop SEF near Northam, Limpopo | FRV & iNca Energy | Project Manager & EAP |
| Steynsrus PV, Free State | Suncorp | Project Manager & EAP |
| Tabor SEF near Polokwane, Limpopo | FRV & iNca Energy | Project Manager & EAP |
| Upington Airport PV Installation, Northern Cape | The Power Company | Project Manager & EAP |
| Valeria SEF near Hartebeestpoort Dam, North West | Solar to Benefit Africa | Project Manager & EAP |
| Watershed SEF near Lichtenburg, North West | FRV & iNca Energy | Project Manager & EAP |
| Witkop SEF near Polokwane, Limpopo | FRV & iNca Energy | Project Manager & EAP |
| Woodmead Retail Park Rooftop PV Installation, Gauteng | Momentous Energy | Project Manager & EAP |

Environmental Compliance, Auditing and ECO

| Project Name & Location | Client Name | Role |
|--|------------------|-----------------|
| ECO and bi-monthly auditing for the construction of the Adams Solar PV Project Two South of Hotazel, | Enel Green Power | Project Manager |

| Project Name & Location | Client Name | Role |
|--|------------------------|-----------------|
| Northern Cape | | |
| ECO for the construction of the Kathu PV Facility, Northern Cape | REISA | Project Manager |
| ECO and bi-monthly auditing for the construction of the Pulida PV Facility, Free State | Enel Green Power | Project Manager |
| ECO for the construction of the RustMo1 SEF, North West | Momentous Energy | Project Manager |
| ECO for the construction of the Sishen SEF, Northern Cape | Windfall 59 Properties | Project Manager |
| ECO for the construction of the Upington Airport PV Facility, Northern Cape | Sublary Trading | Project Manager |
| Quarterly compliance monitoring of compliance with all environmental licenses for the operation activities at the Kathu PV facility, Northern Cape | REISA | Project Manager |
| ECO for the construction of the Konkoonsies II PV SEF and associated infrastructure, Northern Cape | BioTherm Energy | Project Manager |
| ECO for the construction of the Aggeneys PV SEF and associated infrastructure, Northern Cape | BioTherm Energy | Project Manager |

Compliance Advice and ESAP Reporting

| Project Name & Location | Client Name | Role |
|---|--|-----------------------|
| Aggeneys Solar Farm, Northern Cape | BioTherm Energy | Environmental Advisor |
| Airies II PV Facility SW of Kenhardt, Northern Cape | BioTherm Energy | Environmental Advisor |
| Kalahari SEF Phase II in Kathu, Northern Cape | Engle | Environmental Advisor |
| Kathu PV Facility, Northern Cape | Building Energy | Environmental Advisor |
| Kenhardt PV Facility, Northern Cape | BioTherm Energy | Environmental Advisor |
| Kleinbegin PV SEF West of Groblershoop, Northern Cape | MedEnergy | Environmental Advisor |
| Konkoonsies II SEF near Pofadder, Northern Cape | BioTherm Energy | Environmental Advisor |
| Konkoonsies Solar Farm, Northern Cape | BioTherm Energy | Environmental Advisor |
| Lephalale SEF, Limpopo | Exxaro | Environmental Advisor |
| Pixley ka Seme PV Park, South-East of De Aar, Northern Cape | African Clean Energy Developments (ACED) | Environmental Advisor |
| RustMo1 PV Plant near Buffelspoort, North West | Momentous Energy | Environmental Advisor |
| Scuitdrift 1 SEF & Scuitdrift 2 SEF, Limpopo | Building Energy | Environmental Advisor |
| Sirius PV Plants, Northern Cape | Aurora Power Solutions | Environmental Advisor |
| Upington Airport PV Power Project, Northern Cape | Sublary Trading | Environmental Advisor |
| Upington SEF, Northern Cape | Abengoa Solar | Environmental Advisor |
| Ofir-ZX PV SEF near Keimoes, Northern Cape | Network S28 Energy | Environmental Advisor |
| Environmental Permitting for the Steynsrus PV1 & PV2 SEF's, Northern Cape | Cronimet Power Solutions | Environmental Advisor |
| Environmental Permitting for the Heuningspruit PV SEF, Northern Cape | Cronimet Power Solutions | Environmental Advisor |

Due Diligence Reporting

| Project Name & Location | Client Name | Role |
|---|------------------------|-----------------------|
| 5 PV SEF projects in Lephalale, Limpopo | iNca Energy | Environmental Advisor |
| Prieska PV Plant, Northern Cape | SunEdison Energy India | Environmental Advisor |
| Sirius Phase One PV Facility near Upington, Northern Cape | Aurora Power Solutions | Environmental Advisor |

Environmental Permitting, S53, Water Use Licence (WUL), Waste Management Licence (WML) & Other Applications

| Project Name & Location | Client Name | Role |
|--|--------------------------|-----------------------|
| Biodiversity Permit & WULA for the Aggeneys SEF near Aggeneys, Northern Cape | BioTherm Energy | Project Manager & EAP |
| Biodiversity Permit for the Konkoonises II SEF near Pofadder, Northern Cape | BioTherm Energy | Project Manager & EAP |
| Biodiversity Permitting for the Lephallale SEF, Limpopo | Exxaro Resources | Project Manager & EAP |
| Environmental Permitting for the Kleinbegin PV SEF West of Groblershoop, Northern Cape | MedEnergy | Project Manager & EAP |
| Environmental Permitting for the Upington SEF, Northern Cape | Abengoa Solar | Project Manager & EAP |
| Environmental Permitting for the Kathu PV Facility, Northern Cape | Building Energy | Project Manager & EAP |
| Environmental Permitting for the Konkoonsies Solar Farm, Northern Cape | BioTherm Energy | Project Manager & EAP |
| Environmental Permitting for the Lephallale SEF, Limpopo | Exxaro Resources | Project Manager & EAP |
| Environmental Permitting for the Scuitdrift 1 SEF & Scuitdrift 2 SEF, Limpopo | Building Energy | Project Manager & EAP |
| Environmental Permitting for the Sirius PV Plant, Northern Cape | Aurora Power Solutions | Project Manager & EAP |
| Environmental Permitting for the Steynsrus PV1 & PV2 SEF's, Northern Cape | Cronimet Power Solutions | Project Manager & EAP |
| Environmental Permitting for the Heuningspruit PV SEF, Northern Cape | Cronimet Power Solutions | Project Manager & EAP |
| Permits for the Kleinbegin and UAP PV Plants, Northern Cape | MedEnergy Global | Project Manager & EAP |
| S53 Application for Arriesfontein Solar Park Phase 1 – 3 near Danielskuil, Northern Cape | Solar Reserve / SunCorp | Project Manager & EAP |
| S53 Application for Hertzogville PV1 & PV 2 SEFs, Free State | Solar Reserve / SunCorp | Project Manager & EAP |
| S53 Application for the Bloemfontein Airport PV Facility, Free State | Sublunary Trading | Project Manager & EAP |
| S53 Application for the Kimberley Airport PV Facility, Northern Cape | Sublunary Trading | Project Manager & EAP |
| S53 Application for the Project Blue SEF, Northern Cape | WWK Developments | Project Manager & EAP |
| S53 Application for the Upington Airport PV Facility, Free State | Sublunary Trading | Project Manager & EAP |
| WULA for the Kalahari SEF Phase II in Kathu, Northern Cape | Engie | Project Manager & EAP |

RENEWABLE POWER GENERATION PROJECTS: CONCENTRATED SOLAR FACILITIES (CSP)

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|--|--------------------|-----------------------|
| Ilanga CSP 2, 3, 4, 5, 7 & 9 Facilities near Upington, Northern Cape | Emvelo Holdings | Project Manager & EAP |
| Ilanga CSP near Upington, Northern Cape | Ilangethu Energy | Project Manager & EAP |

| Project Name & Location | Client Name | Role |
|--|-----------------|-----------------------|
| Ilanga Tower 1 Facility near Upington, Northern Cape | Emvelo Holdings | Project Manager & EAP |
| Karoshhoek CPVPD 1-4 facilities on site 2 as part of the larger Karoshhoek Solar Valley Development East of Upington, Northern Cape | FG Emvelo | Project Manager & EAP |
| Karoshhoek CSP facilities on sites 1.4; 4 & 5 as part of the larger Karoshhoek Solar Valley Development East of Upington, Northern Cape | FG Emvelo | Project Manager & EAP |
| Karoshhoek Linear Fresnel 1 Facility on site 1.1 as part of the larger Karoshhoek Solar Valley Development East of Upington, Northern Cape | FG Emvelo | Project Manager & EAP |

Environmental Compliance, Auditing and ECO

| Project Name & Location | Client Name | Role |
|---|----------------------|-----------------|
| ECO for the construction of the !Khi CSP Facility, Northern Cape | Abengoa Solar | Project Manager |
| ECO for the construction of the Ilanga CSP 1 Facility near Upington, Northern Cape | Karoshhoek Solar One | Project Manager |
| ECO for the construction of the folar Park, Northern Cape | Kathu Solar | Project Manager |
| ECO for the construction of the KaXu! CSP Facility, Northern Cape | Abengoa Solar | Project Manager |
| Internal audit of compliance with the conditions of the IWUL issued to the Karoshhoek Solar One CSP Facility, Northern Cape | Karoshhoek Solar One | Project Manager |

Screening Studies

| Project Name & Location | Client Name | Role |
|--|---------------------|-----------------------|
| Upington CSP (Tower) Plant near Kanoneiland, Northern Cape | iNca Energy and FRV | Project Manager & EAP |

Compliance Advice and ESAP reporting

| Project Name & Location | Client Name | Role |
|--|------------------|-----------------------|
| Ilanga CSP Facility near Upington, Northern Cape | Ilangethu Energy | Environmental Advisor |
| Ilangalethu CSP 2, Northern Cape | FG Emvelo | Environmental Advisor |
| Kathu CSP Facility, Northern Cape | GDF Suez | Environmental Advisor |
| Lephalale SEF, Limpopo | Cennergi | Environmental Advisor |
| Solis I CSP Facility, Northern Cape | Brightsource | Environmental Advisor |

Environmental Permitting, S53, Water Use Licence (WUL), Waste Management Licence (WML) & Other Applications

| Project Name & Location | Client Name | Role |
|---|------------------|-----------------------|
| Environmental Permitting for the Ilanga CSP Facility near Upington, Northern Cape | Ilangethu Energy | Project Manager & EAP |
| Environmental Permitting for the Kathu CSP, Northern Cape | GDF Suez | Project Manager & EAP |
| WULA for the Solis I CSP Facility, Northern Cape | Brightsource | Project Manager & EAP |

RENEWABLE POWER GENERATION PROJECTS: WIND ENERGY FACILITIES

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|--|--|-----------------------|
| Sere WEF, Western Cape | Eskom Holdings SoC Limited | EAP |
| Aberdeen WEF, Eastern Cape | Eskom Holdings SoC Limited | Project Manager & EAP |
| Amakhala Emoyeni WEF, Eastern Cape | Windlab Developments | Project Manager & EAP |
| EXXARO West Coast WEF, Western Cape | EXXARO Resources | Project Manager & EAP |
| Goereesoe Wind Farm near Swellendam, Western Cape | iNca Energy | Project Manager & EAP |
| Hartneest WEF, Western Cape | Juwi Renewable Energies | Project Manager & EAP |
| Hopefield WEF, Western Cape | Umoya Energy | EAP |
| Kleinsee WEF, Northern Cape | Eskom Holdings SoC Limited | Project Manager & EAP |
| Klipheuwel/Dassiesfontein WEF within the Overberg area, Western Cape | BioTherm Energy | Project Manager & EAP |
| Moorreesburg WEF, Western Cape | iNca Energy | Project Manager & EAP |
| Oyster Bay WEF, Eastern Cape | Renewable Energy Resources Southern Africa | Project Manager & EAP |
| Project Blue WEF, Northern Cape | Windy World | Project Manager & EAP |
| Rhebokfontein WEF, Western Cape | Moyeng Energy | Project Manager & EAP |
| Spitskop East WEF near Riebeeck East, Eastern Cape | Renewable Energy Resources Southern Africa | Project Manager & EAP |
| Suurplaat WEF, Western Cape | Moyeng Energy | Project Manager & EAP |
| Swellendam WEF, Western Cape | IE Swellendam | Project Manager & EAP |
| Tsitsikamma WEF, Eastern Cape | Exxarro | Project Manager & EAP |
| West Coast One WEF, Western Cape | Moyeng Energy | Project Manager & EAP |

Basic Assessments

| Project Name & Location | Client Name | Role |
|--|--|-----------------------|
| Amakhala Emoyeni Wind Monitoring Masts, Eastern Cape | Windlab Developments | Project Manager & EAP |
| Beaufort West Wind Monitoring Masts, Western Cape | Umoya Energy | Project Manager & EAP |
| Hopefield Community Wind Farm near Hopefield, Western Cape | Umoya Energy | Project Manager & EAP |
| Koekenaap Wind Monitoring Masts, Western Cape | EXXARO Resources | Project Manager & EAP |
| Koingnaas WEF, Northern Cape | Just Palm Tree Power | Project Manager & EAP |
| Laingsburg Area Wind Monitoring Masts, Western Cape | Umoya Energy | Project Manager & EAP |
| Overberg Area Wind Monitoring Masts, Western Cape | BioTherm Energy | Project Manager & EAP |
| Oyster Bay Wind Monitoring Masts, Eastern Cape | Renewable Energy Systems Southern Africa (RES) | Project Manager & EAP |
| Wind Garden & Fronteer WEFs, Eastern Cape | Wind Relc | Project Manager & EAP |

Screening Studies

| Project Name & Location | Client Name | Role |
|--|---------------------|-----------------------|
| Albertinia WEF, Western Cape | BioTherm Energy | Project Manager & EAP |
| Koingnaas WEF, Northern Cape | Just Pal Tree Power | Project Manager & EAP |
| Napier Region WEF Developments, Western Cape | BioTherm Energy | Project Manager & EAP |
| Tsitsikamma WEF, Eastern Cape | Exxarro Resources | Project Manager & EAP |

| Project Name & Location | Client Name | Role |
|---|---|-----------------------|
| Various WEFs within an identified area in the Overberg area, Western Cape | BioTherm Energy | Project Manager & EAP |
| Various WEFs within an identified area on the West Coast, Western Cape | Investec Bank Limited | Project Manager & EAP |
| Various WEFs within an identified area on the West Coast, Western Cape | Eskom Holdings Limited | Project Manager & EAP |
| Various WEFs within the Western Cape | Western Cape Department of Environmental Affairs and Development Planning | Project Manager & EAP |
| Velddrift WEF, Western Cape | VentuSA Energy | Project Manager & EAP |
| Wind 1000 Project | Thabo Consulting on behalf of Eskom Holdings | Project Manager & EAP |
| Wittekleibosch, Snylip & Doriskraal WEFs, Eastern Cape | Exxarro Resources | Project Manager & EAP |

Environmental Compliance, Auditing and ECO

| Project Name & Location | Client Name | Role |
|---|-------------------|-----------------|
| ECO for the construction of the West Coast One WEF, Western Cape | Aurora Wind Power | Project Manager |
| ECO for the construction of the Gouda WEF, Western Cape | Blue Falcon | Project Manager |
| EO for the Dassiesklip Wind Energy Facility, Western Cape | Group 5 | Project Manager |
| Quarterly compliance monitoring of compliance with all environmental licenses for the operation activities at the Gouda Wind Energy facility near Gouda, Western Cape | Blue Falcon | Project Manager |
| Annual auditing of compliance with all environmental licenses for the operation activities at the West Coast One Wind Energy facility near Vredenburg, Western Cape | Aurora Wind Power | Project Manager |
| External environmental and social audit for the Amakhala Wind Farm, Eastern Cape | Cennergi | Project Manager |
| External environmental and social audit for the Tsitsikamma Wind Farm, Eastern Cape | Cennergi | Project Manager |
| ECO for the construction of the Excelsior Wind Farm and associated infrastructure, Northern Cape | BioTherm Energy | Project Manager |
| External compliance audit of the Dassiesklip Wind Energy Facility, Western Cape | BioTherm Energy | Project Manager |

Compliance Advice

| Project Name & Location | Client Name | Role |
|---|--|-----------------------|
| Amakhala Phase 1 WEF, Eastern Cape | Cennergi | Environmental Advisor |
| Dassiesfontein WEF within the Overberg area, Western Cape | BioTherm Energy | Environmental Advisor |
| Excelsior Wind Farm, Western Cape | BioTherm Energy | Environmental Advisor |
| Great Karoo Wind Farm, Northern Cape | African Clean Energy Developments (ACED) | Environmental Advisor |
| Hopefield Community WEF, Western Cape | African Clean Energy Developments (ACED) | Environmental Advisor |

| | | |
|----------------------------------|---------------|-----------------------|
| Rheboksfontein WEF, Western Cape | Moyeng Energy | Environmental Advisor |
| Tiqua WEF, Western Cape | Cennergi | Environmental Advisor |
| Tsitsikamma WEF, Eastern Cape | Cennergi | Environmental Advisor |
| West Coast One WEF, Western Cape | Moyeng Energy | Environmental Advisor |

Due Diligence Reporting

| Project Name & Location | Client Name | Role |
|---|----------------------------------|-----------------------|
| Witteberg WEF, Western Cape | EDPR Renewables | Environmental Advisor |
| IPD Vredenburg WEF within the Saldanha Bay area, Western Cape | IL&FS Energy Development Company | Environmental Advisor |

Environmental Permitting, S53, Water Use Licence (WUL), Waste Management Licence (WML) & Other Applications

| Project Name & Location | Client Name | Role |
|--|--|-----------------------|
| Biodiversity Permitting for the Power Line between the Tsitsikamma Community WEF & the Diep River Substation, Eastern Cape | Cennergi | Project Manager & EAP |
| Biodiversity Permitting for the West Coast One WEF, Western Cape | Aurora Wind Power | Project Manager & EAP |
| Environmental Permitting for the Excelsior WEF, Western Cape | BioTherm Energy | Project Manager & EAP |
| Plant Permits & WULA for the Tsitsikamma Community WEF, Eastern Cape | Cennergi | Project Manager & EAP |
| S24G and WULA for the Rectification for the commencement of unlawful activities on Ruimsig AH in Honeydew, Gauteng | Hossam Soror | Project Manager & EAP |
| S24G Application for the Rheboksfontein WEF, Western Cape | Ormonde - Theo Basson | Project Manager & EAP |
| S53 Application & WULA for Suurplaat and Gemini WEFs, Northern Cape | Engie | Project Manager & EAP |
| S53 Application for the Hopefield Community Wind Farm near Hopefield, Western Cape | Umoya Energy | Project Manager & EAP |
| S53 Application for the Project Blue WEF, Northern Cape | WWK Developments | Project Manager & EAP |
| S53 for the Oyster Bay WEF, Eastern Cape | RES | Project Manager & EAP |
| WULA for the Great Karoo Wind Farm, Northern Cape | African Clean Energy Developments (ACED) | Project Manager & EAP |

CONVENTIONAL POWER GENERATION PROJECTS (COAL)

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|--|--------------------|-----------------------|
| Mutsho Power Station near Makhado, Limpopo | Mutsho Consortium | Project Manager & EAP |
| Coal-fired Power Station near Ogies, Mpumalanga | Ruukki SA | Project Manager & EAP |
| Thabametsi IPP Coal-fired Power Station, near Lephalale, Limpopo | Axia | Project Manager & EAP |
| Transalloys Coal-fired Power Station, Mpumalanga | Transalloys | Project Manager & EAP |
| Tshivasho IPP Coal-fired Power Station (with WML), near Lephalale, Limpopo | Cennergi | Project Manager & EAP |
| Umbani Coal-fired Power Station, near Kriel, Mpumalanga | ISS Global Mining | Project Manager & EAP |

| Project Name & Location | Client Name | Role |
|---|------------------|-----------------------|
| Waterberg IPP Coal-Fired Power Station near Lephallale, Limpopo | Exxaro Resources | Project Manager & EAP |

Basic Assessments

| Project Name & Location | Client Name | Role |
|--|----------------|-----------------------|
| Coal Stockyard on Medupi Ash Dump Site, Limpopo | Eskom Holdings | Project Manager & EAP |
| Biomass Co-Firing Demonstration Facility at Arnot Power Station East of Middleburg, Mpumlanaga | Eskom Holdings | Project Manager & EAP |

Screening Studies

| Project Name & Location | Client Name | Role |
|---|----------------------------|-----------------------|
| Baseload Power Station near Lephallale, Limpopo | Cennergi | Project Manager & EAP |
| Coal-Fired Power Plant near Delmas, Mpumalanga | Exxaro Resources | Project Manager & EAP |
| Makhado Power Station, Limpopo | Mutsho Consortium, Limpopo | Project Manager & EAP |

Environmental Compliance, Auditing and ECO

| Project Name & Location | Client Name | Role |
|--|----------------|-----------------|
| ECO for the Camden Power Station, Mpumalanga | Eskom Holdings | Project Manager |

Compliance Advice

| Project Name & Location | Client Name | Role |
|---|-------------|-----------------------|
| Thabametsi IPP Coal-fired Power Station, near Lephallale, Limpopo | Axia | Environmental Advisor |

Environmental Permitting, S53, Water Use Licence (WUL), Waste Management Licence (WML) & Other Applications

| Project Name & Location | Client Name | Role |
|---|------------------|-----------------------|
| Permit application for the Thabametsi Bulk Water Pipeline, near Lephallale, Limpopo | Axia | Project Manager & EAP |
| S53 & WULA for the Waterberg IPP Coal-Fired Power Station near Lephallale, Limpopo | Exxaro Resources | Project Manager & EAP |
| S53 Application for the Tshivasho Coal-fired Power Station near Lephallale, Limpopo | Cennergi | Project Manager & EAP |

CONVENTIONAL POWER GENERATION PROJECTS (GAS)

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|---|----------------------------|-----------------------|
| Ankerlig OCGT to CCGT Conversion project & 400 kV transmission power line between Ankerlig and the Omega Substation, Western Cape | Eskom Holdings SoC Limited | Project Manager & EAP |
| Gourikwa OCGT to CCGT Conversion project & 400kV transmission power line between Gourikwa & Proteus Substation, Western Cape | Eskom Holdings SoC Limited | Project Manager & EAP |
| Richards Bay Gas to Power Combined Cycle Power Station, KwaZulu-Natal | Eskom Holdings SoC Limited | Project Manager & EAP |
| Richards Bay Gas to Power Plant, KwaZulu-Natal | Richards Bay Gas Power 2 | Project Manager & EAP |
| Decommissioning & Recommissioning of 3 Gas Turbine Units at Acacia Power Station & 1 Gas Turbine Unit at Port Rex Power Station to the existing | Eskom Holdings | Project Manager & EAP |

| Project Name & Location | Client Name | Role |
|--|-----------------------|-----------------------|
| Ankerlig Power Station in Atlantis Industria, Western Cape | | |
| 320MW gas-to-power station in Richards Bay, KwaZulu-Natal | Phinda Power Projects | Project Manager & EAP |

Screening Studies

| Project Name & Location | Client Name | Role |
|---|----------------------------|-----------------------|
| Fatal Flaw Analysis for 3 area identified for the establishment of a 500MW CCGT Power Station | Globeleq Advisors Limited | Project Manager & EAP |
| Richards Bay Gas to Power Combined Cycle Power Station, KwaZulu-Natal | Eskom Holdings SoC Limited | Project Manager & EAP |

GRID INFRASTRUCTURE PROJECTS

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|--|--------------------|-----------------------|
| Aggeneis-Oranjemond Transmission Line & Substation Upgrade, Northern Cape | Eskom Transmission | Project Manager & EAP |
| Ankerlig-Omega Transmission Power Lines, Western Cape | Eskom Transmission | Project Manager & EAP |
| Karoshhoek Grid Integration project as part of the Karoshhoek Solar Valley Development East of Upington, Northern Cape | FG Emvelo | Project Manager & EAP |
| Koeberg-Omega Transmission Power Lines,, Western Cape | Eskom Transmission | Project Manager & EAP |
| Koeberg-Stikland Transmission Power Lines, Western Cape | Eskom Transmission | Project Manager & EAP |
| Kyalami Strengthening Project, Gauteng | Eskom Transmission | Project Manager & EAP |
| Mokopane Integration Project, Limpopo | Eskom Transmission | Project Manager & EAP |
| Saldanha Bay Strengthening Project, Western Cape | Eskom Transmission | Project Manager & EAP |
| Steelpoort Integration Project, Limpopo | Eskom Transmission | Project Manager & EAP |
| Transmission Lines from the Koeberg-2 Nuclear Power Station site, Western Cape | Eskom Transmission | Project Manager & EAP |
| Tshwane Strengthening Project, Phase 1, Gauteng | Eskom Transmission | Project Manager & EAP |
| Main Transmission Substation (MTS) associated with the Choje Wind Farm cluster, Eastern Cape | Wind Relic | Project Manager & EAP |

Basic Assessments

| Project Name & Location | Client Name | Role |
|--|-----------------|-----------------------|
| Dassenberg-Koeberg Power Line Deviation from the Koeberg to the Ankerlig Power Station, Western Cape | Eskom Holdings | Project Manager & EAP |
| Golden Valley II WEF Power Line & Substation near Cookhouse, Eastern Cape | BioTherm Energy | Project Manager & EAP |
| Golden Valley WEF Power Line near Cookhouse, Eastern Cape | BioTherm Energy | Project Manager & EAP |
| Karoshhoek Grid Integration project as part of the Karoshhoek Solar Valley Development East of Upington, Northern Cape | FG Emvelo | Project Manager & EAP |

| Project Name & Location | Client Name | Role |
|--|--|-----------------------|
| Konkoonsies II PV SEF Power Line to the Paulputs Substation near Pofadder, Northern Cape | BioTherm Energy | Project Manager & EAP |
| Perdekraal West WEF Powerline to the Eskom Kappa Substation, Western Cape | BioTherm Energy | Project Manager & EAP |
| Rheboksfontein WEF Powerline to the Aurora Substation, Western Cape | Moyeng Energy | Project Manager & EAP |
| Soetwater Switching Station near Sutherland, Northern Cape | African Clean Energy Developments (ACED) | Project Manager & EAP |
| Solis Power I Power Line & Switchyard Station near Upington, Northern Cape | Brightsource | Project Manager & EAP |
| Stormwater Canal System for the Ilanga CSP near Upington, Northern Cape | Karoshhoek Solar One | Project Manager & EAP |
| Tsitsikamma Community WEF Powerline to the Diep River Substation, Eastern Cape | Eskom Holdings | Project Manager & EAP |
| Two 132kV Chickadee Lines to the new Zonnebloem Switching Station, Mpumalanga | Eskom Holdings | Project Manager & EAP |
| Electrical Grid Infrastructure for the Kolkies and Sadawa PV clusters, Western Cape | Mainstream Renewable Energy Developments | Project Manager & EAP |
| Sadawa Collector substation, Western Cape | Mainstream Renewable Energy Developments | Project Manager & EAP |
| Electrical Grid Infrastructure for the Vrede and Rondavel PV facilities, Free State | Mainstream Renewable Energy Developments | Project Manager & EAP |

Environmental Compliance, Auditing and ECO

| Project Name & Location | Client Name | Role |
|--|--|-----------------|
| ECO for the construction of the Ferrum-Mookodi Transmission Line, Northern Cape and North West | Trans-Africa Projects on behalf of Eskom | Project Manager |
| EO for the construction of the Gamma-Kappa Section A Transmission Line, Western Cape | Trans-Africa Projects on behalf of Eskom | Project Manager |
| EO for the construction of the Gamma-Kappa Section B Transmission Line, Western Cape | Trans-Africa Projects on behalf of Eskom | Project Manager |
| EO for the construction of the Hydra IPP Integration project, Northern Cape | Trans-Africa Projects on behalf of Eskom | Project Manager |
| EO for the construction of the Kappa-Sterrekus Section C Transmission Line, Western Cape | Trans-Africa Projects on behalf of Eskom | Project Manager |
| EO for the construction of the Namaqualand Strengthening project in Port Nolloth, Western Cape | Trans-Africa Projects on behalf of Eskom | Project Manager |
| ECO for the construction of the Neptune Substation Soil Erosion Mitigation Project, Eastern Cape | Eskom | Project Manager |
| ECO for the construction of the Ilanga-Gordonia 132kV power line, Northern Cape | Karoshhoek Solar One | Project Manager |

Environmental Permitting, S53, Water Use Licence (WUL), Waste Management Licence (WML) & Other Applications

| Project Name & Location | Client Name | Role |
|--|--------------------|-----------------------|
| Environmental Permitting and WULA for the Rockdale B Substation & Loop in Power Lines, | Eskom Holdings | Project Manager & EAP |
| Environmental Permitting and WULA for the Steelpoort Integration project, Limpopo | Eskom Holdings | Project Manager & EAP |
| Environmental Permitting for Solis CSP near Upington, Northern Cape | Brightsource | Project Manager & EAP |

MINING SECTOR PROJECTS

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|--|---------------------------|-----------------------|
| Elitheni Coal Mine near Indwe, Eastern Cape | Elitheni Coal | Project Manager & EAP |
| Groot Letaba River Development Project Borrow Pits | Iiso | Project Manager & EAP |
| Grootegeluk Coal Mine for coal transportation infrastructure between the mine and Medupi Power Station (EMPr amendment), Limpopo | Eskom Holdings | Project Manager & EAP |
| Waterberg Coal Mine (EMPr amendment), Limpopo | Seskoko Resources | Project Manager & EAP |
| Aluminium Plant WML & AEL, Gauteng | GfE-MIR Alloys & Minerals | Project Manager & EAP |

Basic Assessments

| Project Name & Location | Client Name | Role |
|---|--------------------|-----------------------|
| Rare Earth Separation Plant in Vredendal, Western Cape | Rareco | Project Manager & EAP |
| Decommissioning and Demolition of Kilns 5 & 6 at the Slurry Plant, Kwa-Zulu Natal | PPC | Project Manager & EAP |

Environmental Compliance, Auditing and ECO

| Project Name & Location | Client Name | Role |
|---|----------------------------|-----------------|
| ECO for the construction of the Duhva Mine Water Recovery Project, Mpumalanga | Eskom Holdings SoC Limited | Project Manager |
| External compliance audit of Palesa Coal Mine's Integrated Water Use License (IWUL), near KwaMhlanga, Mpumalanga | HCI Coal | Project Manager |
| External compliance audit of Palesa Coal Mine's Waste Management License (WML) and EMP, near KwaMhlanga, Mpumalanga | HCI Coal | Project Manager |
| External compliance audit of Mbali Coal Mine's Integrated Water Use License (IWUL), near Ogies, Mpumalanga | HCI Coal | Project Manager |
| Independent External Compliance Audit of Water Use License (WUL) for the Tronox Namakwa Sands (TNS) Mining Operations (Brand se Baai), Western Cape | Tronox Namakwa Sands | Project Manager |
| Independent External Compliance Audit of Water Use License (WUL) for the Tronox Namakwa Sands (TNS) Mineral Separation Plant (MSP), Western Cape | Tronox Namakwa Sands | Project Manager |
| Independent External Compliance Audit of Water Use License (WUL) for the Tronox Namakwa Sands (TNS) Smelter Operations (Saldanha), Western Cape | Tronox Namakwa Sands | Project Manager |
| Compliance Auditing of the Waste Management Licence for the PetroSA Landfill Site at the GTL Refinery, Western Cape | PetroSA | Project Manager |

Environmental Permitting, S53, Water Use Licence (WUL), Waste Management Licence (WML) & Other Applications

| Project Name & Location | Client Name | Role |
|--|--------------------|-----------------------|
| Waste Licence Application for the Rare Earth Separation Plant in Vredendal, Western Cape | Rareco | Project Manager & EAP |

| | | |
|--|---------------------------|-----------------------|
| WULA for the Expansion of the Landfill site at Exxaro's Namakwa Sands Mineral Separation Plant, Western Cape | Exxaro Resources | Project Manager & EAP |
| S24G & WML for an Aluminium Plant, Gauteng | GfE-MIR Alloys & Minerals | Project Manager & EAP |

INFRASTRUCTURE DEVELOPMENT PROJECTS (BRIDGES, PIPELINES, ROADS, WATER RESOURCES, STORAGE, ETC)

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|--|--|-----------------------|
| Bridge across the Ngotwane River, on the border of South Africa and Botswana | Eskom Holdings | Project Manager & EAP |
| Chemical Storage Tanks, Metallurgical Plant Upgrade & Backfill Plant upgrade at South Deep Gold Mine, near Westonia, Gauteng | Goldfields | Project Manager & EAP |
| Expansion of the existing Welgedacht Water Care Works, Gauteng | ERWAT | Project Manager & EAP |
| Golden Valley WEF Access Road near Cookhouse, Eastern Cape | BioTherm Energy | Project Manager & EAP |
| Great Fish River Wind Farm Access Roads and Watercourse Crossings near Cookhouse, Eastern Cape | African Clean Energy Developments (ACED) | Project Manager & EAP |
| Ilanga CSP Facility Watercourse Crossings near Upington, Northern Cape | Karoshhoek Solar one | Project Manager & EAP |
| Modification of the existing Hartebeestfontein Water Care Works, Gauteng | ERWAT | Project Manager & EAP |
| N10 Road Realignment for the Ilanga CSP Facility, East of Upington, Northern Cape | SANRAL | Project Manager & EAP |
| Nxuba (Bedford) Wind Farm Watercourse Crossings near Cookhouse, Eastern Cape | African Clean Energy Developments (ACED) | Project Manager & EAP |
| Pollution Control Dams at the Medupi Power Station Ash Dump & Coal Stockyard, Limpopo | Eskom | Project Manager & EAP |
| Qoboshane borrow pits (EMPr only), Eastern Cape | Emalahleni Local Municipality | Project Manager & EAP |
| Tsitsikamma Community WEF Watercourse Crossings, Eastern Cape | Cennergi | Project Manager & EAP |
| Clayville Central Steam Plant, Gauteng | Bellmall Energy | Project Manager & EAP |
| Msenge Emoyeni Wind Farm Watercourse Crossings and Roads, Eastern Cape | Windlab | Project Manager & EAP |

Basic Assessments

| Project Name & Location | Client Name | Role |
|--|-------------------------------|-----------------------|
| Harmony Gold WWTW at Doornkop Mine, Gauteng | Harmony Doornkop Plant | Project Manager & EAP |
| Ofir-ZX Watercourse Crossing for the Solar PV Facility, near Keimoes, Northern Cape | Networx S28 Energy | Project Manager & EAP |
| Qoboshane bridge & access roads, Eastern Cape | Emalahleni Local Municipality | Project Manager & EAP |
| Relocation of the Assay Laboratory near Carletonville, Gauteng | Sibanye Gold | Project Manager & EAP |
| Richards Bay Harbour Staging Area, KwaZulu-Natal | Eskom Holdings | Project Manager & EAP |
| S-Kol Watercourse Crossing for the Solar PV Facility, East of Keimoes, Northern Cape | Networx S28 Energy | Project Manager & EAP |
| Sonnenberg Watercourse Crossing for the Solar PV Facility, West Keimoes, Northern Cape | Networx S28 Energy | Project Manager & EAP |

| Project Name & Location | Client Name | Role |
|--|--|-----------------------|
| Kruisvallei Hydroelectric Power Generation Scheme, Free State | Building Energy | Project Manager & EAP |
| Masetjaba Water Reservoir, Pump Station and Bulk Supply Pipeline near Nigel, Gauteng | Naidu Consulting Engineers | Project Manager & EAP |
| Access Road for the Dwarsug Wind Farm, Northern Cape Province | South Africa Mainsteam Renewable Power | Project Manager & EAP |

Screening Studies

| Project Name & Location | Client Name | Role |
|---|-----------------------------|-----------------------|
| Roodepoort Open Space Optimisation Programme (OSOP) Precinct, Gauteng | TIMAC Engineering Projects | Project Manager & EAP |
| Vegetable Oil Plant and Associated Pipeline, Kwa-Zulu Natal | Wilmar Oils and Fats Africa | Project Manager & EAP |

Environmental Compliance, Auditing and ECO

| Project Name & Location | Client Name | Role |
|--|---|-------------------------|
| ECO and bi-monthly auditing for the construction of the Olifants River Water Resources Development Project (ORWRDP) Phase 2A: De Hoop Dam, R555 realignment and housing infrastructure | Department of Water and Sanitation | Project Manager Auditor |
| ECO for the Rehabilitation of the Blaaupan & Storm Water Channel, Gauteng | Airports Company of South Africa (ACSA) | Project Manager |
| Due Diligence reporting for the Better Fuel Pyrolysis Facility, Gauteng | Better Fuels | Project Manager |
| ECO for the Construction of the Water Pipeline from Kendal Power Station to Kendal Pump Station, Mpumalanga | Transnet | Project Manager |
| ECO for the Replacement of Low-Level Bridge, Demolition and Removal of Artificial Pong, and Reinforcement the Banks of the Crocodile River at the Construction at Walter Sisulu National Botanical Gardens, Gauteng Province | South African National Biodiversity Institute (SANBI) | Project Manager |
| External Compliance Audit of the Air Emission Licence (AEL) for a depot in Bloemfontein, Free State Province and in Tzaneen, Mpumalanga Province | PetroSA | Project Manager |

Environmental Permitting, S53, Water Use Licence (WUL), Waste Management Licence (WML) & Other Applications

| Project Name & Location | Client Name | Role |
|--|---|-----------------------|
| WULA for the Izubulo Private Nature Reserve, Limpopo | Kjell Bismeyer, Jann Bader, Laurence Saad | Project Manager & EAP |
| WULA for the Masodini Private Game Lodge, Limpopo | Masodini Private Game Lodge | Environmental Advisor |
| WULA for the Ezulwini Private Nature Reserve, Limpopo | Ezulwini Investments | Project Manager & EAP |
| WULA for the Masodini Private Game Lodge, Limpopo | Masodini Private Game Lodge | Project Manager & EAP |
| WULA for the N10 Realignment at the Ilanga SEF, Northern Cape | Karoshhoek Solar One | Project Manager & EAP |
| WULA for the Kruisvallei Hydroelectric Power Generation Scheme, Free State | Building Energy | Project Manager & EAP |

| Project Name & Location | Client Name | Role |
|--|--------------------------|-----------------------|
| S24G and WULA for the illegal construction of structures within a watercourse on EFF 24 Ruimsig Agricultural Holdings, Gauteng | Sorrer Language Services | Project Manager & EAP |

HOUSING AND URBAN PROJECTS

Basic Assessments

| Project Name & Location | Client Name | Role |
|--|-------------|-----------------------|
| Postmasburg Housing Development, Northern Cape | Transnet | Project Manager & EAP |

Compliance Advice and reporting

| Project Name & Location | Client Name | Role |
|---|---------------------------|-----------------------|
| Kampi ya Thude at the Olifants West Game Reserve, Limpopo | Nick Elliot | Environmental Advisor |
| External Compliance Audit of WUL for the Johannesburg Country Club, Gauteng | Johannesburg Country Club | Project Manager |

Environmental Compliance, Auditing and ECO

| Project Name & Location | Client Name | Role |
|---|--|-----------------|
| Due Diligence Audit for the Due Diligence Audit Report, Gauteng | Delta BEC (on behalf of Johannesburg Development Agency (JDA)) | Project Manager |

ENVIRONMENTAL MANAGEMENT TOOLS

| Project Name & Location | Client Name | Role |
|---|---|-----------------------|
| Development of the 3rd Edition Environmental Implementation Plan (EIP) | Gauteng Department of Agriculture and Rural Development (GDARD) | Project Manager & EAP |
| Development of Provincial Guidelines on 4x4 routes, Western Cape | Western Cape Department of Environmental Affairs and Development Planning | EAP |
| Compilation of Construction and Operation EMP for the Braamhoek Transmission Integration Project, Kwazulu-Natal | Eskom Holdings | Project Manager & EAP |
| Compilation of EMP for the Wholesale Trade of Petroleum Products, Gauteng | Munaca Technologies | Project Manager & EAP |
| Operational Environmental Management Programme (OEMP) for Medupi Power Station, Limpopo | Eskom Holdings | Project Manager & EAP |
| Operational Environmental Management Programme (OEMP) for the Dube TradePort Site Wide Precinct | Dube TradePort Corporation | Project Manager & EAP |
| Operational Environmental Management Programme (OEMP) for the Kusile Power Station, Mpumalanga | Eskom Holdings | Project Manager & EAP |
| Review of Basic Assessment Process for the Wittekleibosch Wind Monitoring Mast, Eastern Cape | Exxaro Resources | Project Manager & EAP |
| Revision of the EMP for the Sirius Solar PV | Aurora Power Solutions | Project Manager & EAP |

| Project Name & Location | Client Name | Role |
|---|---|-----------------------|
| State of the Environment (SoE) for Emalahleni Local Municipality, Mpumalanga | Simo Consulting on behalf of Emalahleni Local Municipality | Project Manager & EAP |
| Aspects and Impacts Register for Salberg Concrete Products operations | Salberg Concrete Products | EAP |
| First State of Waste Report for South Africa | Golder on behalf of the Department of Environmental Affairs | Project Manager & EAP |
| Responsibilities Matrix and Gap Analysis for the Kruisvallei Hydroelectric Power Generation Scheme, Free State Province | Building Energy | Project Manager |
| Responsibilities Matrix and Gap Analysis for the Roggeveld Wind Farm, Northern & Western Cape Provinces | Building Energy | Project Manager |

PROJECTS OUTSIDE OF SOUTH AFRICA

| Project Name & Location | Client Name | Role |
|---|--------------------|-----------------------|
| Advisory Services for the Zizabona Transmission Project, Zambia, Zimbabwe, Botswana & Namibia | PHD Capital | Advisor |
| EIA for the Semonkong WEF, Lesotho | MOSCET | Project Manager & EAP |
| EMP for the Kuvaninga Energia Gas Fired Power Project, Mozambique | ADC (Pty) Ltd | Project Manager & EAP |
| Environmental Screening Report for the SEF near Thabana Morena, Lesotho | Building Energy | EAP |
| EPBs for the Kawambwa, Mansa, Mwense and Nchelenge SEFs in Luapula Province, Zambia | Building Energy | Project Manager & EAP |
| ESG Due Diligence for the Hilton Garden Inn Development in Windhoek, Namibia | Vatange Capital | Project Manager |
| Mandahill Mall Rooftop PV SEF EPB, Lusaka, Zambia | Building Energy | Project Manager & EAP |
| Monthly ECO for the PV Power Plant for the Mocuba Power Station | Scatec | Project Manager |

CURRICULUM VITAE OF KAREN JODAS

| | |
|-------------------------------|--|
| Profession: | Environmental Management and Compliance Consultant; Environmental Assessment Practitioner. Professional Natural Scientist: Environmental Science since 1999. |
| Specialisation: | Strategic environmental assessment and advice; development of plans and guidelines; environmental compliance advise and monitoring; Environmental Impact Assessment; environmental management; project management and co-ordination of environmental projects; peer review; policy, strategy and guideline formulation; renewable energy projects; water resources management. |
| Years work experience: | 25 years (in the field since 1997) |

VOCATIONAL EXPERIENCE

Provide technical input for projects in the environmental management field, specialising in strategic evaluation, Environmental Impact Assessment studies, environmental management plans, programmes and guidelines, integrated environmental management, environmental compliance monitoring; peer review of EIA reports and processes, strategy and guideline development, and public participation. Key focus on overall Project Management, integration of environmental studies and environmental processes into larger engineering-based projects, strategic assessment, and the identification of environmental management solutions and mitigation/risk minimising measures.

Excellent working knowledge of environmental legislation, strategies, guidelines and policies. Compilation of the reports for environmental studies are in accordance with the all relevant environmental legislation under the National Environmental Management Act. Due consideration of Equator Principles and compliance with IFC performance standards is now a part of all projects.

SKILLS BASE AND CORE COMPETENCIES

Provide technical input for projects in the environmental management field, specialising in strategic evaluation, Environmental Impact Assessment studies, environmental management plans, programmes and guidelines, integrated environmental management, environmental compliance monitoring; peer review of EIA reports and processes, strategy and guideline development, and public participation. Key focus on overall Project Management, integration of environmental studies and environmental processes into larger engineering-based projects, strategic assessment, and the identification of environmental management solutions and mitigation/risk minimising measures.

Excellent working knowledge of environmental legislation, strategies, guidelines and policies. Compilation of the reports for environmental studies are in accordance with the all relevant environmental legislation under the National Environmental Management Act. Due consideration of Equator Principles and compliance with IFC performance standards is now a part of all projects.

SKILLS BASE AND CORE COMPETENCIES

- Twenty five years (25) of experience in the environmental management, environmental permitting, impact assessment and compliance fields
- Twenty three (23) years of experience in Project Management of large environmental assessment and environmental management projects
- Strategic and compliance advise for all aspects of environmental assessment and management

- Wide range of experience for public and private sector projects
- Key experience in the assessment of impacts associated with renewable energy projects
- Experienced in assessments for both linear developments and nodal developments
- Experienced consultant in projects in Sub-Saharan Africa
- Experienced in environmental compliance advice, monitoring and reporting for construction and operation projects
- Due diligence auditing and reporting
- External and peer review of environmental assessment and compliance reporting as well as EIA processes
- Working knowledge of environmental planning policies, regulatory frameworks and legislation
- Input and review of Environmental Management Plans and Programmes, including Invasive Species Monitoring, Control and Eradication Plans
- Identification and assessment of potential environmental impacts and benefits
- Development of practical and achievable mitigation measures and management plans and evaluation of risk to project execution
- Compilation and review of the reports in accordance with all relevant environmental legislation
- Public participation/involvement and stakeholder consultation
- Environmental strategy, policy and guidelines development.

EDUCATION AND PROFESSIONAL STATUS

Degrees:

- B.Sc Earth Sciences, majoring in Geography and Zoology, Rhodes University, Grahamstown, 1993
- B.Sc Honours in Geography (in Environmental Water Management), Rhodes University, Grahamstown, 1994. Major subjects included Water Resources Management, Streams Ecology, Fluvial Geomorphology and Geographic Information Systems.
- M.Sc in Geography (Geomorphology), Rhodes University, Grahamstown, 1996

Short Courses:

- Environmental and Social Risk Management (ESRM), International Finance Corporation, 2018
- Integrated Water Resource Management, the National Water Act, and Water Use Authorisations, CSBSS, 2017
- WindFarmer Wind Farm Design course, Garrad Hassan, 2009
- Environmental Law Course, Aldo Leopold Institute, 2002
- Water Quality Management, Potchefstroom University, 1998

Professional Society Affiliations:

- Registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA) (2022/5499)
- Registered with the South African Council for Natural Scientific Professions as a Professional Natural Scientist: Environmental Science (400106/99)
- Registered with the International Associated for Impact Assessment South Africa (IAIASa): 5888

Other Relevant Skills:

- Xtrack Extreme – Advanced Off-Road Driving Course

EMPLOYMENT

| Date | Company | Roles and Responsibilities |
|-----------------|----------------------------------|---|
| 2006 - Current: | Savannah Environmental (Pty) Ltd | Director <i>Independent specialist environmental consultant, Environmental Assessment Practitioner (EAP) and advisor</i> <u>Tasks include:</u> <ul style="list-style-type: none"> • Project management. |

| Date | Company | Roles and Responsibilities |
|--------------|---|---|
| | | <ul style="list-style-type: none"> • Environmental screening assessments, environmental permitting and environmental authorisation applications. • Due Diligence reporting • Water use authorisation applications on the e-WULAA system. • EA amendment applications. • Environmental compliance audits. • Efficient and quality reporting in line with the requirements of the National Environmental Management Act, EIA Regulations, and other relevant environmental legislation. • Execution of the public participation process. • Professional client liaison. |
| 1997 – 2005: | Bohlweki Environmental (Pty) Ltd (later known as Royal Haskoning DHV; or RHDHV) | Associate Environmental Management Unit: Manager; Principle Environmental Scientist focussing on Environmental Management and Project Management |

PROJECT EXPERIENCE

Proven track record of successfully consulting on a range of development projects in all nine Provinces of South Africa, as well as in neighbouring southern African countries.

Her experience includes projects in the energy generation and transmission sector, as well as wastewater treatment facilities, mining and prospecting activities, property development, national roads, as well as strategy and guidelines development.

Karen Jodas has played a significant role in the energy sector since 2007, specifically in the roll-out of renewable energy projects throughout southern Africa. She has provided consulting services to over 400 renewable and baseload energy applications submitted by Independent Power Producers (IPPs) to the Department of Forestry, Fisheries and the Environment in South Africa for authorisation, as well as to Eskom on their renewable energy and gas-to-energy projects. In addition, she has concluded the environmental permitting and/or due diligence auditing for the development and implementation of 42 projects selected as preferred bidders by the Department of Energy under the Renewable Energy Independent Power Producers Procurement (REIPPP) Programme (small- and large-scale projects).

GRID INFRASTRUCTURE PROJECTS

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|--|--------------------|-----------------------|
| Kyalami/Midrand Substation and 3 Transmission Lines, Gauteng | Eskom Transmission | Project Manager & EAP |
| Steelpoort Integration Project, Limpopo | Eskom Transmission | Project Manager & EAP |

Basic Assessments

| Project Name & Location | Client Name | Role |
|---|---|-----------------------|
| Amakhala Emoyeni Power Line & Kopleegte Substation, Eastern Cape | Cennergi | Project Manager & EAP |
| Bon Espirange Substation & Overhead Power Line for the Roggeveld Wind Farm, Northern Cape | Building Energy (G7 Renewable Energies) | Project Manager & EAP |
| Castle WEF Powerline, Northern Cape | Juwi Renewable Energies | Project Manager & EAP |
| Cuprum-Burchell; Burchell-Mooidraai Power Line, Northern Cape | Eskom | Project Manager & EAP |

| | | |
|--|--|-----------------------|
| Expansion of the Komsberg Main Transmission Substation, Northern Cape | Enel Green Power | Project Manager & EAP |
| Garob-Kronos Power Line, Northern Cape | Juwi Renewable Energies | Project Manager & EAP |
| Golden Valley Dx-Poseidon Power Line Substation & Golden Valley-Kopleegte Power Line, Eastern Cape | BioTherm Energy | Project Manager & EAP |
| Gunstfontein Switching Station, Power Line & Ancillary Infrastructure, Northern Cape | African Clean Energy Developments (ACED) | Project Manager & EAP |
| Ilanga Lethemba-Hydra, Northern Cape | Solar Capital | Project Manager & EAP |
| Iziduli Emoyeni WEF on-site substation, Power Line & Switching station, Access Roads & Watercourse Crossings, Eastern Cape | Windlab | Project Manager & EAP |
| Khai-Ma WEF Power Line, Northern Cape | Mainstream Renewable | Project Manager & EAP |
| Korana WEF Power Line, Northern Cape | Mainstream Renewable | Project Manager & EAP |
| Korana SEF Power Line, Northern Cape | Mainstream Renewable | Project Manager & EAP |
| Nobelsfontein WEF Power Line & Substation, Northern Cape | Coria / SARGE | Project Manager & EAP |
| Nojoli WEF Substation & Power Line Grid Connection, Eastern Cape | African Clean Energy Developments (ACED) | Project Manager & EAP |
| Olifantshoek Substation & Powerline, Northern Cape | Eskom Holdings | Project Manager & EAP |
| Poortjies WEF Power Line, Northern Cape | Mainstream Renewable | Project Manager & EAP |
| Power Line & Substation for the Blackwood WEF, Northern Cape | VentuSA Energy | Project Manager & EAP |
| Power Line & Substation for the Khobab WEF in Loeriesfontein, Northern Cape | Mainstream Renewable | Project Manager & EAP |
| Power Line Connecting the Sishen SEF to the Ferrum MTS-UMTU Klip Kop Power Line, Northern Cape | Acciona (Windfall 59 Properties) | Project Manager & EAP |
| Power Line for the Grid Connection of the 2 SEF's near Kath and Dibeng, Northern Cape | VentuSA Energy | Project Manager & EAP |
| Power Line for the Rhebokfontein WEF, Western Cape | Moyeng Energy | Project Manager & EAP |
| Power Line from Aggeney's Solar One to Aggeney's MTS Substation, Northern Cape | BlueWave | Project Manager & EAP |
| Re-alignment of 3 Eskom Power Line Servitudes within the Hopefield WEF, Western Cape | Umoya Energy | Project Manager & EAP |
| Re-alignment of the Power Line & Watercourse Crossings for the Loeriesfontein 2 WEF, Northern Cape | Mainstream Renewable | Project Manager & EAP |
| Re-alignment of the Power Line from Loeriesfontein 1 WEF to the Helios Substation, Northern Cape | Mainstream Renewable | Project Manager & EAP |
| Re-alignment of the Power Line from Loeriesfontein 3 WEF to the Helios Substation, Northern Cape | Mainstream Renewable | Project Manager & EAP |
| Substation for the Aggeney's PV SEF, Northern Cape | BioTherm Energy | Project Manager & EAP |
| Substation, Power Line & Watercourse Crossings for the Springfontein WEF, Free State | Mainstream Renewable | Project Manager & EAP |
| Wesley-Peddie (Riverbank Phase 2) Power Line for the Uncedo Lwethu WEF, Eastern Cape | Just Energy | Project Manager & EAP |

Environmental Compliance, Auditing and ECO

| Project Name & Location | Client Name | Role |
|---|--|-----------------|
| EO for the construction of the Neptune-Vuyani Transmission Line, Western Cape | Trans-Africa Projects on behalf of Eskom | Project Manager |

RENEWABLE POWER GENERATION PROJECTS: PHOTOVOLTAIC SOLAR ENERGY FACILITIES

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|---|--|-----------------------|
| Aggeney's PV Plant, Northern Cape | Solar Capital | Project Manager & EAP |
| Blackwood PV SEF, Free State | VentuSA Energy | Project Manager & EAP |
| Bloemsmond PV 1 & PV 2 SEF's, Northern Cape | Atlantic Energy Partners | Project Manager & EAP |
| Bosjesmansberg PV SEF, Northern Cape | Networx | Project Manager & EAP |
| Boundary PV SEF, Northern Cape | VentuSA Energy | Project Manager & EAP |
| Buffels PV 1 & PV 2 SEF's, North West | Kabi Energy | Project Manager & EAP |
| De Aar PV SEF, Northern Cape | African Clean Energy Developments (ACED) | Project Manager & EAP |
| De Aar PV Solar Energy Plant, Northern Cape | Solar Capital | Project Manager & EAP |
| Gihon & Kison PV SEF's, Limpopo | Networx | Project Manager & EAP |
| Gunstfontein PV SEF, Northern Cape | Networx / Prana Energy | Project Manager & EAP |
| Harmony Eland, Nyala & Tshepong PV SEF's, Free State | BEEEntropie Renewable Innovation | Project Manager & EAP |
| Hibernia SEF, North West | EA Energy | Project Manager & EAP |
| Iziko PV SEF, Mpumalanga | VentuSA Energy | Project Manager & EAP |
| Kabi Kimberley PV Facility at DeBeers, Northern Cape | Kabi Solar | Project Manager & EAP |
| Karoo Renewables PV SEF, Northern Cape | SARGE | Project Manager & EAP |
| Kheis Phase 1, 2 & 3 PV SEF, Northern Cape | GeStamp Solar | Project Manager & EAP |
| Klipgat PV SEF, Northern Cape | Terra Solar | Project Manager & EAP |
| Loeriesfontein/Helios PV SEF, Northern Cape | Solar Capital | Project Manager & EAP |
| Naauwpoort PV SEF, Northern Cape | Terra Solar | Project Manager & EAP |
| Orkney PV SEF, North West | Genesis Eco-Energy | Project Manager & EAP |
| Pofadder SEF, Northern Cape | Mainstream Renewable | Project Manager & EAP |
| Prieska North PV SEF, Northern Cape | VentuSA Energy | Project Manager & EAP |
| Prieska PV SEF, Northern Cape | VentuSA Energy | Project Manager & EAP |
| Ritchie PV SEF, Northern Cape | Solar Capital | Project Manager & EAP |
| San Solar PV SEF, Northern Cape | VentuSA Energy | Project Manager & EAP |
| Sirius (Tungston Lodge) PV Solar Plants (x2, Northern Cape) | Aurora Power Solutions | Project Manager & EAP |
| Sol Invictus x4 PV Developments, Northern Cape | Building Energy | Project Manager & EAP |
| Solar Plant at Kathu (Wincanton), Northern Cape | REISA | Project Manager & EAP |
| Solar Plant at Sishen (Wincanton), Northern Cape | VentuSA Energy | Project Manager & EAP |
| Solar Plant at Sishen (Wincanton), Northern Cape | VentuSA Energy | Project Manager & EAP |
| SolarReserve Kotulo Tsatsi PV1 SEF, Northern Cape | Kotulo Tsatsi Energy and SolarReserve South Africa | Project Manager & EAP |
| SolarReserve Kotulo Tsatsi PV2 Facility, Northern Cape province | Kotulo Tsatsi Energy and SolarReserve South Africa | Project Manager & EAP |
| Stormberg Solar PV SEF, Eastern Cape | Networx / Prana Energy | Project Manager & EAP |
| Tewa Isitha (Grootdrink/Albany) PV SEF, Northern Cape | Africoast Engineers | Project Manager & EAP |
| Tiger Kloof PV SEF near Vryburg, North West | Kabi Energy | Project Manager & EAP |
| Tiger Solar PV SEF, Northern Cape | Kabi Energy | Project Manager & EAP |
| Vaalkop and Witkop PV SEF's, North West | Kabi Solar | Project Manager & EAP |
| Wagnbrietjiespan PV SEF, Free State | VentuSA | Project Manager & EAP |

| Project Name & Location | Client Name | Role |
|--|-------------------------------------|-----------------------|
| Wolmaransstad Municipality PV SEF, North West | BlueWave | Project Manager & EAP |
| Woodhouse PV 1 & PV 2 SEFs, North West | Genesis Eco-Energy | Project Manager & EAP |
| Zuurwater PV SEFs (x4), Northern Cape | Solafrica / BlueWave | Project Manager & EAP |
| Lichtenburg 1, 2 & 3 PV Facilities, North West | Atlantic Energy Partners & ABO Wind | Project Manager & EAP |
| Allepad PV One, Two, Three and Four PV SEFs | ILEnergy Development | Project Manager & EAP |

Basic Assessments

| Project Name & Location | Client Name | Role |
|--|--|-----------------------|
| Amandla Welanga & Dida PV SEFs near Noupoot, Northern Cape | Terra Solar | Project Manager & EAP |
| Carolusberg PV SEF, Northern Cape | Ilio Energy (SARGE) | Project Manager & EAP |
| Gosforth Park and Kynoch Rooftop PV SEF's Northern Cape | Building Energy | Project Manager & EAP |
| Hennenman PV SEF, Free State | BlueWave | Project Manager & EAP |
| Hibernia PV SEF near Lichtenburg, North West | EA Energy | Project Manager & EAP |
| Inkulukelo PV SEF, Northern Cape | Terra Solar | Project Manager & EAP |
| Kabi Kimberley PV SEF, Northern Cape | Kabi Energy | Project Manager & EAP |
| Kokerboom & Boabab PV Solar Energy Plants, Northern Cape | Brax Energy | Project Manager & EAP |
| Middelburg PV SEF, Mpumalanga | African Clean Energy Developments (ACED) | Project Manager & EAP |
| Nigramoep PV Solar Energy Plant, Northern Cape | SARGE | Project Manager & EAP |
| Noupoot (Kleinfontein and Toitdale) CPV, Northern Cape | Terra Power | Project Manager & EAP |
| O'Kiep 1 PV Solar Energy Plant, Northern Cape | Ilio Energy (SARGE) | Project Manager & EAP |
| O'Kiep 2 PV Solar Energy Plant, Northern Cape | BluePort Trade 118 (SARGE) | Project Manager & EAP |
| O'Kiep 3 PV Solar Energy Plant, Northern Cape | Ilio Energy (SARGE) | Project Manager & EAP |
| Rodicon PV SEF, Mpumalanga | VentuSA Energy | |
| Slurry PV SEF, North West | PPC | Project Manager & EAP |
| Small projects for PV SEF's, North West | BlueWave | Project Manager & EAP |
| Son Citrus Rooftop PV Installation, Eastern Cape | Building Energy | Project Manager & EAP |
| Tollie PV SEF, Northern Cape | Terra Solar | Project Manager & EAP |
| x2 Southern Farms PV Solar Energy Plants, Northern Cape | Southern Farms | Project Manager & EAP |
| Moeding Solar PV Facility (BA in terms of REDZ regs), North West | Kabi Energy | Project Manager & EAP |

Screening Studies

| Project Name & Location | Client Name | Role |
|---|--|-----------------------|
| Allemans, Wonderheuwel, Damfontein & Dida PV SEF's, Northern Cape | Terra Solar | Project Manager & EAP |
| Amandla Welang, Gillmer & Inkululeko PV SEF's, Northern Cape | GeoSolar/ TerraSolar | Project Manager & EAP |
| Blouputs PV, Onseepkans PV, Hoogelegen PV & Boegoeberg PV projects, Northern Cape | Engineering Development Industrial Projects (EDIP) | Project Manager & EAP |
| Bobididi PV SEF, Limpopo | Root 60Four Energy | Project Manager & EAP |
| Boshof-Les Marais / Buitenfontein SEF, Free State | Bluewave Capital | Project Manager & EAP |
| Bosjesmansberg PV SEF, Northern Cape | Networx | Project Manager & EAP |

| Project Name & Location | Client Name | Role |
|--|--|-----------------------|
| Class 2 & Class 3 Road Networks in the vicinity of the proposed Tambo Springs Freight Hub, Gauteng | SMEC South Africa (on behalf of Gauteng Department of Roads & Transport) | Project Manager & EAP |
| Hibernia SEF, North West | EA Energy | Project Manager & EAP |
| Lephalale PV SEF, Limpopo | Exxaro | Project Manager & EAP |
| Prieska PV SEF, Northern Cape | Terra Solar | Project Manager & EAP |
| Solar Project near Vryburg, North West province | ABO Wind | Project Manager & EAP |
| PV SEF's (x15) for the projects for the REIPP small scale BID, Nationwide | Building Energy | Project Manager & EAP |
| Senekal 1 & 2, Pongola & Newcastle PV SEF's, Kwa-Zulu-Natal | Building Energy | Project Manager & EAP |
| Small scale PV SEF project - 2nd Stage One | Bluewave Capital | Project Manager & EAP |
| Small scale PV SEF project - 2nd Stage One | Building Energy | Project Manager & EAP |
| Stella Helpmekaar SEF, North West | Bluewave Capital | Project Manager & EAP |
| Wolmaransstad Municipality SEF, North West | Bluewave Capital | Project Manager & EAP |
| Solar Project near Beaufort West, Western Cape | ABO Wind | Project Manager & EAP |
| Solar Project near Lichtenburg, Western Cape | ABO Wind | Project Manager & EAP |
| Solar Project near Hotazel, Western Cape | ABO Wind | Project Manager & EAP |
| Small-scale solar PV development site in Ekurhuleni Metropolitan Municipality, Gauteng | Genesis Eco-Energy Developments | Project Manager & EAP |

Environmental Compliance, Auditing and ECO

| Project Name & Location | Client Name | Role |
|--|-------------------------|-----------------|
| ECO for the Contraction of the De Aar & Prieska PV Facilities, Northern Cape | GeStamp | Project Manager |
| ECO for the Construction of the Kathu PV Facility, Northern Cape | REISA / Building Energy | Project Manager |

Compliance Advice and ESAP Reporting

| Project Name & Location | Client Name | Role |
|--|-------------------------|-----------------------|
| ACWA Power SolarReserve Redstone Solar Plant, Northern Cape | SolarReserve | Environmental Advisor |
| Bokpoort PV SEF, Northern Cape | Solafrica | Environmental Advisor |
| Boshof PV SEF, Free State | BlueWave | Environmental Advisor |
| Hennenman PV SEF, Free State | BlueWave | Environmental Advisor |
| Kathu II SEF, Northern Cape | Building Energy | Environmental Advisor |
| Kathu PV SEF, Northern Cape | Building Energy / REISA | Environmental Advisor |
| Prieska PV SEF, Northern Cape | VentuSA | Environmental Advisor |
| San Solar SEF, Northern Cape | VentuSA / Acciona | Environmental Advisor |
| Sishen PV SEF Phase 1, Northern Cape | Aveng / Acciona | Environmental Advisor |
| Wolmaransstad Municipality Solar PV SEF, North West | BlueWave | Environmental Advisor |
| ESAP reporting for the operation phase of the Mulilo Solar PV De Aar and Mililo Solar PV Prieska | Mulilo and X-Elio | Environmental Advisor |

Due Diligence Reporting

| Project Name & Location | Client Name | Role |
|---|----------------------------------|-----------------------|
| Kabi Kimberley PV Plant, Northern Cape | Enertis Solar | Environmental Advisor |
| Sishen Solar Farm, Northern Cape | Acciona (Windfall 59 Properties) | Environmental Advisor |
| Vaal River Solar 1 PV plant, North West | Enertis Solar | Environmental Advisor |

Environmental Permitting & Water Use License (WUL) Applications

| Project Name & Location | Client Name | Role |
|--|--------------------|-----------------------|
| Permitting for the Kathu PV SEF, Northern Cape | Abengoa Solar | Project Manager & EAP |
| S53 application for Kabi Kimberley De Beers PV Plant, Northern Cape | Kabi Energy | Project Manager & EAP |
| S53 application for the Blackwood PV SEF, Free State | VentuSA Energy | Project Manager & EAP |
| S53 application for the Boundary PV SEF, Northern Cape | VentuSA Energy | Project Manager & EAP |
| S53 application for Vaalkop & Witkop PV SEF's, North West | Kabi Energy | Project Manager & EAP |
| S53 applications for various projects (Amandla Welang, Didar, Inkululeko, Kleinfontein, Klip Gat, Naau Poort, Toitdale & Tollie PV SEF's), Northern Cape | Terra Solar | Project Manager & EAP |
| WUL application for the Woodhouse PV1 & PV2 SEF's, North West | Genesis Eco-Energy | Project Manager & EAP |

RENEWABLE POWER GENERATION PROJECTS: CONCENTRATED SOLAR FACILITIES (CSP)**Environmental Impact Assessments and Environmental Management Programmes**

| Project Name & Location | Client Name | Role |
|---|--|-----------------------|
| De Aar CSP Energy facility, Northern Cape | African Clean Energy Developments (ACED) | Project Manager & EAP |
| Khi Solar One CSP facility, Northern Cape | Abengoa Solar | Project Manager & EAP |
| Noupoort CSP facility, Northern Cape | Cresco | Project Manager & EAP |
| Paulputs CSP facility, Northern Cape | Abengoa Solar | Project Manager & EAP |
| Pofadder & Upington CSP facilities, Northern Cape | Abengoa Solar | Project Manager & EAP |
| SolarReserve Kotulo Tsatsi CSP facility, Northern Cape province | SolarReserve | Project Manager & EAP |
| SolarReserve Kotulo Tsatsi CSP1 facility, Northern Cape | Kotulo Tsatsi Energy and SolarReserve South Africa | Project Manager & EAP |
| SolarReserve Kotulo Tsatsi CSP2 facility, Northern Cape | Kotulo Tsatsi Energy and SolarReserve South Africa | Project Manager & EAP |
| SolarReserve Kotulo Tsatsi CSP3 facility, Northern Cape | Kotulo Tsatsi Energy and SolarReserve South Africa | Project Manager & EAP |
| Upington 2 CSP facility, Northern Cape | Abengoa Solar | Project Manager & EAP |
| Upington 3 CSP facility, Northern Cape | Abengoa Solar | Project Manager & EAP |
| Xina Solar One CSP facility, Northern Cape | Abengoa Solar | Project Manager & EAP |

Environmental Compliance, Auditing and ECO

| Project Name & Location | Client Name | Role |
|--|--------------------|-----------------|
| KaXu Solar One facility, Northern Cape | Abengoa Solar | Project Manager |
| Khi Solar One facility, Northern Cape | Abengoa Solar | Project Manager |
| Xina Solar One facility, Northern Cape | Abengoa Solar | Project Manager |

Screening Studies

| Project Name & Location | Client Name | Role |
|---|--------------------|-----------------------|
| Site Identification Tool for Proposed CSP Projects, Limpopo | Exxaro | Environmental Advisor |

Compliance Advice and ESAP reporting

| Project Name & Location | Client Name | Role |
|---|---------------|-----------------------|
| Kaxu Solar One CSP facility, Northern Cape | Abengoa Solar | Environmental Advisor |
| Khi Solar One CSP facility, Northern Cape | Abengoa Solar | Environmental Advisor |
| SolarReserve Kotulo Tsatsi CSP facility, Northern Cape province | SolarReserve | Environmental Advisor |
| Xina One CSP facility, Northern Cape | Abengoa Solar | Environmental Advisor |

RENEWABLE POWER GENERATION PROJECTS: WIND ENERGY FACILITIES

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|---|--|-----------------------|
| ABs WEF near Indwe, Eastern Cape | Rainmaker Energy | Project Manager & EAP |
| Amakhala Emoyeni WEF, Eastern Cape | Windlab Developments | Project Manager & EAP |
| Amatole (2 phases) WEF, Eastern Cape | Genesis ECO-Energy | Project Manager & EAP |
| Boulders Wind Farm, Western Cape | IPD Power | Project Manager & EAP |
| Britannia Bay WEF, Western Cape | Terra Power Solutions | Project Manager & EAP |
| Castle WEF in De Aar, Northern Cape | Juwi Renewable Energies | Project Manager & EAP |
| Cookhouse WEF, Eastern Cape | African Clean Energy Developments (ACED) & Tertia Waters | Project Manager & EAP |
| Deep River Wind Energy Facility, Eastern Cape | VentuSA Energy | Project Manager & EAP |
| Dorper Phase 1 WEF, Eastern Cape | Rainmaker Energy | Project Manager & EAP |
| Elliot WEF, Eastern Cape | Rainmaker Energy | Project Manager & EAP |
| Garob WEF, Northern Cape | Juwi Renewable Energies | Project Manager & EAP |
| Gouda WEF, Western Cape | VentuSA Energy | Project Manager & EAP |
| Great Karoo WEF, Northern Cape | African Clean Energy Developments (ACED) | Project Manager & EAP |
| Gunstfontein WEF, Northern Cape | African Clean Energy Developments (ACED) | Project Manager & EAP |
| Happy Valley WEF, Eastern Cape | REISA | Project Manager & EAP |
| Hidden Valley WEF, Northern Cape | African Clean Energy Developments (ACED) | Project Manager & EAP |
| Hopefield WEF, Western Cape | Umoya Energy | Project Manager & EAP |
| Karoo Renewable Energy Facility, Northern & Western Cape | SARGE | Project Manager & EAP |
| Karreebosch Wind Farm (Roggeveld Phase 2), Northern Cape & Western Cape | G7 Renewable Energies | Project Manager & EAP |
| Karusa Wind Farm, Northern Cape | African Clean Energy Development | Project Manager & EAP |
| Klipheuwel / Dassiesfontein WEF, Western Cape | BioTherm Energy | Project Manager & EAP |
| Nojoli WEF, Eastern Cape | African Clean Energy Developments | Project Manager & EAP |
| Nxuba WEF, Eastern Cape | African Clean Energy Developments | Project Manager & EAP |
| Olifants River WEF, Western Cape | SARGE | Project Manager & EAP |

| Project Name & Location | Client Name | Role |
|---|----------------------------------|-----------------------|
| Oyster Bay WEF, Eastern Cape | RES | Environmental Advisor |
| Pofadder x3 WEF's, Northern Cape | Mainstream Renewable | Project Manager & EAP |
| Project Blue WEF, Northern Cape | Windy World | Project Manager & EAP |
| Rheboksfontein WEF, Western Cape | Moyeng Energy | Project Manager & EAP |
| Riverbank WEF near Wesley, Eastern Cape | Just Energy | Project Manager & EAP |
| Sere WEF, Western Cape | Eskom Generation | Project Manager & EAP |
| Soetwater Wind Farm, Northern Cape | African Clean Energy Development | Project Manager & EAP |
| Springfontein WEF, Northern Cape | Mainstream Renewable | Project Manager & EAP |
| Stormberg WEF, Eastern Cape | Networx / Prana Energy | Project Manager & EAP |
| Suurplaat WEF, Western & Northern Cape | Moyeng Energy | Project Manager & EAP |
| Uiekraal WEF, Western Cape | Crenergol | Project Manager & EAP |
| West Coast One WEF, Western Cape | Moyeng Energy | Project Manager & EAP |
| West Coast WEF, Western Cape | Exxaro | Project Manager & EAP |
| Zen WEF near Gouda, Western Cape | VentuSA Energy | Project Manager & EAP |

Basic Assessments

| Project Name & Location | Client Name | Role |
|--|-----------------------|-----------------------|
| Britannia Bay Wind Monitoring Mast, Western Cape | Terra Power Solutions | Project Manager & EAP |
| Caledon, Worcester & Tulbach Wind Monitoring Masts, Western Cape | SAGIT | Project Manager & EAP |
| Deep River Wind monitoring Mast, Eastern Cape | VentuSA Energy | Project Manager & EAP |
| Denhami Wind Farm, Western Cape | Richard Young | Project Manager & EAP |
| Dorper, Abs & Dobos Wind Monitoring Masts, Eastern Cape | Rainmaker Energy | Project Manager & EAP |
| Hopefield Wind Monitoring Mast, Western Cape | Umoya Energy | Project Manager & EAP |
| Klawer Wind Energy Facility, Western Cape | Vendiwell | Project Manager & EAP |
| Klipheuwel / Dassiesfontein Wind Monitoring Mast, Western Cape | BioTherm Energy | Project Manager & EAP |
| Riverbank Wind Monitoring Mast, Eastern Cape | Just Energy | Project Manager & EAP |
| Wind Monitoring Masts near Suurplaat, Western Cape | Investec Bank | Project Manager & EAP |
| Wind Monitoring Masts on the West Coast & Darling, Western Cape | Investec Bank | Project Manager & EAP |

Screening Studies

| Project Name & Location | Client Name | Role |
|--|--|-----------------------|
| Cookhouse WEF, Eastern Cape | African Clean Energy Developments (ACED) | Project Manager & EAP |
| De Aar WEF, Northern Cape | African Clean Energy Developments (ACED) | Project Manager & EAP |
| Developments within identified areas in the Overberg, Western Cape | BioTherm Energy | Project Manager & EAP |
| Hopefield WEF, Western Cape | African Clean Energy Developments (ACED) | Project Manager & EAP |
| Juno WEF, Western Cape | AMDA Developments | Project Manager & EAP |
| Lambert's Bat WEF, Western Cape | Vaayu Energy SA | Project Manager & EAP |
| Wind 500 – Eskom's investigation for new sites | Eskom Holdings | Project Manager & EAP |
| Struisbaai area WEF, Western Cape | Richard Young | Project Manager & EAP |
| Suurplaat WEF, Western Cape | Investec Bank | Project Manager & EAP |
| Theewaterskloof Municipality WEF, Western Cape | Theewaterskloof Municipality | Project Manager & EAP |

| Project Name & Location | Client Name | Role |
|--|---|-----------------------|
| WEF's on x2 site on the West Coast, Western Cape | Investec Bank | Project Manager & EAP |
| Various WEF's in the Western Cape | Department of Environmental Affairs & Development Planning (DEA&DP) | Project Manager & EAP |
| Van Reenens WEF, Kwa-Zulu Natal & Free State | 4GREEN Development Africa | Project Manager & EAP |
| WEF Development within the Sandveld area, Western Cape | Kovacs Investments (Nick Prium) | Project Manager & EAP |

Environmental Compliance, Auditing and ECO

| Project Name & Location | Client Name | Role |
|--|---------------------|-----------------|
| ECO for the Construction of the Dorper Phase 1 WEF, Eastern Cape | Rainmaker Energy | Project Manager |
| ECO for the Construction of the Gouda Wind Farm, Western Cape | Blue Falcon Trading | Project Manager |
| EO for the Construction of the Dassiesklip WEF, Western Cape | Group Five | Project Manager |

Compliance Advice & ESAP Reporting

| Project Name & Location | Client Name | Role |
|--------------------------------------|--|-----------------------|
| Amakhala Emoyeni WEF, Eastern Cape | Windlab Developments | Environmental Advisor |
| Cookhouse II WEF, Eastern Cape | African Clean Energy Developments | Environmental Advisor |
| Cookhouse WEF, Eastern Cape | African Clean Energy Developments | Environmental Advisor |
| Dorper Phase 1 WEF, Eastern Cape | Rainmaker Energy | Environmental Advisor |
| Garob WEF, Northern Cape | Juwi Renewable Energies | Environmental Advisor |
| Gouda WEF, Western Cape | Aveng / Acciona | Environmental Advisor |
| Happy Valley WEF, Eastern Cape | VentuSA Energy / EDPR | Environmental Advisor |
| Hidden Valley WEF, Northern Cape | African Clean Energy Developments (ACED) | Environmental Advisor |
| Hopefield WEF, Western Cape | Umoya Energy | Environmental Advisor |
| Karusa Wind Farm, Northern Cape | African Clean Energy Development | Environmental Advisor |
| Loperberg WEF, Eastern Cape | Rainmaker Energy | Environmental Advisor |
| Nobelsfontein WEF, Northern Cape | Coria / SARGE | Environmental Advisor |
| Nojoli WEF , Eastern Cape | African Clean Energy Developments (ACED) | Environmental Advisor |
| Nxuba WEF , Eastern Cape | African Clean Energy Developments | Environmental Advisor |
| Oyster Bay WEF, Eastern Cape | RES | Environmental Advisor |
| Riverbank Wind WEF, Eastern Cape | InnoWind | Environmental Advisor |
| Roggeveld Phase 1 WEF, Northern Cape | Building Energy | Environmental Advisor |
| Soetwater Wind Farm, Northern Cape | African Clean Energy Development | Environmental Advisor |
| Springfontein WEF, Northern Cape | Mainstream Renewable | Environmental Advisor |
| Zen WEF, Western Cape | VentuSA Energy | Environmental Advisor |

Due Diligence Reporting

| Project Name & Location | Client Name | Role |
|------------------------------------|---------------------|-----------------------|
| Gouda WEF, Western Cape | Blue Falcon Trading | Environmental Advisor |

| Project Name & Location | Client Name | Role |
|--|-----------------|-----------------------|
| Loeriesfontein, Khobab & Noupoort WEF's, Northern Cape | Actis | Environmental Advisor |
| Roggeveld Wind Farm, Northern Cape | Building Energy | Environmental Advisor |

Environmental Permitting & WUL Applications

| Project Name & Location | Client Name | Role |
|--|--|-----------------------|
| Permitting for the Cookhouse WEF, Eastern Cape | African Clean Energy Developments (ACED) | Project Manager & EAP |
| Permitting for the Karusa Wind Farm, Northern Cape | African Clean Energy Development | Project Manager & EAP |
| Permitting for the Sere WEF, Western Cape | Eskom | Project Manager & EAP |
| Permitting for the Soetwater Wind Farm, Northern Cape | African Clean Energy Development | Project Manager & EAP |
| Permitting Riverbank WEF, Eastern Cape | Electrawinds | Project Manager & EAP |
| S24G for the Klipheuwel / Dassiesfontein WEF, Western Cape | | Project Manager & EAP |
| S53 application for the Nxuba Wind Farm, Eastern Cape | African Clean Energy Developments (ACED) | Project Manager & EAP |
| S53 Application for the Zen WEF, Western Cape | VentuSA Energy | Project Manager & EAP |
| WUL application for the Oyster Bay WEF, Eastern Cape | RES | Project Manager & EAP |

CONVENTIONAL POWER GENERATION PROJECTS (COAL)

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|-------------------------------------|-------------|-----------------------|
| H2 Energy Power Station, Mpumalanga | H2 Energy | Project Manager & EAP |

Screening Studies

| Project Name & Location | Client Name | Role |
|---|-------------|-----------------------|
| Coal fired power station in the Bethal area, Mpumalanga | ISS Global | Project Manager & EAP |
| Indwe Power Station, Eastern Cape | IPSA | Project Manager & EAP |
| IPP Base Load Power Station Development in Lephalale, Limpopo | Exxaro | Project Manager & EAP |

Environmental Compliance, Auditing and ECO

| Project Name & Location | Client Name | Role |
|---|----------------|-----------------|
| ISO 14001:2015 Audit for the Hendrina Power Station, Mpumalanga | Eskom Holdings | Project Manager |

GAS to POWER GENERATION PROJECTS

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|--|------------------|-----------------------|
| Ankerlig OCGT to CCGT Conversion project & the Transmission Power Line between Ankerlig and the Omega Substation, Western Cape | Eskom Generation | Project Manager & EAP |
| Gourikwa OCGT to CCGT Conversion project & the Transmission Power Line between Gourikwa and the | Eskom Generation | Project Manager & EAP |

| | | |
|--|--------|-----------------------|
| Proteus Substation, Western Cape | | |
| Neopak Combined Heat and Power (CHP) Plant, Rosslyn, Gauteng | Neopak | Project Manager & EAP |
| Richards Bay Combined Cycle Gas Turbine (CCGT) Power Plant, Kwa-Zulu Natal | Eskom | Project Manager & EAP |

Screening Studies

| Project Name & Location | Client Name | Role |
|--|--------------|-----------------|
| Environmental Analysis for Gas Transmission Pipelines in the Clayville, Nigel and Wadeville areas, Gauteng | Energy Group | Project Manager |

INFRASTRUCTURE DEVELOPMENT PROJECTS (BRIDGES, PIPELINES, ROADS, WATER RESOURCES, STORAGE, ETC)

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|--|--|-----------------------|
| Afguns Road Realignment Project, Limpopo | Eskom Holdings | Project Manager & EAP |
| Expansion of the existing Welgedacht Water Care Works, Gauteng | ERWAT | Project Manager & EAP |
| Industrial Metals Cluster, Northern Cape | Northern Cape Department of Economic Development and Tourism | Project Manager & EAP |
| Modification of the existing Hartebeestfontein Water Care Works, Gauteng | ERWAT | Project Manager & EAP |

Basic Assessments

| Project Name & Location | Client Name | Role |
|---|--|-----------------------|
| New Raw Water Reservoir & Pipeline for the Medupi Power Station, Limpopo | Eskom Holdings | Project Manager & EAP |
| Msenge Emoyeni WEF Watercourse Crossings, Eastern Cape | Windlab | Project Manager & EAP |
| Dilokong Transport Facility, Limpopo | South African National Roads Agency Limited (SANRAL) | Project Manager & EAP |
| Neopak Water Treatment Plant, Gauteng | Neopak | Project Manager & EAP |
| Realignment of MR73 Road for the Construction of the Paulputs CSP Facility, Northern Cape | Abengoa Solar | Project Manager & EAP |
| Biomass Storage Area in Support of the Mkuze Biomass Power Station, KwaZulu-Natal | Building Energy | Project Manager & EAP |
| Wastewater Dam & Pipeline in Support of the Mkuze Biomass Power Station, Kwa-Zulu Natal | Building Energy | Project Manager & EAP |
| Watercourse Crossings for the Klawer Wind Energy Facility, Western Cape | Vendiwell | Project Manager & EAP |

Environmental Compliance, Auditing and ECO

| Project Name & Location | Client Name | Role |
|--|---------------------------------|-----------------|
| ECO for the Construction of the Tiffindell Ski Resort, Eastern Cape | Tiffindell Ski | ECO |
| ECO for the Distribution centre & warehouse at Lords View Industrial Estate, Gauteng | Oliver & Partners | Project Manager |
| ECO for the Upgrade of the Waterval Wastewater Treatment Works, Gauteng | BCP Palace (on behalf of ERWAT) | Project Manager |

Compliance Advice and reporting

| Project Name & Location | Client Name | Role |
|-------------------------------------|--------------------|-----------------------|
| Mkuze Biomass Plant, Kwa-Zulu Natal | Building Energy | Environmental Advisor |
| Tiffindell Ski, Eastern Cape | Tiffindell Ski | Environmental Advisor |

Environmental Permitting & WUL Applications

| Project Name & Location | Client Name | Role |
|--|--------------------|-----------------------|
| Permitting, S53 & WULA for the Mkuze Biomass Plant, Kwa-Zulu Natal | Building Energy | Project Manager & EAP |
| WULA for the Visserhok Waste Tyre Depot, Western Cape | REDISA | Project Manager & EAP |
| WULA for the Witbank Waste Tyre Depot, Mpumalanga | REDISA | Project Manager & EAP |

MINING

Environmental Compliance, Auditing and ECO

| Project Name & Location | Client Name | Role |
|--|--------------------|-----------------|
| Compliance Audit for the Palesa Coal Mine WML, Mpumalanga province | HCI Coal | Project Manager |
| Compliance Audit Waste Use Licene for the Mbali Coal Mine, Mpumalanga province | HCI Coal | Project Manager |

ENVIRONMENTAL MANAGEMENT TOOLS

| Project Name & Location | Client Name | Role |
|--|---|-----------------------|
| Review the effectiveness & efficiency of the environmental impact management (EIA) system in South Africa, and formulate an environmental impact management strategy and action plan | National Department of Environmental Affairs | Environmental Advisor |
| Drafting a Position Paper: Project Financing and Environmental Risk Management (considering IFC Performance Standards & Equator Principles) | Standard Bank Group | Environmental Advisor |
| EMP for the Phase 1 of the Elitheni Coal Mine Project, Eastern Cape | Elitheni Coal | Environmental Advisor |
| Gap Analysis of Environmental Management Systems (EMS) with ISO 14001:2004 | Venture Diversified Products | Environmental Advisor |
| Development of Provincial Guidelines for 4x4 routes | Western Cape Department of Environmental Affairs & Development Planning | Environmental Advisor |
| Permitting Study on the Status of Renewable Energy Projects in South Africa | E.ON | Environmental Advisor |
| Practical review of EGI SEA | CSIR | Environmental Advisor |
| Development & Implementation of the Environmental Management Systems (EMS) with ISO 14001:2004 for the UBS Office in Sandton, Gauteng | UBS AG | Environmental Advisor |

| | | |
|---|-------------------|-----------------------|
| Resource & Efficiency Plans for the operation phase of the Mulilo Solar PV De Aar and Mililo Solar PV Prieska | Mulilo and X-Elio | Environmental Advisor |
|---|-------------------|-----------------------|

TRAINING

| Project Name & Location | Client Name | Role |
|---|--------------------|-----------------|
| Hendrina Power Station Environmental Law Training | Eskom Holding | Project Manager |
| Radar Training for NCC Biologists | EchoTracks | Project Manager |



CURRICULUM VITAE OF NICOLENE VENTER

| | |
|-------------------------|--|
| Profession : | Public Participation and Social Consultant |
| Specialisation: | Public participation process; stakeholder engagement; facilitation (workshops, focus group and public meetings; public open days; steering committees); monitoring and evaluation of public participation and stakeholder engagement processes |
| Work Experience: | 23 years' experience as a Public Participation Practitioner and Stakeholder Consultant |

VOCATIONAL EXPERIENCE

Over the past 23 years Nicolene established herself as an experienced and well recognised public participation practitioner, facilitator and strategic reviewer of public participation processes. She has experience in managing public participation and stakeholder engagement projects and awareness creation programmes. Her experience includes designing and managing countrywide public participation and stakeholder engagement projects and awareness creation projects, managing multi-project schedules, budgets and achieving project goals. She has successfully undertaken several public participation processes for EIA, BA and WULA projects. The EIA and BA process include linear projects such as the NMPP, Eskom Transmission and Distribution power lines as well as site specific developments such as renewable energy projects i.e. solar, photo voltaic and wind farms. She also successfully managed stakeholder engagement projects which were required to be in line with the Equator Principles, locally and in neighbouring countries.

SKILLS BASE AND CORE COMPETENCIES

- Project Management
- Public Participation, Stakeholder Engagement and Awareness Creation
- Public Speaking and Presentation Skills
- Facilitation (workshops, focus group meetings, public meetings, public open days, working groups and committees)
- Social Assessments (Stakeholder Analysis / Stakeholder Mapping)
- Monitoring and Evaluation of Public Participation and Stakeholder Engagement Processes
- Community Liaison
- IFC Performance Standards
- Equator Principles
- Minute taking, issues mapping, report writing and quality control

EDUCATION AND PROFESSIONAL STATUS

Degrees / Diplomas / Certificates:

- Higher Secretarial Certificate, Pretoria Technicon (1970)

Short Courses:

- Techniques for Effective Public Participation, International Association for Public Participation, IAP2 (2008)
- Foundations of Public Participation (Planning and Communication for Effective Public Participation), IAP2 (2009)
- Certificate in Public Participation – IAP2SA Modules 1, 2 and 3 (2013)

Certificate in Public Relations, Public Relation Institute of South Africa, Damelin Management School (1989)

Professional Society Affiliations:

- Member of International Association for Public Participation (IAP2): Southern Africa

EMPLOYMENT

| Date | Company | Roles and Responsibilities |
|-------------------------|----------------------------------|---|
| November 2018 – current | Savannah Environmental (Pty) Ltd | <p>Public Participation and Social Consultant</p> <p><i>Tasks include:</i></p> <p><i>Tasks include: Drafting of a Public Participation Plan with key deliverable dates and methodology to be followed, Background Information Document, Letters to Stakeholders and Interested and/or Affected Parties (I&APs) inclusive of key project deliverables and responses to questions / concerns raised; Stakeholder identification; facilitating stakeholder workshops, focus group and public meetings; conduct one-on-one consultation with Community Leaders, Tribal Chiefs, affected landowners, etc.</i></p> <p><i>Managing interaction between Stakeholders and Team Members, liaising with National, Provincial and Local Authorities, managing community consultation and communications in project affected areas, attend to the level of technical information communicated to and consultation with all level of stakeholders involved.</i></p> |

| Date | Company | Roles and Responsibilities |
|---------------------|--|---|
| 2016 – October 2018 | Imaginative Africa (Pty) Ltd <i>(Director of Imaginative Africa)</i> | Independent Consultant Consulting to various Environmental Assessment Practitioners for Public Participation and Stakeholder Engagements: <u>Tasks include:</u> Tasks include: Drafting of a Public Participation Plan with key deliverable dates and methodology to be followed, Background Information Document, Letters to Stakeholders and Interested and/or Affected Parties (I&APs) inclusive of key project deliverables and responses to questions / concerns raised; Stakeholder identification; facilitating stakeholder workshops, focus group and public meetings; conduct one-on-one consultation with Community Leaders, Tribal Chiefs, affected landowners, etc. Managing interaction between Stakeholders and Team Members, liaising with National, Provincial and Local Authorities, managing community consultation and communications in project affected areas, attend to the level of technical information communicated to and consultation with all level of stakeholders involved <u>Clients:</u> SiVEST Environmental Savannah Environmental Baagi Environmental Royal Haskoning DHV (previously SSI) |
| 2013 - 2016 | Zitholele Consulting Contact person: Dr Mathys Vosloo Contact number: 011 207 2060 | Senior Public Participation Practitioner and Project Manager <u>Tasks included:</u> Project managed public participation process for EIA/BA/WULA/EAL projects. Manages two Public Participation Administrators. Public Participation tasks as outlined as above and including financial management of public participation processes. |
| 2011 - 2013 | Imaginative Africa (Pty) Ltd <i>(company owned by Nicolene Venter)</i> | Independent Consultant Consulting to various Environmental Assessment Practitioners for Public Participation and Stakeholder Engagements <u>Tasks included:</u> Drafting of a Public Participation Plan with key deliverable dates and methodology to be followed, Background Information Document, |

| | | |
|--------------------|--|--|
| | | <p>Letters to Stakeholders and Interested and/or Affected Parties (I&APs) inclusive of key project deliverables and responses to questions / concerns raised; Stakeholder identification; facilitating stakeholder workshops, focus group and public meetings; conduct one-on-one consultation with Community Leaders, Tribal Chiefs, affected landowners, etc.</p> <p>Managing interaction between Stakeholders and Team Members, liaising with National, Provincial and Local Authorities, managing community consultation and communications in project affected areas, attend to the level of technical information communicated to and consultation with all level of stakeholders involved</p> <p><u>Clients:</u> Bohlweki Environmental Bembani Sustainability (Pty) Ltd Naledzi Environmental</p> |
| 2007 – 2011 | SiVEST SA (Pty) Ltd Contact person: Andrea Gibb Contact number: 011 798 0600 | Unit Manager: Public Participation Practitioner <u>Tasks included:</u> Project managed public participation process for EIA/BA projects. Manages two Junior Public Participation Practitioners. Public Participation tasks as outlined as above and including financial management of public participation processes. |
| 2005 – 2006 | Imaginative Africa (Pty) Ltd (company owned by Nicolene Venter) | Independent Consultant Public Participation and Stakeholder Engagement Practitioner <u>Tasks included:</u> Drafting of a Public Participation Plan with key deliverable dates and methodology to be followed, Background Information Document, Letters to Stakeholders and Interested and/or Affected Parties (I&APs) inclusive of key project deliverables and responses to questions / concerns raised; Stakeholder identification; facilitating stakeholder workshops, focus group and public meetings; conduct one-on-one consultation with Community Leaders, Tribal Chiefs, affected landowners, etc. Managing interaction between Stakeholders and Team Members, liaising with National, Provincial and Local Authorities, managing community consultation and communications in project affected areas, attend to the level of technical |

| | | |
|--------------------|---|--|
| | | <p>information communicated to and consultation with all level of stakeholders involved.</p> <p><u>Clients:</u></p> <p>Manyaka-Greyling-Meiring (previously Greyling Liaison and currently Golder Associates)</p> |
| 1997 - 2004 | <p>Imaginative Africa (Pty) Ltd</p> <p>(company owned by Nicolene Venter)</p> | <p>Independent Consultant: Public Participation Practitioner.</p> <p><u>Tasks included:</u></p> <p>Drafting of a Public Participation Plan with key deliverable dates and methodology to be followed, Background Information Document, Letters to Stakeholders and Interested and/or Affected Parties (I&APs) inclusive of key project deliverables and responses to questions / concerns raised; Stakeholder identification; facilitating stakeholder workshops, focus group and public meetings; conduct one-on-one consultation with Community Leaders, affected landowners, etc.</p> <p>Managing interaction between Stakeholders and Team Members, liaising with National, Provincial Local Authorities, managing community consultation and communications in project affected areas, attend to the level of technical information communicated to and consultation with all level of stakeholders involved.</p> <p><u>Clients:</u></p> <p>Greyling Liaison (currently Golder Associates); Bemani Sustainability (Pty) Ltd; Lidwala Environmental; Naledzi Environmental</p> |

PROJECT EXPERIENCE

RENEWABLE POWER GENERATION PROJECTS

PHOTOVOLTAIC SOLAR ENERGY FACILITIES

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|--|--|--|
| Lichtenburg PVs (3 PVs) & Power Lines (grid connection), Lichtenburg, North West Province | Atlantic Energy Partners EAP: Savannah Environmental | Project Manage the Public Participation Process Facilitate all meetings Consultation with Government Officials, Key Stakeholders, Landowners & Community Leaders |
| Allepad PVs 4 PVs) & Power Lines (grid connection), Upington, Northern Cape Province | IL Energy EAP: Savannah Environmental | |
| Hyperion Solar PV Developments (4 PVs) and Associated Infrastructures, Kathu, Northern Cape Province | Building Energy EAP: Savannah Environmental | |
| Aggeneys Solar PV Developments (2 PVs) and Associated Infrastructures, Aggeneys, Northern Cape Province | Atlantic Energy Partners and ABO Wind EAP: Savannah Environmental | |
| Upilanga Solar Park, Northern Cape (350MW CSP Tower) | Emvelo Capital Projects (Pty) Ltd | |
| Khunab Solar Development, consisting of Klip Punt PV1, McTaggarts PV1, McTaggarts PV2, McTaggarts PV3 and the Khunab solar Grid Connection near Upington, Northern Cape Province | Atlantic Energy Partners and Abengoa | |
| Sirius Solar PV3 and PV4, near Upington, Northern Cape Province | Solal | |
| Geelster PV 1 and PV2 solar energy facilities, near Aggeneys, Northern Cape | ABO Wind | |
| Naledi PV and Ngwedi PV solar energy facilities, near Upington, Northern Cape | Atlantic Energy Partners and Abengoa | |
| Kotulo Tsatsi PV1, Kotulo Tsatsi PV3 and Kotulo Tsatsi PV4 solar energy facilities, near Kenhardt, Northern Cape | Kotulo Tsatsi Energy | |
| Thlitseng PV, including Substations & Power Lines, Lichtenburg, North West Province | BioTherm Energy EAP: SiVEST | Public Participation, Landowner and Community Consultation |
| Sendawo PVs, including Substations & Power Lines, Vryburg, North West Province | | |
| Helena Solar 1, 2 and 3 PVs, Copperton, Northern Cape Province | | |
| Farm Spes Bona 23552 Solar PV Plants, Bloemfontein, Free State Province | Surya Power EAP: SiVEST | Public Participation, Landowner and Community Consultation |
| De Aar Solar Energy Facility, De Aar, Northern Cape Province | South Africa Mainstream Renewable Power Developments EAP: SiVEST | Public Participation, Landowner and Community Consultation |
| Droogfontein Solar Energy Facility, Kimberley, Northern Cape Province | | |
| Kaalspruit Solar Energy Facility, Loeriesfontein, Northern Cape Province | | |

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|--|---|--|
| Platsjambok East PV, Prieska, Northern Cape Province | | |
| Renosterburg PV, De Aar, Northern Cape Province | Renosterberg Wind Energy Company EAP: SIVEST | Public Participation, Landowner and Community Consultation |
| 19MW Solar Power Plant on Farm 198 (Slypklip), Danielskuil, Northern Cape Province | Solar Reserve South Africa EAP: SIVEST | Public Participation, Landowner and Community Consultation |

Basic Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|---|--------------------------------------|---|
| Upilanga Solar Park, Northern Cape (x6 100MW PV's and x3 350MW PV Basic Assessments) | Emvelo Capital Projects (Pty) Ltd | Project Manage the Public Participation Process Facilitate all meetings Consultation with Government Officials, Key Stakeholders, Landowners & Community Leaders |
| Sirius Solar PV Solar Energy Facility, Upington, Northern Cape Province | SOLA Future Energy | |
| Khunab Solar Development, consisting of Klip Punt PV1, McTaggart PV1, McTaggart PV2, McTaggart PV3 and the Khunab solar Grid Connection near Upington, Northern Cape Province | Atlantic Energy Partners and Abengoa | |

WIND ENERGY FACILITIES

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|---|---|----------------------|
| Aletta Wind Farm, Copperton, Northern Cape Province | BioTherm Energy EAP: SIVEST | Public Participation |
| Eureka Wind Farm, Copperton, Northern Cape Province | | |
| Loeriesfontein Wind Farm, Loeriesfontein, Northern Cape Province | South Africa Mainstream Renewable Power Developments EAP: SIVEST | Public Participation |
| Droogfontein Wind Farm, Loeriesfontein, Northern Cape Province | | |
| Four Leeuwberg Wind Farms, Loeriesfontein, Northern Cape Province | | |
| Noupoort Wind Farm, Noupoort, Northern Cape Province | | |
| Mierdam PV & Wind Farm, Prieska, Northern Cape Province | | |
| Platsjambok West Wind Farm & PV, Prieska, Northern Cape Province | | |

Basic Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|---|-------------|------|
| Cluster of Renewable Energy Developments, Eastern Cape Province | Wind Relic | |

| | | |
|---|--|--|
| Nama Wind Energy Facility, Northern Cape Province | Genesis ECO EAP: Savannah Environmental | Project Manage the Public Participation Process Facilitate all meetings Consultation with Government Officials, Key Stakeholders, Landowners & Community Leaders |
| Zonnequa Wind Energy Facility, Northern Cape Province | | |

CONCENTRATED SOLAR FACILITIES (CSP)

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|---|---|--|
| Upington Concentrating Solar Plant and associated Infrastructures, Northern Cape Province | Eskom Holdings EAP: Bohlweki Environmental | Project Manage the Public Participation Process Facilitate all meetings Consultation with Government Officials, Key Stakeholders, Landowners & Community Leaders |

CONVENTIONAL POWER GENERATION PROJECTS (GAS)

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|---|----------------------------|---|
| 450MW gas to power project and associated 132kV power line, Richards bay, KwaZulu-Natal | Phinda Power Producers | Project Manage the Public Participation Process Facilitate all meetings Consultation with Government Officials, Key Stakeholders & Landowners |
| 4000MW gas to power project and associated 400kV power lines, Richards bay, KwaZulu-Natal | Phinda Power Producers | |
| Richards Bay Gas to Power Combined Cycle Power Station, KwaZulu-Natal | Eskom Holdings SoC Limited | |

GRID INFRASTRUCTURE PROJECTS

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|--|--|--|
| 132/11kV Olifantshoek Substation and Power Line, Northern Cape | Eskom | Project Manage the Public Participation Process Facilitate all meetings Consultation with Government Officials, Key Stakeholders, Landowners & Community Leaders |
| Grid connection infrastructure for the Namas Wind Farm, Northern Cape Province | Genesis Namas Wind (Pty) Ltd | |
| Grid connection infrastructure for the Zonnequa Wind Farm, Northern Cape Province | Genesis Zonnequa Wind (Pty) Ltd | |
| Khunab Solar Grid Connection, near Upington, Northern Cape Province | Atlantic Energy Partners and Abengoa | |
| Pluto-Mahikeng Main Transmission Substation and 400kV Power Line (Carletonville to Mahikeng), Gauteng and North West Provinces | Eskom Holdings EAP: Baagi Environmental | |
| Thyspunt Transmission Lines Integration Project, Eastern Cape Province | Eskom Holdings EAP: SIVEST | |
| Westrand Strengthening Project, Gauteng Province | | Public Participation, |

| | | |
|---|--|--|
| Mookodi Integration Project, North-West Province | | |
| Transnet Coallink, Mpumalanga and KwaZulu-Natal Provinces | | |
| Delarey-Kopela-Phahameng Distribution power line and newly proposed Substations, North-West Province | | Public Participation, Landowner and Community Consultation |
| Invubu-Theta 400kV Eskom Transmission Power Line, KwaZulu-Natal Province | Eskom Holding EAP: Bemani Environmental | |
| Melkhout-Kudu-Grassridge 132kV Power Line Project (project not submitted to DEA), Eastern Cape Province | Eskom Holdings EAP: SIVEST | Public Participation, Landowner and Community Consultation |
| Tweespruit-Welroux-Driedorp-Wepener 132Kv Power Line, Free State Province | | |
| Kuruman 132Kv Power Line Upgrade, Northern Cape Province | Eskom Holdings EAP: Zitholele | |
| Vaalbank 132Kv Power Line, Free State Province | | |
| Pongola-Candover-Golela 132kV Power Line (Impact Phase), KwaZulu-Natal Province | | |

PART 2 AMENDMENTS

| Project Name & Location | Client Name | Role |
|---|--------------------------------------|---|
| Transalloys Coal-Fired Power Station near Emalahleni, Mpumalanga Province | Transalloys (Pty) Ltd | Project Manage the Public Participation Process |
| Zen Wind Energy Facility, Western Cape | Energy Team (Pty) Ltd | |
| Hartebeest Wind Energy Facility, Western Cape | juwi Renewable Energies (Pty) Ltd | |
| Khai-Ma and Korana Wind Energy Facilities | Mainstream Renewable Power (Pty) Ltd | |

FACILITATION

| Project Name & Location | Client Name | Meeting Type |
|--|---|--|
| Bloemfontein Strengthening Project, Free State Province | Eskom Holdings EAP: Baagi Environmental | Public Meetings |
| Moodraai-Smitkloof 132kV Power Line and Substation, Northern Cape Province | Eskom Holdings EAP: SSI | Focus Group Meetings |
| Aggeneis-Oranjemond 400kV Eskom Transmission Power Line, Northern Cape Province | Eskom Holdings EAP: Savannah Environmental | Focus Group Meetings & Public Meetings |
| Ariadne-Eros 400kV/132kV Multi-Circuit Transmission Power Line (Public Meetings) | Eskom Holdings EAP: ACER Africa | Public Meetings |
| Majuba-Venus 765kV Transmission Power Lines, Mpumalanga Province | | |
| Thabametsi IPP Power Station, Limpopo Province | Thabametsi Power Company EAP: Savannah Environmental | Focus Group Meeting & Public Meeting |
| Aggeneis-Oranjemond Transmission Line & Substation Upgrade, Northern Cape | Eskom Transmission | Focus Group Meetings & Public Meetings |

SCREENING STUDIES

| Project Name & Location | Client Name | Role |
|--|--|-------------------|
| Potential Power Line Alternatives from Humansdorp to Port Elizabeth, Eastern Cape Province | Nelson Mandela Bay Municipality EAP: SiVEST | Social Assessment |

ASH DISPOSAL FACILITIES

Environmental Impact Assessments and Environmental Management Programmes

| Project Name & Location | Client Name | Role |
|--|--|---|
| Medupi Flue Gas Desulphurisation Project (up to completion of Scoping Phase), Limpopo Province | Eskom Holdings SOC Ltd EAP: Zitholele Consulting | Public Participation, Landowner and Community Consultation |
| Kendal 30-year Ash Disposal Facility, Mpumalanga Province | | |
| Kusile 60-year Ash Disposal Facility, Mpumalanga Province | | |
| Camden Power Station Ash Disposal Facility, Mpumalanga Province | | |
| Tutuka Fabric Filter Retrofit and Dust Handling Plant Projects, Mpumalanga Province | Eskom Holdings SOC Ltd EAP: Lidwala Environmental | |
| Eskom's Majuba and Tutuka Ash Dump Expansion, Mpumalanga Province | | |
| Hendrina Ash Dam Expansion, Mpumalanga Province | | |

INFRASTRUCTURE DEVELOPMENT PROJECTS (BRIDGES, PIPELINES, ROADS, WATER RESOURCES, STORAGE, ETC)

Basic Assessments

| Project Name & Location | Client Name | Role |
|--|--|---|
| Expansion of LOX and Diesel Storage at the Air Products Facility in Coega, Eastern Cape | Air Products South Africa (Pty) Ltd | Project Manage the Public Participation Process Facilitate all meetings Consultation with Government Officials, Key Stakeholders & Landowners |
| Transnet's New Multi-Products Pipeline traversing Kwa-Zulu Natal, Free State and Gauteng Provinces | Transnet EAP: Bohlweki Environmental | |
| Realignment of the Bulshoek Dam Weir near Klaver and the Doring River Weir near Clanwilliam, Western Cape Province | Dept of Water and Sanitation EAP: Zitholele | Public Participation |

STAKEHOLDER ENGAGEMENT

| Project Name & Location | Client Name | Role |
|--|--------------------|--|
| Socio-Economic Impact Study for the shutdown and repurposing of Eskom Power Stations: Komati Power Station, Hendrina Power Station & Grootvlei Power Station | Urban-Econ | Project Management for the stakeholder engagement with Community |

| | | |
|---|--|--|
| | | Representatives in the primary data capture area |
| First State of Waste Report for South Africa | Golder Associates on behalf of the Department of Environmental Affairs | Secretarial Services |
| Determination, Review and Implementation of the Reserve in the Olifants/Letaba System | Golder Associates on behalf of the Department of Water and Sanitation | |
| Orange River Bulk Water Supply System | | |
| Levuvu-Letaba Resources Quality Objectives | | |

FACILITATION

| Project Name & Location | Client Name | Meeting Type |
|--|--|----------------------|
| Determination, Review and Implementation of the Reserve in the Olifants/Letaba System | Department of Water and Sanitation | Secretarial Services |
| Orange River Bulk Water Supply System | Golder Associates | Secretarial Services |
| Levuvu-Letaba Resources Quality Objectives | | Secretarial Services |
| SmancorCR Chemical Plant (Public Meeting), Gauteng Province | Samancor Chrome (Pty) Ltd EAP: Environmental Science Associates | Public Meeting |
| SANRAL N4 Toll Highway Project (2 nd Phase), Gauteng & North West Provinces | Department of Transport EAP: Bohlweki Environmental | Public Meetings |

MINING SECTOR

Environmental Impact Assessment and Environmental Management Programme

| Project Name & Location | Client Name | Role |
|--|---|---|
| Zero Waste Recovery Plant at highveld Steel, Mpumalanga Province | Anglo African Metals EAP: Savannah Environmental | Public Participation |
| Koffiefontein Slimes Dam, Free State Province | Petra Diamond Mines EAP: Zitholele | Public Participation |
| Baobab Project: Ethenol Plant, Chimbanje, Middle Sabie, Zimbabwe | Applicant: Green Fuel EAP: SIVEST | Public Participation & Community Consultation |
| BHP Billiton Energy Coal SA's Middelburg Water Treatment Plant, Mpumalanga | BHP Billiton Group EAP: Jones & Wagener | Public Participation |

ENVIRONMENTAL AUTHORISATION AMENDMENTS

| Project Name & Location | Client Name | Role |
|--|---|----------------------|
| Transalloys Coal-Fired Power Station near Emalahleni, Mpumalanga Province | Transalloys (Pty) Ltd | Public Participation |
| Zen Wind Energy Facility, Western Cape | Energy Team (Pty) Ltd | |
| Hartebeest Wind Energy Facility, Western Cape | juwi Renewable Energies (Pty) Ltd | |
| Khai-Ma and Korana Wind Energy Facilities | Mainstream Renewable Power (Pty) Ltd | |
| Beaufort West 280MW Wind Farm into two 140MW Trakas and Beaufort West Wind Farms, Western Cape | South Africa Mainstream Renewable Power Developments EAP: SIVEST | |

SECTION 54 AUDITS

| Project Name & Location | Client Name | Role |
|--|--------------------------------|--|
| Mulilo 20MW PV Facility, Prieska, Northern Cape | Mulilo (Pty) Ltd | Public Participation: I&AP Notification process |
| Mulilo 10MW PV Facility, De Aar, Northern Cape | Mulilo (Pty) Ltd | |
| Karoshhoek CSP 1 Facility/ Solar One, Upington, Northern Cape | Karoshhoek Solar One (Pty) Ltd | |

Appendix 4 – DFFE Screening Tool Report

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

EIA Reference number: TBD

Project name: Joel

Project title: Joel Development Area

Date screening report generated: 06/06/2022 10:49:34

Applicant: Freegold Harmony (Pty) Ltd

Compiler: Savannah Environmental

Compiler signature:



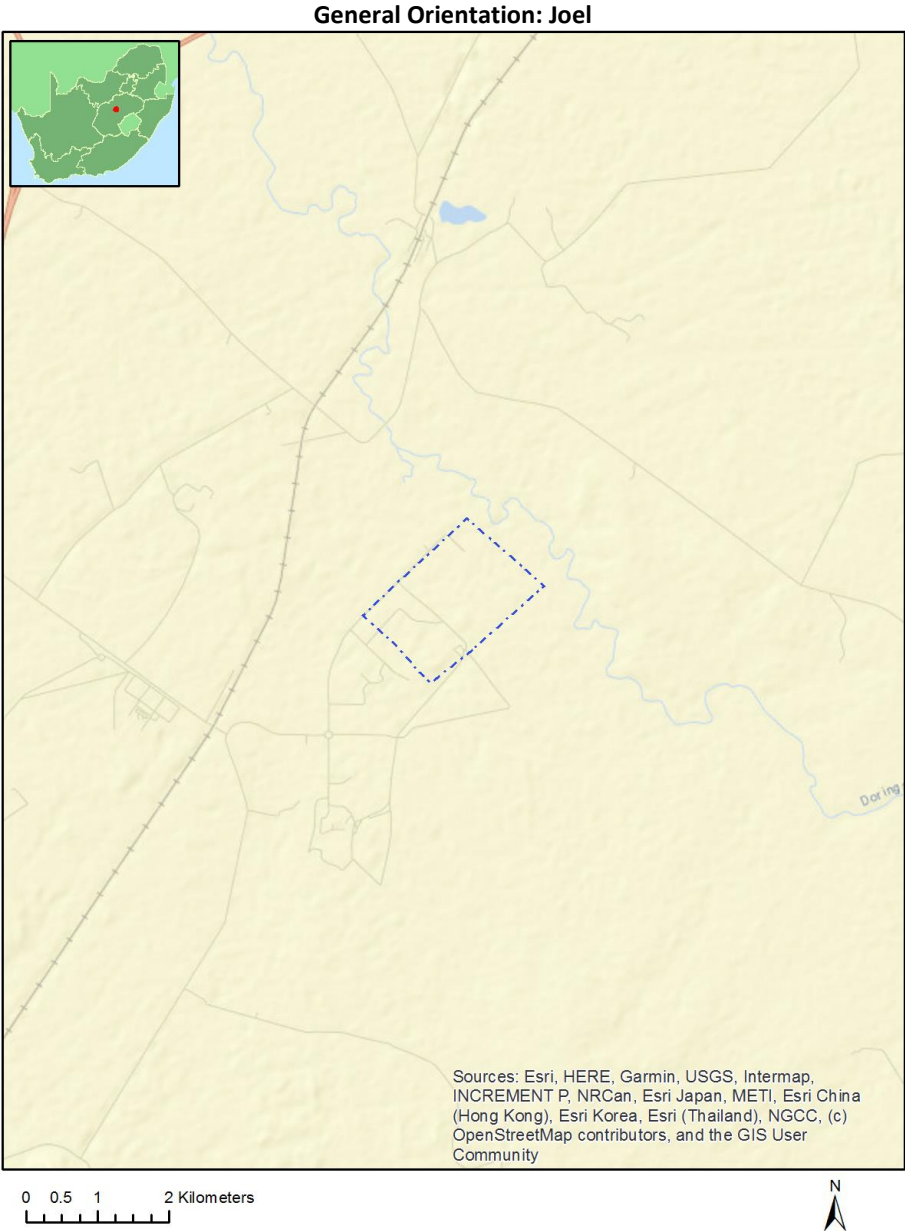
Application Category: Utilities Infrastructure | Electricity | Generation | Renewable | Solar | PV

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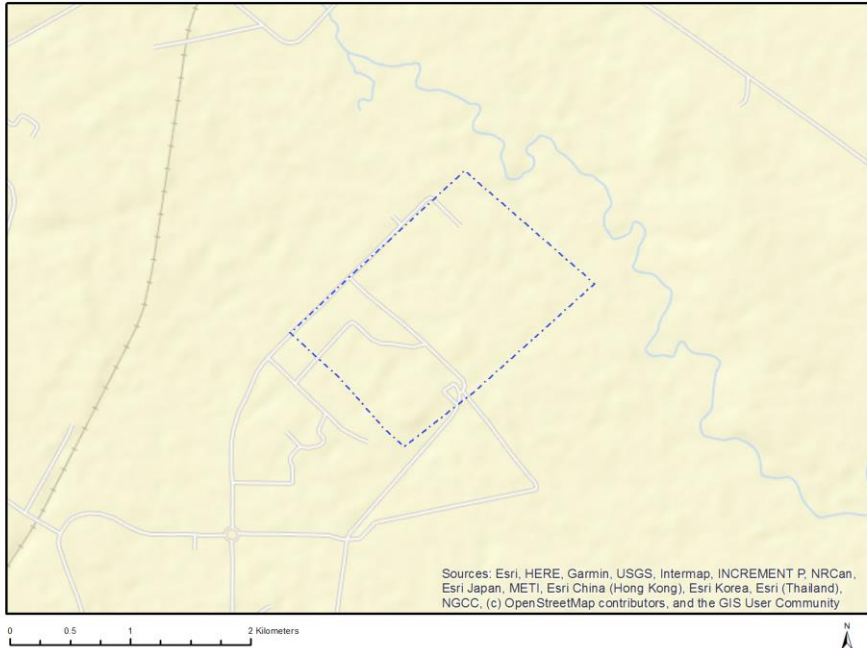
| | |
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| Environmental Management Frameworks relevant to the application | 5 |
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| Relevant development incentives, restrictions, exclusions or prohibitions | 5 |
| Map indicating proposed development footprint within applicable development incentive, restriction, exclusion or prohibition zones | 6 |
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Proposed Project Location

Orientation map 1: General location



Map of proposed site and relevant area(s)



Cadastral details of the proposed site

Property details:

| No | Farm Name | Farm/ Erf No | Portion | Latitude | Longitude | Property Type |
|----|-------------|--------------|---------|--------------|--------------|---------------|
| 1 | LEEUFONTEIN | 256 | 0 | 28°16'29.72S | 26°49'43.05E | Farm |
| 2 | LEEUBULT | 580 | 0 | 28°15'2.31S | 26°49'22.27E | Farm |
| 3 | LEEUFONTEIN | 256 | 0 | 28°16'26.56S | 26°49'36.97E | Farm Portion |
| 4 | LEEUBULT | 580 | 0 | 28°14'57.02S | 26°49'22.84E | Farm Portion |

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

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

| No | EIA Reference No | Classification | Status of application | Distance from proposed area (km) |
|----|------------------|----------------|-----------------------|----------------------------------|
| 1 | 12/12/20/2666/A | Solar PV | Approved | 9.1 |
| 2 | 12/12/20/2669 | Solar PV | Approved | 9.2 |
| 3 | 12/12/20/2668 | Solar PV | Approved | 2.7 |
| 4 | 12/12/20/2669/A | Solar PV | Approved | 9.2 |

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

| | | | | |
|---|---------------|----------|----------|-----|
| 5 | 12/12/20/2666 | Solar PV | Approved | 9.1 |
| 6 | 12/12/20/2667 | Solar PV | Approved | 2.7 |

Environmental Management Frameworks relevant to the application

No intersections with EMF areas found.

Environmental screening results and assessment outcomes

The following sections contain a summary of any development incentives, restrictions, exclusions or prohibitions that apply to the proposed development site as well as the most environmental sensitive features on the site based on the site sensitivity screening results for the application classification that was selected. The application classification selected for this report is:

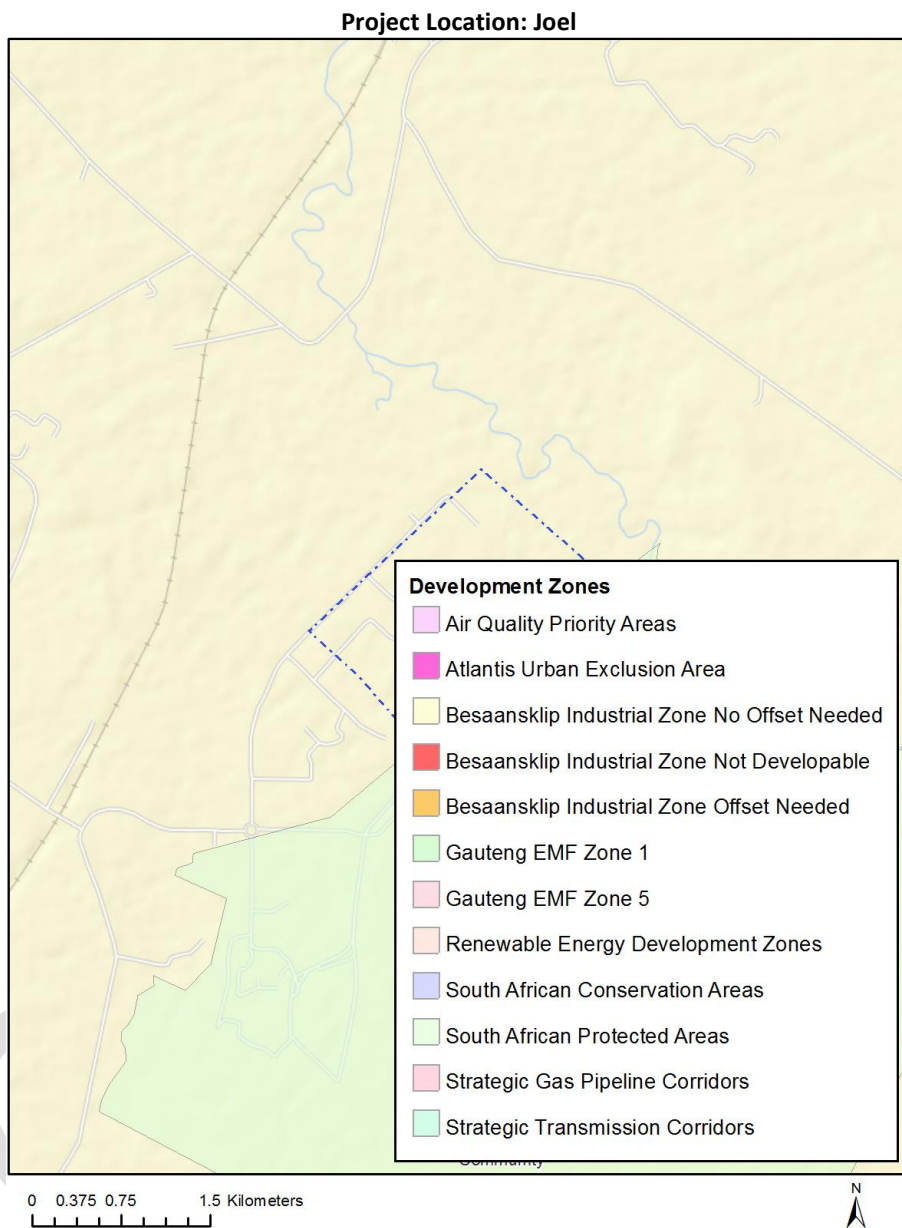
Utilities Infrastructure | Electricity | Generation | Renewable | Solar | PV.

Relevant development incentives, restrictions, exclusions or prohibitions

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

| Incentive, restriction or prohibition | Implication |
|---------------------------------------|---|
| South African Protected Areas | https://screening.environment.gov.za/ScreeningDownloads/DevelopmentZones/SAPAD_OR_2021_Q4_Metadata.pdf |

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



Proposed Development Area Environmental Sensitivity

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

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

| | | | | |
|--|---|--|---|---|
| Aquatic Biodiversity Theme | | | | X |
| Archaeological and Cultural Heritage Theme | | | | X |
| Avian Theme | | | | X |
| Civil Aviation (Solar PV) Theme | | | X | |
| Defence Theme | | | | X |
| Landscape (Solar) Theme | X | | | |
| Paleontology Theme | X | | | |
| Plant Species Theme | | | | X |
| RFI Theme | | | | X |
| Terrestrial Biodiversity Theme | X | | | |

Specialist assessments identified

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

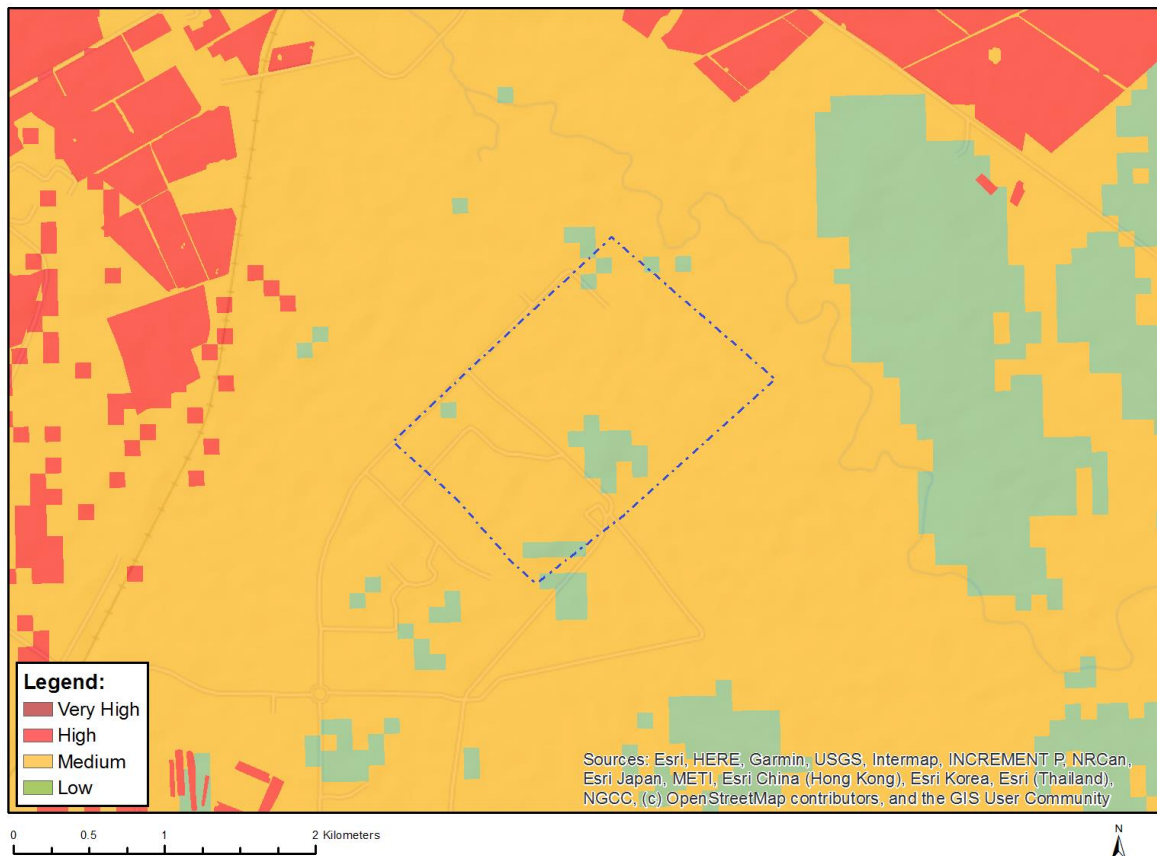
| N o | Specialist assessment | Assessment Protocol |
|------------|--|---|
| 1 | Agricultural Impact Assessment | https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_WindAndSolar_Agriculture_Assessment_Protocols.pdf |
| 2 | Landscape/Visual Impact Assessment | https://screening.environment.gov.za/ScreeningDownloads/AssessmentPro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

| | | |
|----|---------------------------|---|
| | Impact Assessment | |
| 7 | Civil Aviation Assessment | https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Civil_Aviation_Installations_Assessment_Protocols.pdf |
| 8 | Defense Assessment | https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Defence_Installations_Assessment_Protocols.pdf |
| 9 | RFI Assessment | https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf |
| 10 | Geotechnical Assessment | https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf |
| 11 | Socio-Economic Assessment | https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_General_Requirement_Assessment_Protocols.pdf |
| 12 | Plant Species Assessment | https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Plant_Species_Assessment_Protocols.pdf |
| 13 | Animal Species Assessment | https://screening.environment.gov.za/ScreeningDownloads/AssessmentProtocols/Gazetted_Animal_Species_Assessment_Protocols.pdf |

Results of the environmental sensitivity of the proposed area.

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

MAP OF RELATIVE AGRICULTURE THEME SENSITIVITY

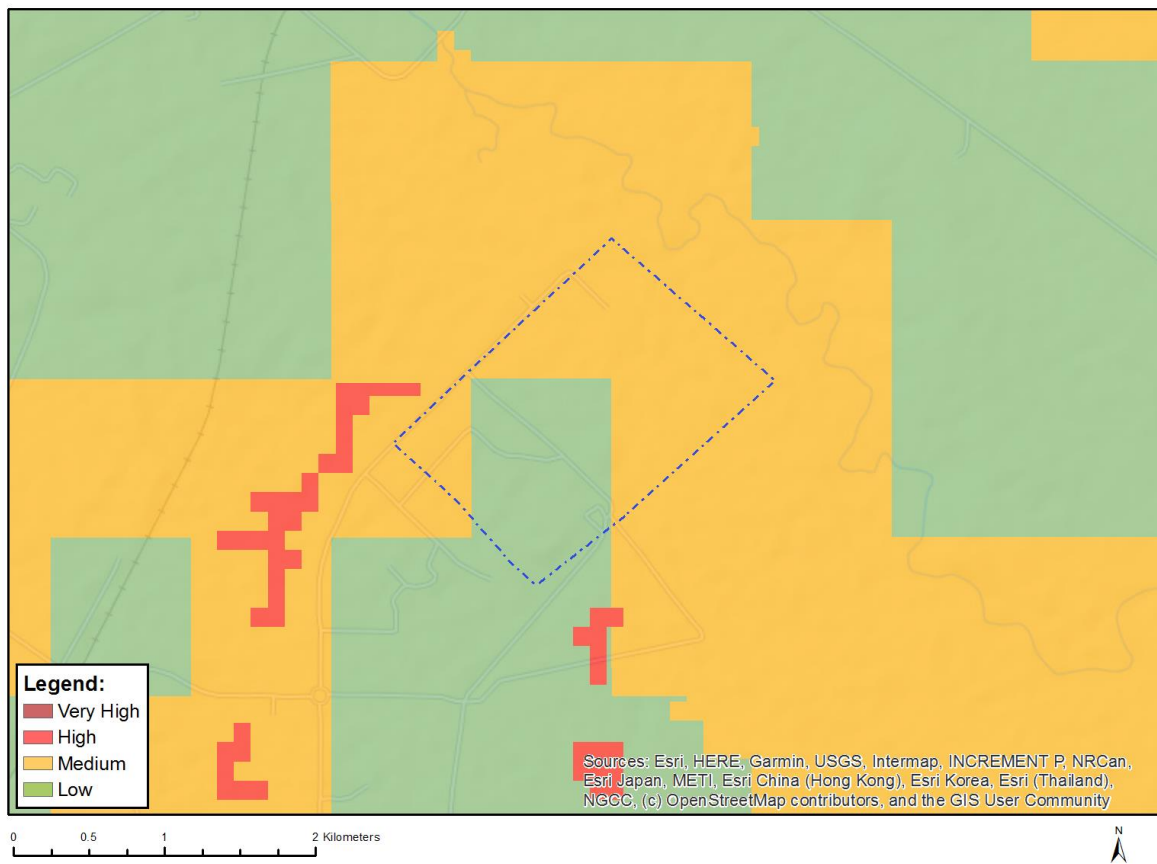


| Very High sensitivity | High sensitivity | Medium sensitivity | Low sensitivity |
|-----------------------|------------------|--------------------|-----------------|
| | | X | |

Sensitivity Features:

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

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



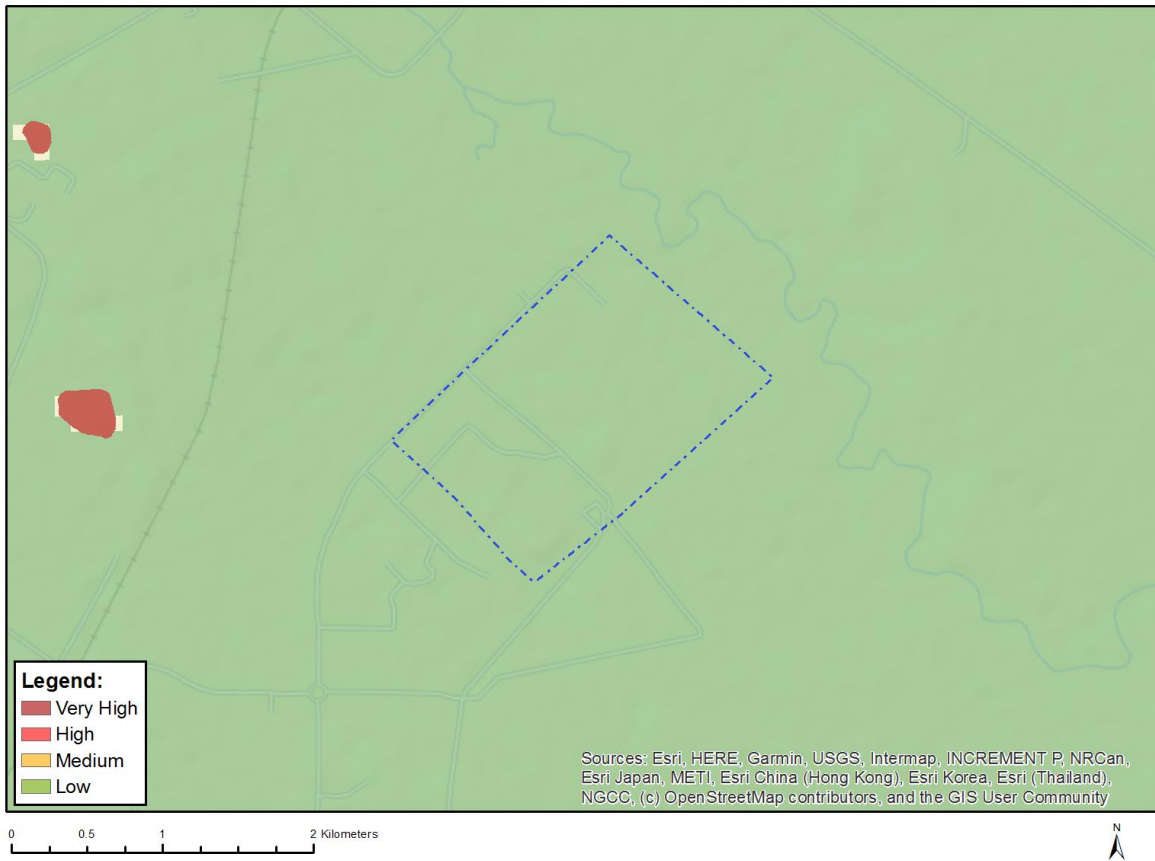
Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their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

| Very High sensitivity | High sensitivity | Medium sensitivity | Low sensitivity |
|-----------------------|------------------|--------------------|-----------------|
| | | X | |

Sensitivity Features:

| Sensitivity | Feature(s) |
|-------------|----------------------------------|
| Low | Subject to confirmation |
| Medium | Mammalia-Hydriectis maculicollis |

MAP OF RELATIVE AQUATIC BIODIVERSITY THEME SENSITIVITY

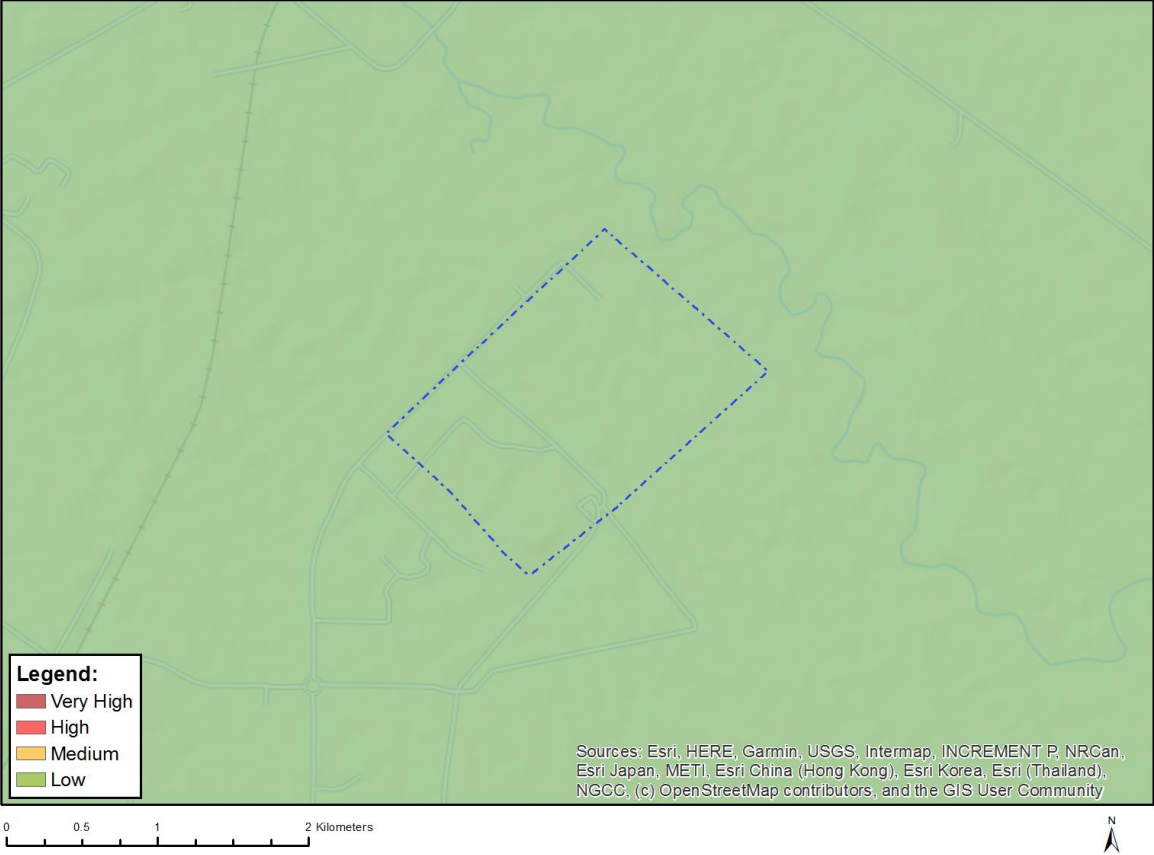


| Very High sensitivity | High sensitivity | Medium sensitivity | Low sensitivity |
|-----------------------|------------------|--------------------|-----------------|
| | | | X |

Sensitivity Features:

| Sensitivity | Feature(s) |
|-------------|-----------------|
| Low | Low sensitivity |

MAP OF RELATIVE ARCHAEOLOGICAL AND CULTURAL HERITAGE THEME SENSITIVITY

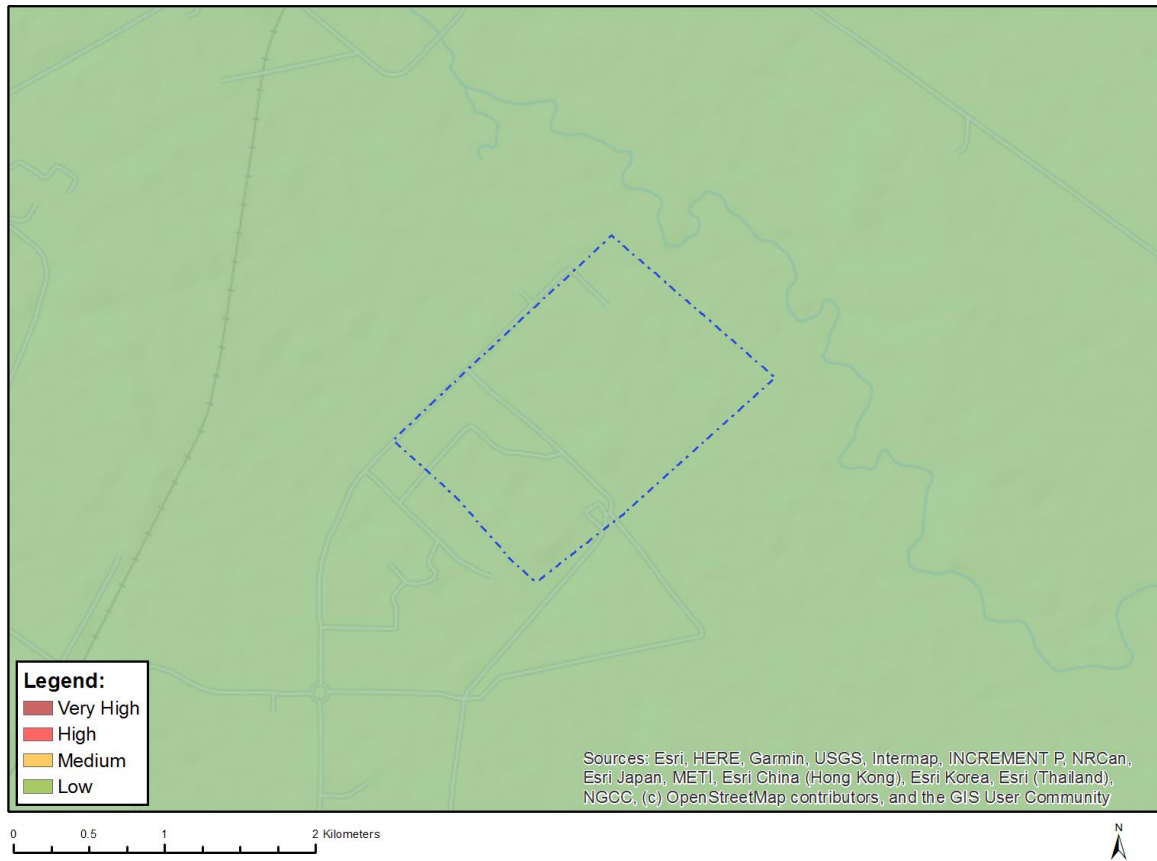


| Very High sensitivity | High sensitivity | Medium sensitivity | Low sensitivity |
|-----------------------|------------------|--------------------|-----------------|
| | | | X |

Sensitivity Features:

| Sensitivity | Feature(s) |
|-------------|-----------------|
| Low | Low sensitivity |

MAP OF RELATIVE AVIAN THEME SENSITIVITY

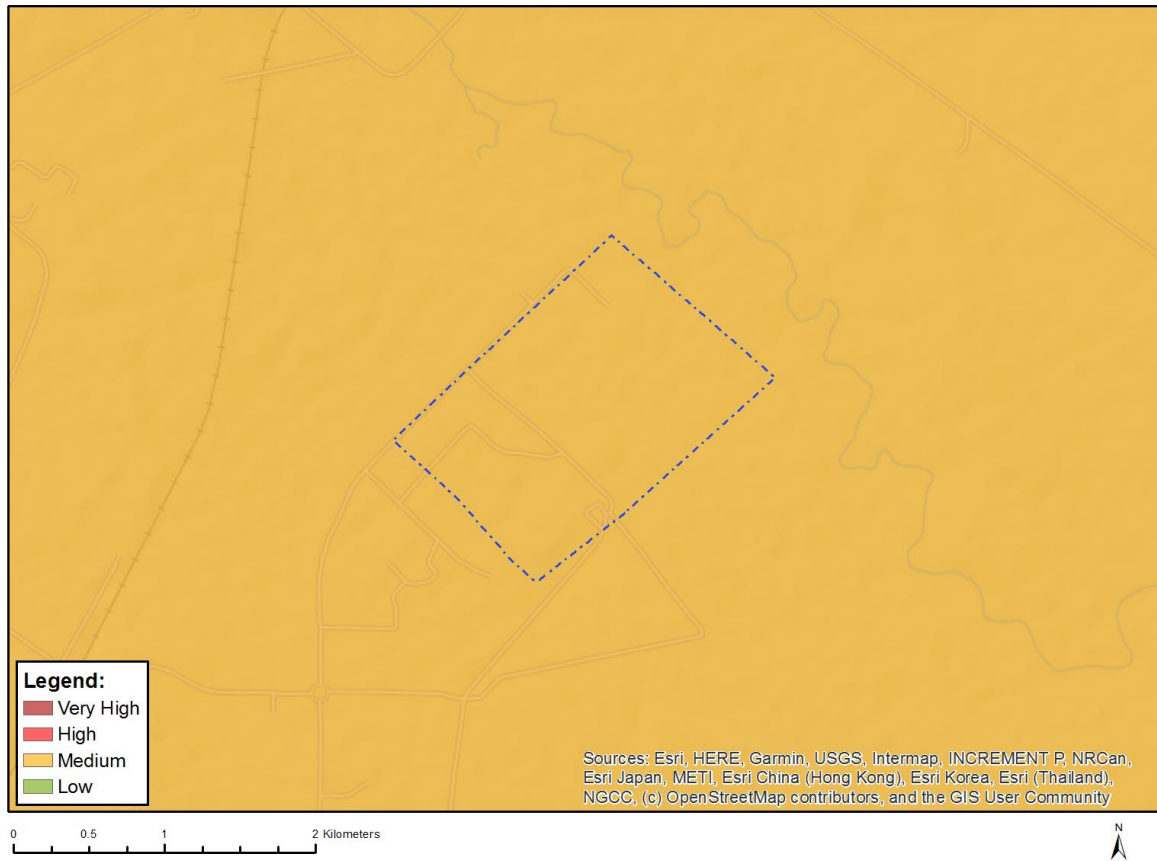


| Very High sensitivity | High sensitivity | Medium sensitivity | Low sensitivity |
|-----------------------|------------------|--------------------|-----------------|
| | | | X |

Sensitivity Features:

| Sensitivity | Feature(s) |
|-------------|-----------------|
| Low | Low Sensitivity |

MAP OF RELATIVE CIVIL AVIATION (SOLAR PV) THEME SENSITIVITY

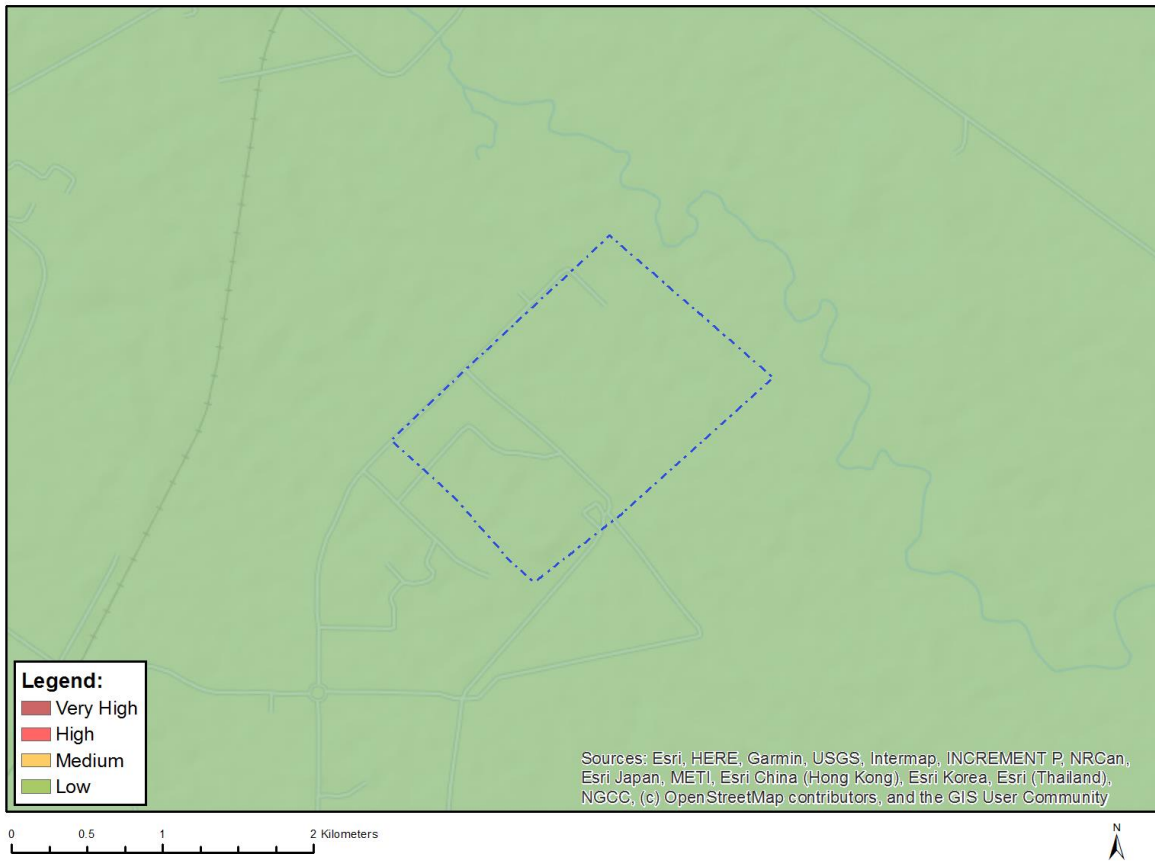


| Very High sensitivity | High sensitivity | Medium sensitivity | Low sensitivity |
|-----------------------|------------------|--------------------|-----------------|
| | | X | |

Sensitivity Features:

| Sensitivity | Feature(s) |
|-------------|--|
| Medium | Within 8 km of an other civil aviation aerodrome |

MAP OF RELATIVE DEFENCE THEME SENSITIVITY

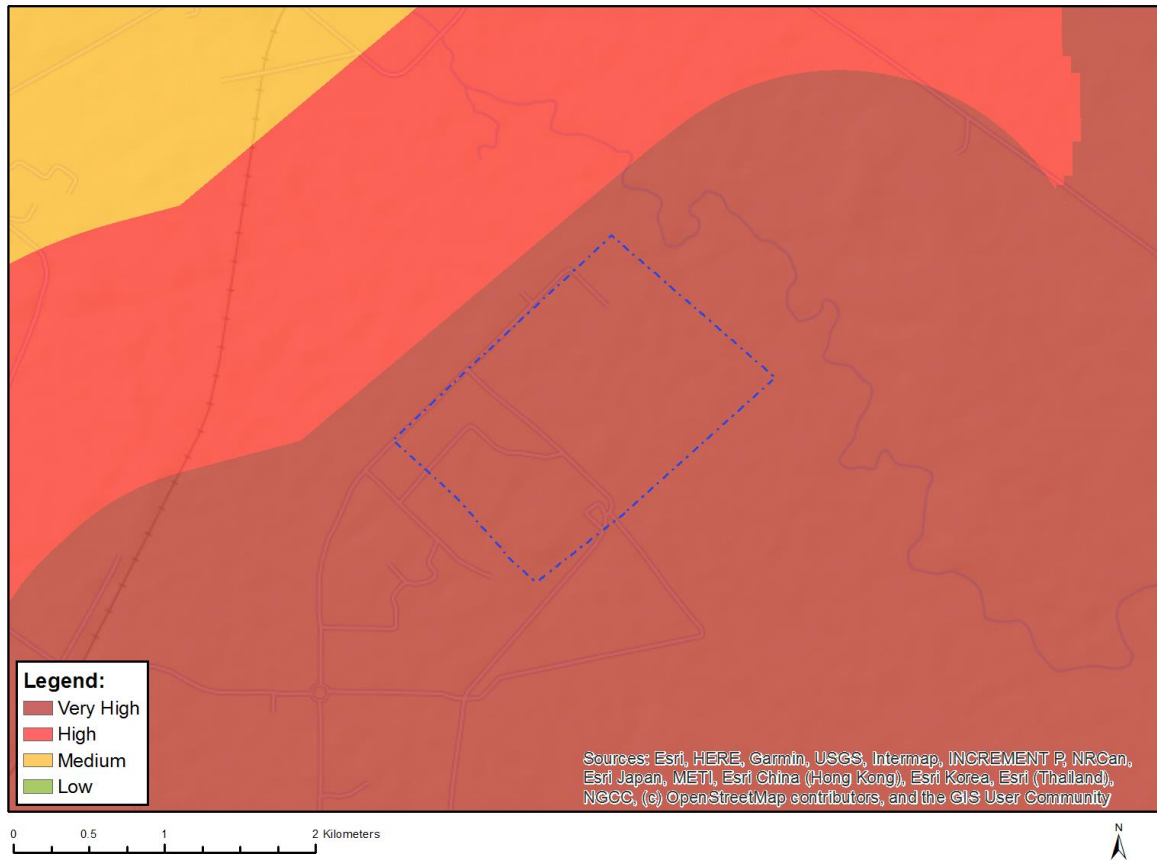


| Very High sensitivity | High sensitivity | Medium sensitivity | Low sensitivity |
|-----------------------|------------------|--------------------|-----------------|
| | | | X |

Sensitivity Features:

| Sensitivity | Feature(s) |
|-------------|-----------------|
| Low | Low sensitivity |

MAP OF RELATIVE LANDSCAPE (SOLAR) THEME SENSITIVITY

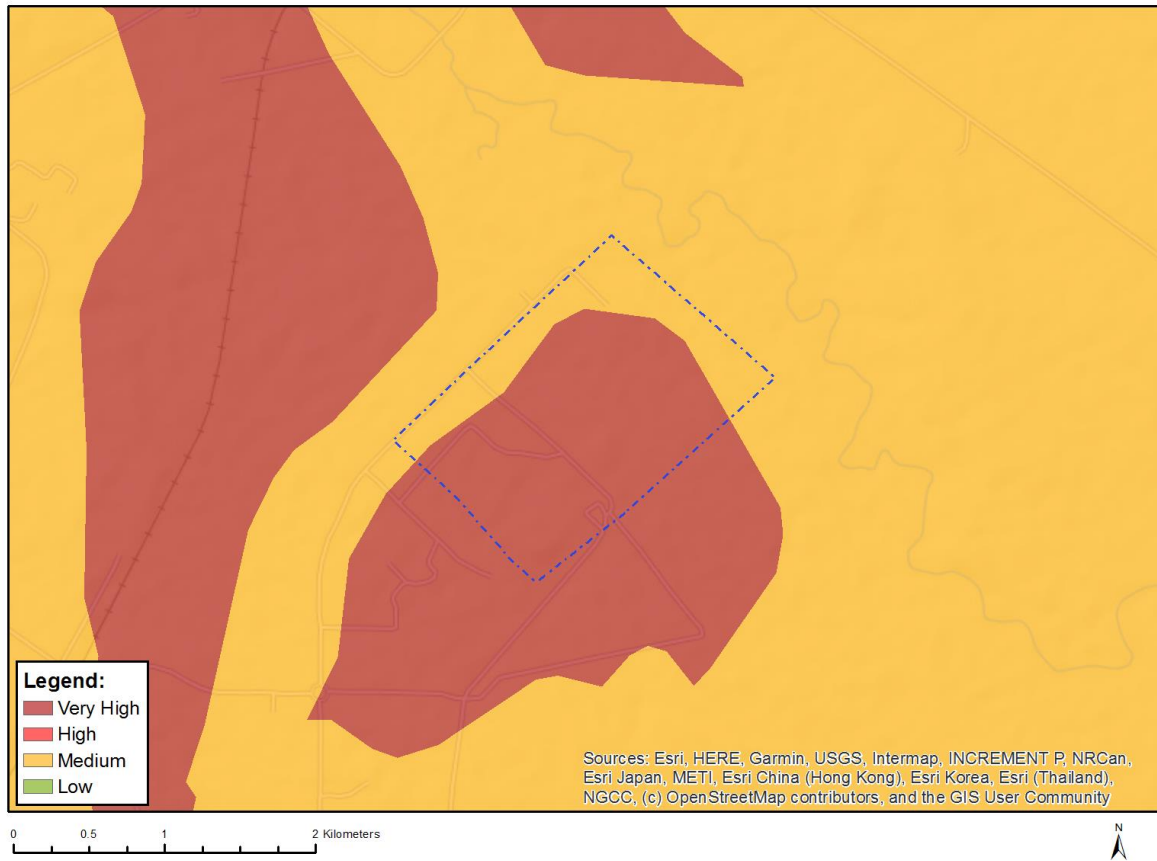


| Very High sensitivity | High sensitivity | Medium sensitivity | Low sensitivity |
|-----------------------|------------------|--------------------|-----------------|
| X | | | |

Sensitivity Features:

| Sensitivity | Feature(s) |
|-------------|-----------------------------------|
| Very High | Nature Reserve |
| Very High | Within 1.5 km of a nature reserve |

MAP OF RELATIVE PALEONTOLOGY THEME SENSITIVITY

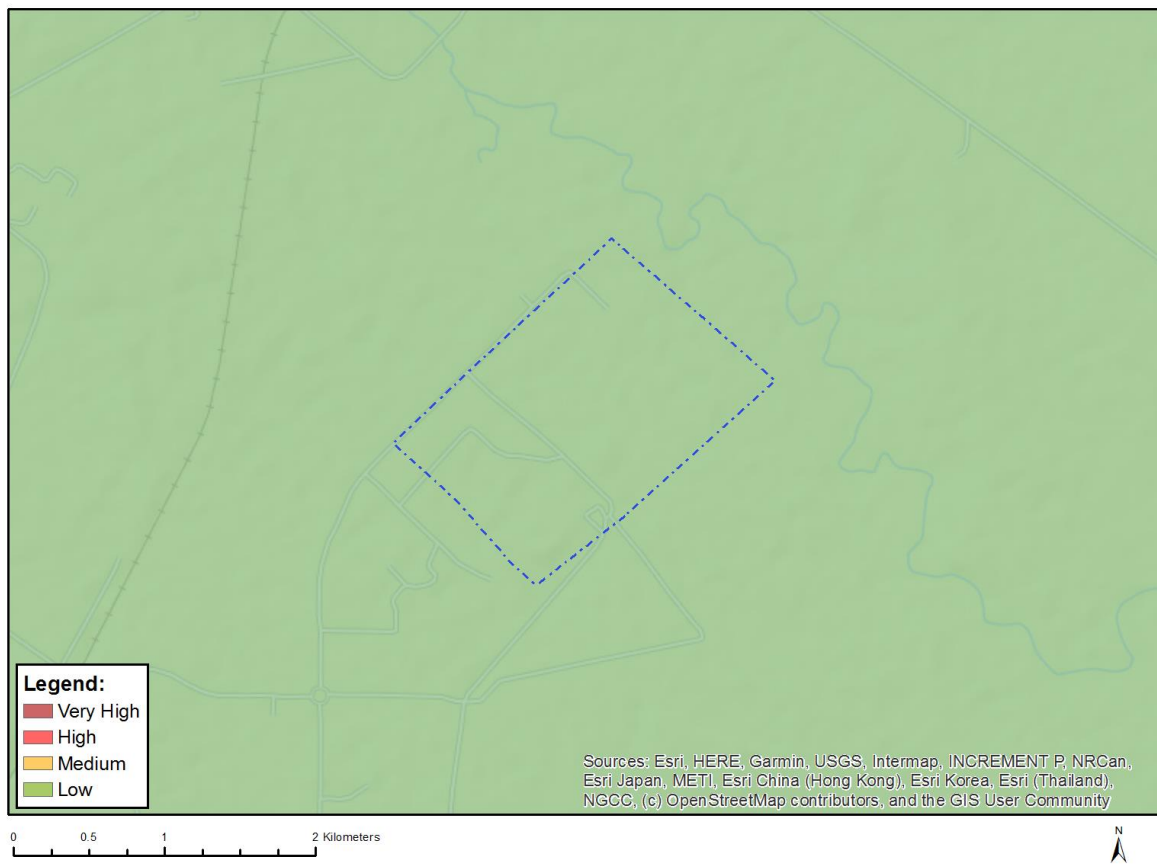


| Very High sensitivity | High sensitivity | Medium sensitivity | Low sensitivity |
|-----------------------|------------------|--------------------|-----------------|
| X | | | |

Sensitivity Features:

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

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



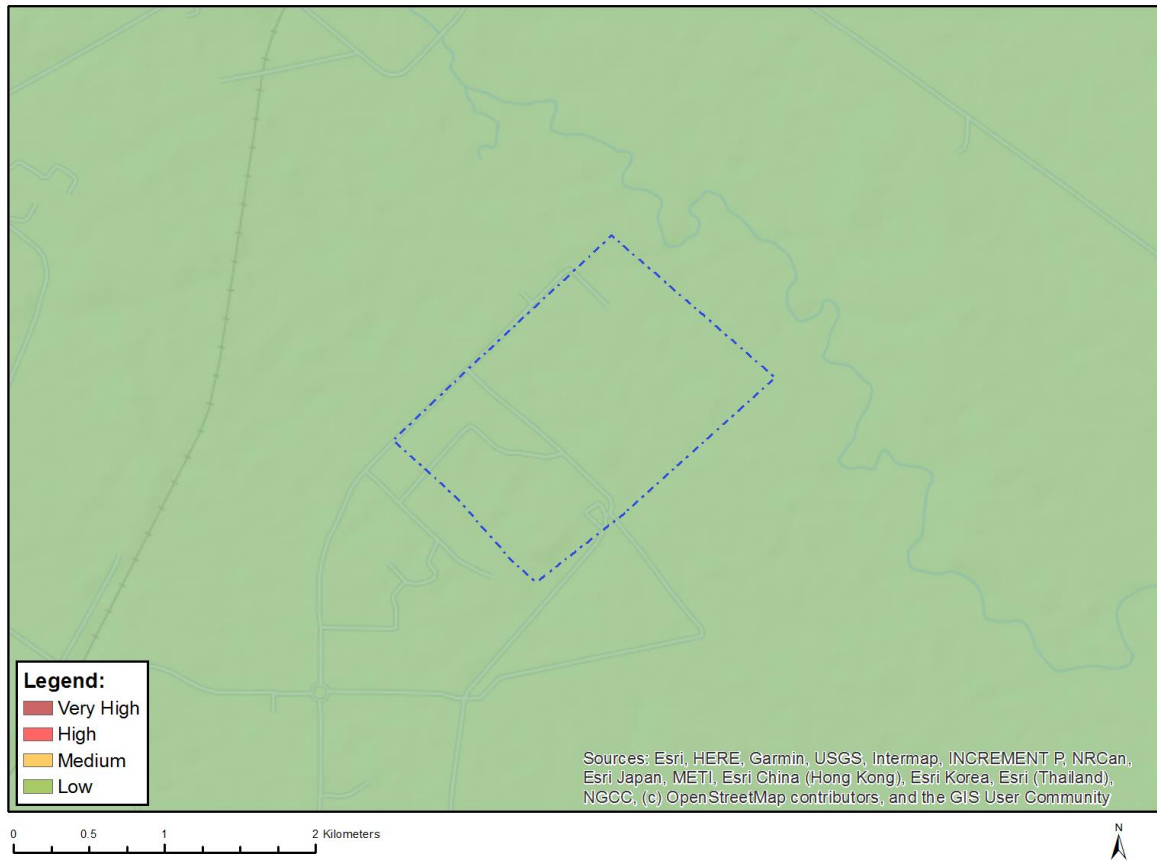
Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their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

| Very High sensitivity | High sensitivity | Medium sensitivity | Low sensitivity |
|-----------------------|------------------|--------------------|-----------------|
| | | | X |

Sensitivity Features:

| Sensitivity | Feature(s) |
|-------------|-----------------|
| Low | Low Sensitivity |

MAP OF RELATIVE RFI THEME SENSITIVITY

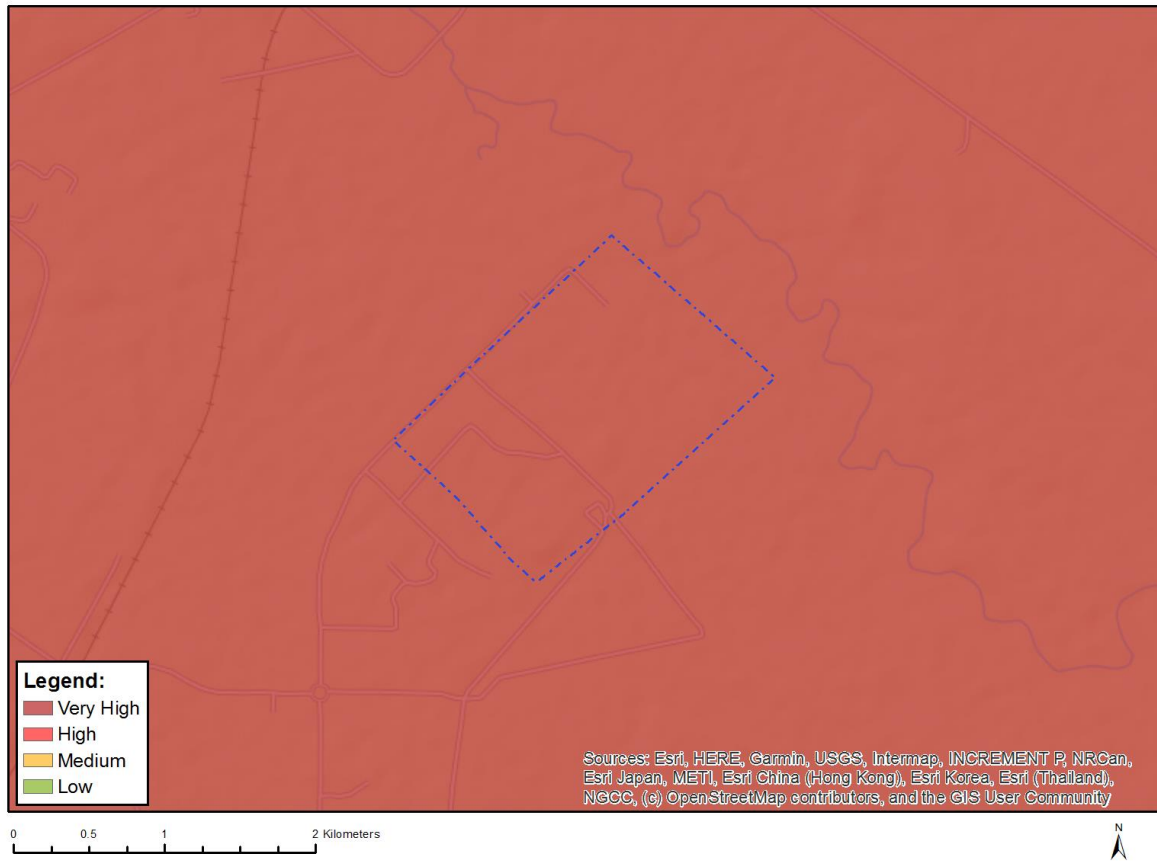


| Very High sensitivity | High sensitivity | Medium sensitivity | Low sensitivity |
|-----------------------|------------------|--------------------|-----------------|
| | | | X |

Sensitivity Features:

| Sensitivity | Feature(s) |
|-------------|-----------------|
| Low | Low sensitivity |

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



| Very High sensitivity | High sensitivity | Medium sensitivity | Low sensitivity |
|-----------------------|------------------|--------------------|-----------------|
| X | | | |

Sensitivity Features:

| Sensitivity | Feature(s) |
|-------------|------------------------------------|
| Very High | Critical biodiversity area 2 |
| Very High | Ecological support area 1 |
| Very High | Ecological support area 2 |
| Very High | Protected Areas Expansion Strategy |
| Very High | H. J. Joel Private Nature Reserve |

Appendix 5 – Grievance Mechanism for Public Complaints and Issues

GRIEVANCE MECHANISM / PROCESS

1. PURPOSE

This Grievance Mechanism has been developed to receive and facilitate the resolution of concerns and grievances regarding the project's environmental and social performance. The aim of the Grievance Mechanism is to ensure that grievances or concerns raised by stakeholders are addressed in a manner that:

- » Provides a predictable, accessible, transparent, and credible process to all parties, resulting in outcomes that are fair and equitable, accountable and efficient.
- » Promotes trust as an integral component of broader community relations activities.
- » Enables more systematic identification of emerging issues and trends, facilitating corrective action and pre-emptive engagement.

The aim of this Grievance Mechanism is to provide a process to address grievances in a manner that does not require a potentially costly and time-consuming legal process.

2. PROCEDURE FOR RECEIVING AND RESOLVING GRIEVANCES

The following proposed grievance procedures are to be complied with throughout the construction, operation and decommissioning phases of the project. These procedures should be updated as and when required to ensure that the Grievance Mechanism is relevant for the project and effective in providing the required processes.

- » Local landowners, communities and authorities must be informed in writing by the Developer of the grievance mechanism and the process by which grievances can be brought to the attention of the Developer through its designated representative. This must be undertaken with the commencement of the construction phase.
- » A company representative must be appointed as the contact person to which grievances can be directed. The name and contact details of the contact person must be provided to local landowners, communities and authorities when requested.
- » Project related grievances relating to the construction, operation and or decommissioning phases must be addressed in writing to the contact person. The contact person should assist local landowners and/or communities who may lack resources to submit/prepare written grievances, by recording grievances and completing written grievance notices where applicable, translating requests or concerns or by facilitating contact with relevant parties who can address the raised concerns. The following information should be obtained, as far as possible, regarding each written grievance, which may act as both acknowledgement of receipt as well as record of grievance received:
 - a. The name and contact details of the complainant.
 - b. The nature of the grievance.
 - c. Date raised, received, and for which the meeting was arranged.
 - d. Persons elected to attend the meeting (which will depend on the grievance).
 - e. A clear statement that the grievance procedure is, in itself, not a legal process. Should such avenues be desired, they must be conducted in a separate process and do not form part of this grievance mechanism.
- » The grievance must be registered with the contact person who, within 2 working days of receipt of the grievance, must contact the Complainant to discuss the grievance and, if required, agree on a suitable

date and venue for a meeting in order to discuss the grievances raised. Unless otherwise agreed, the meeting should be held within 2 weeks of receipt of the grievance.

- » The contact person must draft a letter to be sent to the Complainant acknowledging receipt of the grievance, the name and contact details of Complainant, the nature of the grievance, the date that the grievance was raised, and the date and venue for the meeting (once agreed and only if required).
- » A grievance register must be kept on site (in electronic format, so as to facilitate editing and updating), and shall be made available to all parties wishing to gain access thereto.
- » Prior to the meeting being held the contact person must contact the Complainant to discuss and agree on the parties who should attend the meeting, as well as a suitable venue. The people who will be required to attend the meeting will depend on the nature of the grievance. While the Complainant and or Developer are entitled to invite their legal representatives to attend the meeting/s, it should be made clear to all the parties involved in the process that the grievance mechanism process is not a legal process, and that if the Complainant invites legal representatives, the cost will be their responsibility. It is therefore recommended that the involvement of legal representatives be limited as far as possible, as a matter of last resort, and that this process be primarily aimed at stakeholder relationship management as opposed to an arbitration or litigation mechanism.
- » The meeting should be chaired by the Developer's representative appointed to address grievances. The Developer must supply and nominate a representative to capture minutes and record the meeting/s.
- » Draft copies of the minutes must be made available to the Complainant and the Developer within 5 working days of the meeting being held. Unless otherwise agreed, comments on the Draft Minutes must be forwarded to the company representative appointed to manage the grievance mechanism within 5 working days of receipt of the draft minutes.
- » The meeting agenda must be primarily the discussion of the grievance, avoidance and mitigation measures available and proposed by all parties, as well as a clear indication of the future actions and responsibilities, in order to put into effect, the proposed measures and interventions to successfully resolve the grievance.
- » In the event of the grievance being resolved to the satisfaction of all the parties concerned, the outcome must be recorded and signed off by the relevant parties. The record should provide details of the date of the meeting/s, the names of the people that attended the meeting/s, the outcome of the meeting/s, and where relevant, the measures identified to address the grievance, the party responsible for implementing the required measures, and the agreed-upon timeframes for the measures to be implemented.
- » In the event of a dispute between the Complainant and the Developer regarding the grievance, the option of appointing an independent mediator to assist with resolving the issue should be discussed. The record of the meeting/s must note that a dispute has arisen and that the grievance has not been resolved to the satisfaction of all the parties concerned.
- » In the event that the parties agree to appoint a mediator, the Developer will be required to identify three (3) mediators and forward the names and Curriculum Vitae (CVs) to the Complainant within 2 weeks of the dispute being declared. The Complainant, in consultation with the Developer, must identify the preferred mediator and agree on a date for the next meeting. The cost of the mediator must be borne by the Developer. The Developer must supply and nominate a representative to capture minutes and record the meeting/s.
- » In the event of the grievance, with the assistance of the mediator, being resolved to the satisfaction of all the parties concerned, the outcome must be recorded and signed off by the relevant parties, including the mediator. The record should provide details on the date of the meeting/s, the names of the people that attended the meeting/s, the outcome of the meeting/s, and where relevant, the

measures identified to address the grievance, the party responsible for implementing the required measures, and the agreed upon timeframes for the measures to be implemented.

- » In the event of the dispute not being resolved, the mediator must prepare a draft report that summaries the nature of the grievance and the dispute. The report should include a recommendation by the mediator on the proposed way forward with regard to the addressing the grievance.
- » The draft report must be made available to the Complainant and the Developer for comment before being finalised and signed by all parties, which signature may not be unreasonably withheld by either party. Unless otherwise agreed, comments on the draft report must be forwarded to the company representative appointed to manage the grievance mechanism within 5 working days. The way forward will be informed by the recommendations of the mediator and the nature of the grievance.

A Complaint is closed out when no further action is required, or indeed possible. Closure status must be classified and captured following mediation or successful resolution in the Complaints Register as follows:

- » Resolved. Complaints where a resolution has been agreed and implemented and the Complainant has signed the Confirmation Form.
- » Unresolved. Complaints where it has not been possible to reach an agreed resolution despite mediation.
- » Abandoned. Complaints where the Complainant is not contactable after one month following receipt of a Complaint and efforts to trace his or her whereabouts have been unsuccessful.

Appendix 6 - Alien Plant & Open Space Management Plan

ALIEN PLANT AND OPEN SPACE MANAGEMENT PLAN

1. PURPOSE

Invasive alien plant species pose the second largest threat to biodiversity after direct habitat destruction. The purpose of this Alien Plant and Open Space Management Plan is to provide a framework for the management of alien and invasive plant species during the construction and operation of the proposed Harmony Joel Solar PV Energy Facility. The broad objectives of the plan include the following:

- » Ensure alien plants do not become dominant in parts of the site, or the whole site, through the control and management of alien and invasive species presence, dispersal and encroachment.
- » Develop and implement a monitoring and eradication programme for alien and invasive plant species.
- » Promote the natural re-establishment and planting of indigenous species in order to retard erosion and alien plant invasion.

This plan should be updated throughout the lifecycle of the project, as required in order to ensure that appropriate measures are in place to manage and control the establishment of alien and invasive plant species and to ensure compliance with relevant legislation. This plan should be implemented with a specific focus on sensitive areas.

2. LEGISLATIVE CONTEXT

Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)

In terms of the amendments to the regulations under the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA), all declared alien plant species must be effectively controlled. Landowners are legally responsible for the control of invasive alien plants on their properties. In terms of this Act, alien invasive plant species are ascribed to one of the following categories:

- » Category 1: Prohibited and must be controlled.
- » Category 2 (commercially used plants): May be grown in demarcated areas provided that there is a permit and that steps are taken to prevent their spread.
- » Category 3 (ornamentally used plants): May no longer be planted. Existing plants may be retained as long as all reasonable steps are taken to prevent the spreading thereof, except within the flood line of watercourses and wetlands.

National Environmental Management: Biodiversity Act, 2004 (Act No.10 of 2004)

The National Environmental Management: Biodiversity Act, 2004 (Act No.10 of 2004) (NEM:BA) regulates all invasive organisms in South Africa, including a wide range of fauna and flora. Regulations have been published in Government Notices GNR 506, 507, 508 and 509 of 2013 under NEM:BA. According to this Act and the regulations, any species designated under Section 70 cannot be propagated, grown, bought, or sold without a permit. Below is an explanation of the three categories:

- » **Category 1a:** Invasive species requiring compulsory control. Any specimens of Category 1a listed species need, by law, to be eradicated from the environment. No permits will be issued.

- » **Category 1b:** Invasive species requiring compulsory control as part of an invasive species control programme. Remove and destroy. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme. No permits will be issued.
- » **Category 2:** Invasive species regulated by area. A demarcation permit is required to import, possess, grow, breed, move, sell, buy or accept as a gift any plants listed as Category 2 plants. No permits will be issued for Category 2 plants to exist in riparian zones.
- » **Category 3:** Invasive species regulated by activity. An individual plant permit is required to undertake any of the following restricted activities (import, possess, grow, breed, move, sell, buy or accept as a gift) involving a Category 3 species. No permits will be issued for Category 3 plants to exist in riparian zones.

The following guide is a useful starting point for the identification of alien plant species: Bromilow, C. 2010. Problem Plants and Alien Weeds of South Africa. Briza, Pretoria.

It is important to note that alien plant species that are regulated in terms of the CARA as weeds and invader plants are exempted from NEM:BA. This implies that the provisions of the CARA in respect of listed weed and invader plants supersede those of NEM: BA.

3. ALIEN PLANT MANAGEMENT PRINCIPLES

3.1. Prevention and early eradication

A prevention strategy should be considered and established, including regular surveys and monitoring for invasive alien plants, effective rehabilitation of disturbed areas and prevention of unnecessary disturbance of natural areas.

Monitoring plans should be developed which are designed to identify Invasive Alien Plant Species already on site, as well as those that are introduced to the site by the construction activities. Keeping up to date on which weeds are an immediate threat to the site is important, but efforts should be planned to update this information on a regular basis. When additional Invasive Alien Plant Species are recorded on site, an immediate response of locating the site for future monitoring and either hand-pulling the weeds or an application of a suitable herbicide (where permissible only) should be planned. It is, however, better to monitor regularly and act swiftly than to allow invasive alien plants to become established on site.

3.2. Containment and control

If any alien invasive plants are found to become established on-site, action plans for their control should be developed, depending on the size of the infestations, budgets, manpower considerations and time. Separate plans of control actions should be developed for each location and/or each species. Appropriately registered chemicals and other possible control agents should be considered in the action plans for each site/species. The use of chemicals is not recommended for any wetland areas. Herbicides should be applied directly to the plant and not to the soil. The key is to ensure that no invasions get out of control. Effective containment and control will ensure that the least amount of energy and resources are required to maintain this status over the long term. This will also be an indicator that natural systems are impacted to the smallest degree possible.

3.3. General Clearing and Guiding Principles

Alien species control programmes are long-term management projects and should consist of a clearing plan which includes follow up actions for rehabilitation of the cleared area. The lighter infested areas should be cleared first to prevent the build-up of seed banks. Pre-existing dense mature stands ideally should be left for last, as they probably will not increase in density or pose a greater threat than they are currently. Collective management and planning with neighbours may be required in the case of large woody invaders as seeds of alien species are easily dispersed across boundaries by wind or watercourses. All clearing actions should be monitored and documented to keep records of which areas are due for follow-up clearing.

i. Clearing Methods

Different species require different clearing methods such as manual, chemical, or biological methods or a combination of both. Care should however be taken that the clearing methods used do not encourage further invasion and that they are appropriate to the specific species of concern. As such, regardless of the methods used, disturbance to the soil should be kept to a minimum.

Fire should not be used for alien species control or vegetation management at the site. The best-practice clearing method for each species identified should be used.

» Mechanical control

This entails damaging or removing the plant by physical action. Different techniques could be used, e.g., uprooting, felling, slashing, mowing, ringbarking or bark stripping. This control option is only really feasible in sparse infestations or on a small scale, and for controlling species that do not coppice after cutting. Species that tend to coppice, need to have the cut stumps or coppice growth treated with herbicides following the mechanical treatment. Mechanical control is labour intensive and therefore expensive and could cause severe soil disturbance and erosion.

» Chemical Control

Although it is usually preferable to use manual clearing methods where possible, such methods may create an additional disturbance which stimulates alien plant invasion and may also be ineffective for many woody species that re-sprout. Where herbicides are to be used, the impact of the operation on the natural environment should be minimised by observing the following:

- * Area contamination must be minimised by careful, accurate application with a minimum amount of herbicide to achieve good control.
- * All care must be taken to prevent contamination of any water bodies. This includes due care in storage, application, cleaning equipment and disposal of containers, products, and spray mixtures.
- * Equipment should be washed where there is no danger of contaminating water sources and washings carefully disposed of at a suitable site.
- * To avoid damage to indigenous or other desirable vegetation, products should be selected that will have the least effect on non-target vegetation.
- * Coarse droplet nozzles should be fitted to avoid drift onto neighbouring vegetation.
- * The appropriate health and safety procedures should also be followed regarding the storage, handling, and disposal of herbicides.
- * The use of chemicals is not recommended for wetland areas.

For all herbicide applications, the following Regulations and guidelines should be followed:

- * Working for Water: Policy on the Use of Herbicides for the Control of Alien Vegetation.
- * Pesticide Management Policy for South Africa published in terms of the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947) (ARSRA)– GNR 1120 of 2010.
- * South African Bureau of Standards (SABS), South African National Standard (SANS) 10206 (2010).

According to Government Notice No. 13424 dated 26 July 1992, it is an offence to “*acquire, dispose, sell or use an agricultural or stock remedy for a purpose or in a manner other than that specified on the label on a container thereof or on such a container*”.

Contractors using herbicides need to have a valid Pest Control Operators License (limited weeds controller) according to the Fertilizer, Farm Feeds, ARSRA. This is regulated by the Department of Agriculture, Forestry and Fisheries (DAFF).

» **Biological control**

Biological weed control consists of the use of natural enemies to reduce the vigour or reproductive potential of an invasive alien plant. Biological control agents include insects, mites, and micro-organisms such as fungi or bacteria. They usually attack specific parts of the plant, either the reproductive organs directly (flower buds, flowers, or fruit) or the seeds after they have dropped. The stress caused by the biological control agent may kill a plant outright or it might impact the plant's reproductive capacity. In certain instances, the reproductive capacity is reduced to zero and the population is effectively sterilised. All of these outcomes will help to reduce the spread of the species.

To obtain biocontrol agents, provincial representatives of the Working for Water Programme or the Directorate: Land Use and Soil Management (LUSM), DAFF can be contacted.

3.4. General management practices

The following general management practices should be encouraged or strived for:

- » Establish an ongoing monitoring programme for the construction phase to detect and quantify any alien species that may become established.
- » Alien vegetation regrowth on areas disturbed by construction must be immediately controlled.
- » Care must be taken to avoid the introduction of alien invasive plant species to the site. Particular attention must be paid to imported material such as building sand or dirty earth-moving equipment. Stockpiles should be checked regularly and any weeds emerging from material stockpiles should be removed.
- » Cleared areas that have become invaded by alien species can be sprayed with appropriate herbicides provided that these herbicides break down on contact with the soil. Residual herbicides should not be used.
- » The effectiveness of vegetation control varies seasonally, and this is also likely to impact alien species. Control early in the wet season will allow species to re-grow, and follow-up control is likely to be required. It is tempting to leave control until late in the wet season to avoid follow-up control. However, this may allow alien species to set seed before control, and hence will not contribute towards reducing alien species abundance. Therefore, vegetation control should be aimed at the middle of the wet season, with a follow-up event towards the end of the wet season. There are no

exact dates that can be specified here as each season is unique and management must therefore respond according to the state and progression of the vegetation.

- » Alien plant management is an iterative process, and it may require repeated control efforts to significantly reduce the abundance of a species. This is often due to the presence of large and persistent seed banks. However, repeated control usually results in rapid decline once seed banks become depleted.
- » Some alien species are best individually pulled by hand. Regular vegetation control to reduce plant biomass within the site should be conducted. This should be timed so as to coincide with the critical growth phases of the most important alien species on site. This will significantly reduce the cost of alien plant management as this should contribute towards the control of the dominant alien species and additional targeted control will be required only for a limited number of species.
- » No alien species should be cultivated on-site. If vegetation is required for aesthetic purposes, then non-invasive, water-wise locally occurring species should be used.
- » During operation, surveys for alien species should be conducted regularly. It is recommended that this be undertaken every 6 months for the first two years after construction and annually thereafter. All alien plants identified should be cleared using appropriate means.

3.5. Monitoring

In order to assess the impact of clearing activities, rehabilitation efforts, follow-ups and monitoring must be undertaken. This section provides a description of a possible monitoring programme that will provide an assessment of the magnitude of alien plant invasion on site, as well as an assessment of the efficacy of the management programme.

In general, the following principles apply for monitoring:

- » Photographic records must be kept of areas to be cleared prior to work starting and at regular intervals during initial clearing activities. Similarly, photographic records should be kept of the area from immediately before and after follow-up clearing activities. Rehabilitation processes must also be recorded.
- » Simple records must be kept of daily operations, e.g., area/location cleared, labour units and, if ever used, the amount of herbicide used.
- » It is important that, if monitoring results in detection of invasive alien plants, that this leads to immediate action.

The following monitoring should be implemented to ensure management of alien invasive plant species.

Construction Phase

| Monitoring Action | Indicator | Timeframe |
|--|--|--|
| Document alien species present at the site | List of alien plant species | Pre-construction Monthly during Summer and Autumn (Middle November to end of March) 3 Monthly during Winter and Spring |
| Document alien plant distribution | Alien plant distribution map within priority areas | 3 Monthly |
| Document & record alien plant control measures implemented | Record of clearing activities | 3 Monthly |

Operation Phase

| Monitoring Action | Indicator | Timeframe |
|---|--|------------------|
| Document alien plant species distribution and abundance over time at the site | Alien plant distribution map | Biannually |
| Document alien plant control measures implemented & success rate achieved | Records of control measures and their success rate. A decline in alien distribution and cover over time at the site | Biannually |
| Document rehabilitation measures implemented, and success achieved in problem areas | Decline in vulnerable bare areas over time | Biannually |

Appendix 7 - Re-Vegetation and Habitat Rehabilitation Plan

REVEGETATION AND HABITAT REHABILITATION PLAN

1. PURPOSE

The purpose of the Rehabilitation Plan is to ensure that areas cleared or impacted during construction activities within the development footprint for the Harmony Joel Solar PV Energy Facility that are not required for operation are rehabilitated to their original state before the operation phase commences, and that the risk of erosion from these areas is reduced. The purpose of the Rehabilitation Plan for the development footprint can be summarised as follows:

- » Achieve long-term stabilisation of all disturbed areas.
- » Re-vegetate all disturbed areas with suitable local plant species.
- » Minimise visual impact of disturbed areas.
- » Ensure that disturbed areas are rehabilitated to a condition similar to that found prior to disturbance.

This Rehabilitation Plan should be read in conjunction with other site-specific plans, including the Erosion Management Plan, Alien Invasive Management Plan and Plant Rescue and Protection Plan. Prior to the commencement of construction, a detailed Rehabilitation Plan and Method Statement for the site should be compiled with the aid of a suitably qualified, professionally registered specialist (with a botanical or equivalent qualification).

2. RELEVANT ASPECTS OF THE SITE

The study area is situated between the towns of Theunissen (approximately 20 km) and Virginia (approximately 15 km) and within the Joel Gold mining operations. The study area is fairly large with an approximate extent of 200 hectares and dominated by thicket, of which a large portion are considered riparian thicket associated with the Doring River adjacent to the site. The majority of the site still consists of natural vegetation without previous modification although mining operations situated on and around the site do result in transformation of the surroundings.

From the description of the area it is clear that the site still consists of natural vegetation with only small portions of it having been transformed. The natural vegetation types in the area, Highveld Alluvial Vegetation and Central Free State Grassland are both only listed as being of Least Concern and is therefore not of high conservation value. The area is also listed an Ecological Support Area and therefore the area is not essential to meeting conservation targets but forms part of the functioning of the Doring River adjacent to the site. The site would therefore have an overall Moderate level of sensitivity (Appendix A: Map 4). However, the Doring River itself is considered a highly sensitive system but which will be discussed in detail in the wetland assessment section of the report. It would also be important to accurately determine the 1:100 year floodline of the river and exclude it from development or where development encroaches into the floodline of the river, that the necessary flood protection structures be implemented.

The development will therefore result in the loss of natural vegetation but which is considered to have only a moderate conservation value. The development would therefore still result in significant impacts but which is unlikely to exceed moderate values. The areas surrounding the site does still contain fairly extensive natural portions though mining operations and agricultural transformation does contribute toward a moderate degree of cumulative transformation. The proposed solar development would therefore not result in a high

cumulative impact though would certainly contribute toward the overall cumulative transformation of the area.

Central Free State Grassland and Highveld Alluvial Vegetation

The majority of the development footprint consists of grassland, which is characterised by undulating plains dominated by grassland while lower lying areas may be affected by increased encroachment by the tree, *Vachellia karroo*, where overgrazing and trampling occurs. The lower lying areas along the Doring River and Theronspruit, consists of alluvial vegetation. This vegetation type is characterised by flat topography with riparian thickets dominated by *Vachellia karroo*, accompanied by seasonally flooded grassland and disturbed herblands often dominated by exotic weeds. It was concluded by the ecologist that the area consists of a mixture of Central Free State Grassland and Highveld Alluvial Vegetation which may also have been affected by increased encroachment of *Vachellia karroo* as a result of overgrazing and trampling.

The thicket layer is dominated to a large degree by *Vachellia karroo* (Sweetthorn) and as discussed in the previous paragraph, this is a natural component of the vegetation though may have increased in density due to previous overgrazing and trampling.

- » **Trees and shrubs:** *Diospyros lycioides*, *Ziziphus mucronata*, *Searsia pyroides*, *Asparagus larcinus* and *Searsia lancea*.
- » **Climax grasses:** *Themeda triandra*, *Cymbopogon pospischillii*, *Eragrostis chloromelas*, *Digitaria eriantha*, *Fingerhuthia africana* and *Themeda triandra*.
- » **Pioneer grasses:** *Aristida congesta*, *Chloris virgata*, *Eragrostis echinochloide*, *Melinis nerviglumis* and *Eragrostis gummiflva*.
- » **Riparian grasses:** *Panicum coloratum*, *Setaria sphacelatum* and *Cynodon dactylon*.
- » **Herbaceous component:** *Nidorella resedifolia*, *Solanum incanum*, *Blepharis subvolubilis*, *Gomphocarpus fruticosus*, *Hermannia depressa*, *Sebaea pentandra*, *Salvia verbenaca* and *Arctotis arctotoides*.
- » **Geophytic species:** *Moraea pallida*, *Oxalis depressa*, *Boophone distichia*, *Eriospermum porphyrium*, *Colchicum burkei*, *Eucomis autumnalis*, *Bulbine abyssinica* and *Chlorophytum sp.* Of these, *B. distichia* and *E. autumnalis* are also listed as protected in the Free State Province and are therefore of significant conservation value.
- » **Protected trees:** Wild Olive Tree (*Olea europaea subsp. africana*)
- » **Exotic weeds:** *Bidens bipinnata*, *Tagetes minuta*, *Conyza bonariensis*, *Opuntia humifusa*, *Xanthium spinosum*, *Verbena bonariensis* and *Verbena tenuisecta*.
- » **Invasive plants:** *Melia azedarach*, *Tamarix chinensis* and *Cortaderia selloana*

The site for the proposed solar development is listed as being an Ecological Support Areas 1 & 2 (ESA 1 & 2). A Critical Biodiversity Area 2 (CBA 2) is situated to the west of the site and marginally intersects with the western border of the site. This CBA 2 is associated with surrounding natural grassland of Vaal-Vet Sandy Grassland, an Endangered vegetation type though the marginal portion extending into the study area overlaps with the existing mining plant and is therefore not relevant to the development.

3. REHABILITATION METHODS AND PRACTICES

The following general management practices should be encouraged or strived for:

- » Clearing of invaded areas should be conducted as per the Alien Management Plan, included in the Environmental Management Programme (EMPr).
- » No harvesting of vegetation may be undertaken outside the area to be disturbed by construction activities.
- » Indigenous plant material must be kept separate from alien material.
- » Indigenous seeds may be harvested for purposes of revegetation in areas that are free of alien invasive vegetation, either at the project area prior to clearance or from suitable neighbouring sites.
- » Topsoil should be reserved wherever possible on the project area, to be utilised during rehabilitation.
- » Sods used for revegetation should be obtained directly from the project area, but not from the sensitive areas. Sods should contain at least a 50mm topsoil layer and be minimally disturbed, in particular to existing root systems. Sods must ideally be obtained from areas as close as possible to the region that is to be rehabilitated.
- » Water used for the irrigation of re-vegetated areas should be free of chlorine and other pollutants that might have a detrimental effect on the plants.
- » All seeded, planted, or sodded grass areas and all shrubs or trees planted are to be irrigated at regular intervals.
- » On steep slopes and areas where seed and organic matter retention is low, it is recommended that soil savers are used to stabilise the soil surface. Soil savers are man-made materials, usually constructed of organic material such as hemp or jute and are usually applied in areas where traditional rehabilitation techniques are not likely to succeed.
- » In areas where soil saver is used, it should be pegged down to ensure that it captures soil and organic matter flowing over the surface.
- » The final rehabilitated area should resemble the current composition and structure of the soil as far as practicably possible.
- » Progressive rehabilitation is an important element of the rehabilitation strategy and should be implemented where feasible.
- » No construction equipment, vehicles or unauthorised personnel should be allowed onto areas that have been rehabilitated.
- » Where rehabilitation sites are located within actively grazed areas, they should be fenced off, this must be undertaken in consultation with the landowner.
- » Any runnels, erosion channels or wash-aways developing after revegetation should be backfilled and consolidated and the areas restored to a proper stable condition.
- » Re-vegetated areas should be monitored frequently. Where signs of inadequate surface coverage are evident after two growing seasons, re-vegetation should be done from scratch. Adequate recovery must be assessed by a qualified botanist or rehabilitation specialist.
- » The stockpiled vegetation from the clearing operations should be reduced to mulch where possible and retained along with topsoil to encourage seed bank regrowth and soil fertility.
- » Mulches must be collected in such a manner as to restrict the loss of seed.
- » Mulch must be stored for as short a period as possible.
- » Mulch is to be harvested from areas that are to be denuded of vegetation during construction activities, provided that they are free of seed-bearing alien invasive plants.
- » Where herbicides are used to clear vegetation, species-specific chemicals should be applied to individual plants only. General spraying should be strictly prohibited, and only the correct herbicide type should be applied.
- » Once rehabilitated, areas should be protected to prevent trampling and erosion.
- » Fencing should be removed once a sound vegetative cover has been achieved.

4. MONITORING AND FOLLOW-UP ACTION

Throughout the lifecycle of the development, regular monitoring and adaptive management must be in place to detect any new degradation of rehabilitated areas. During the construction phase, the Environmental Office (EO) and Engineering, Procurement and Construction (EPC) Contractor will be responsible for initiating and maintaining a suitable monitoring system. Once the development is operational, the Developer / O&M Operator will need to identify a suitable entity that will be able to take over and maintain the monitoring cycle and initiate adaptive management as soon as it is required. Monitoring personnel must be adequately trained.

The following are the minimum criteria that should be monitored:

- » Associated nature and stability of surface soils.
- » Re-emergence of alien and invasive plant species. If noted, remedial action must be taken immediately, as per the alien management plan and mitigation measures contained within the EMPr.

Rehabilitation success, monitoring and follow-up actions are important to achieve the desired cover and soil protection. The following monitoring protocol is recommended:

- » Rehabilitated areas should be monitored (responsibility of the EO) on a weekly basis throughout the construction phase and on a monthly basis thereafter and to the point where the area has been rehabilitated to a satisfactory level.
- » Ensure that steep slopes are not de-vegetated unnecessarily and subsequently become hydrophobic (i.e., have increased runoff and a decreased infiltration rate) increasing the erosion potential.
- » Soil loss is related to the length of time that soils are exposed prior to rehabilitation or stabilisation. Therefore, the timeframe between construction activities and rehabilitation should be minimised. Phased construction and progressive rehabilitation, where practically possible, are therefore important elements of the erosion control and rehabilitation strategy.
- » Any areas showing erosion, should be adaptively managed with particular erosion control measures, depending on the extent of the erosion.

If the current state of the environment prior to construction (which will be disturbed during the construction phase) is not achieved post impact, within the specified rehabilitation period, maintenance of these areas must continue until an acceptable state is achieved (excluding alien plant species or weeds). Additional rehabilitation methods may be necessary to achieve the current state before construction commenced.

Monitoring of the rehabilitation success, as well as follow-up adaptive management, combined with the clearing of emerging alien plant species should all continue for as long as is considered necessary, depending on regrowth rates.

Appendix 8 - Plant Rescue and Protection Plan

PLANT RESCUE AND PROTECTION PLAN

1. PURPOSE

The purpose of the Search and Rescue and Protection Plan is to implement avoidance and mitigation measures, in addition to the mitigations included in the Environmental Management Programme (EMPr) to reduce the impact of the establishment of the Harmony Joel Solar PV Energy Facility on listed and protected plant species and their habitats during construction and operation. This subplan is required in order to ensure compliance with national and provincial legislation for vegetation clearing and any required destruction or translocation of provincially and nationally protected species within the development area and grid connection corridor.

The Plan first provides some legislative background on the regulations relevant to listed and protected species, under the Threatened or Protected Species (TOPS) Regulations, the Free State Nature Conservation Ordinance 8 of 1969, and trees protected under the National Forests Act: List of Protected Tree Species. This is followed by an identification of protected species present within the development area and actions that should be implemented to minimise impact on these species and comply with legislative requirements.

2. IDENTIFICATION OF SPECIES OF CONSERVATION CONCERN

Plant species are protected at the national level as well as the provincial level and different permits may be required for different species depending on their protection level. At the national level, protected trees are listed by the Department of Forestry, Fisheries and the Environment (DFFE) under the National Forests Act: List of Protected Trees, which is updated on a regular basis. Any clearing of nationally protected trees requires a permit from DFFE. At the provincial level, all species red-listed under the Red List of South African plants (<http://redlist.sanbi.org/>) as well as species listed under the Free State Nature Conservation Ordinance 8 of 1969 are protected and require provincial permits. The Free State Nature Conservation Ordinance 8 of 1969 lists a variety of species as protected but also several whole families and genera as protected.

3. IDENTIFICATION OF LISTED SPECIES

There were three species identified as protected

Where the protected geophytic species, *Boophone distichia* and *Eucomis autumnalis* will be affected by the development, permits will have to be obtained and affected plants transplanted to adjacent areas where they will remain unaffected. A few small specimens of the protected Wild Olive Tree (*Olea europaea susp. africana*) also occur on the site and permits will also have to be obtained to remove these.

A Terrestrial Ecology and Wetland Impact Assessment has been undertaken as part of the EIA Process (refer to **Appendix D** of the BA Report). The assessment did not identify any red data plant species listed under the Red List of South African plants (SANBI, 2017) which occur frequently within the development area and grid connection corridor.

4. MITIGATION & AVOIDANCE OPTIONS

The primary mitigation and avoidance measure that must be implemented at the pre-construction phase is the pre-construction walk-through of the development area and grid connection corridor. This defines which and how many individuals of listed and protected species are found within the development area and grid

connection corridor. This information is required for the permits which must be obtained before construction can commence.

Where listed species fall within the development area and grid connection corridor and avoidance is not possible, then it may be possible to translocate the affected individuals outside of the development area and grid connection corridor. However, not all species are suitable for translocation as only certain types of plants are able to survive the disturbance. Suitable candidates for translocation include most geophytes and succulents. Although there are exceptions, the majority of woody species do not survive translocation well and it is generally not recommended to try and attempt to translocate such species. Recommendations in this regard would be made following the walk-through of the development area and grid connection corridor before construction, where all listed and protected species within the development area and grid connection corridor will be identified and located.

5. RESCUE AND PROTECTION PLAN

5.1. Pre-construction

- » Identification of all listed species which may occur within the development area and grid connection corridor, based on the South African National Biodiversity Institute (SANBI) POSA database as well as the specialist study for the development area and grid connection corridor and any other relevant literature.
- » Before construction commences at the development area and grid connection corridor, the following actions should be taken:
 - A walk-through of the development area and grid connection corridor by a suitably qualified botanist/ecologist to locate and identify all listed and protected species that fall within the project area. This should happen during the flowering season at the development area and grid connection corridor which, depending on rainfall, is likely to be during spring to early summer (August-October).
 - A walk-through report following the walk-through which identifies areas where minor deviations to roads and other infrastructure can be made to avoid sensitive areas and important populations of listed species must be compiled. The report should also contain a full list of localities where listed species occur within the development area and grid connection corridor and the number of affected individuals in each instance so that this information can be used to comply with the permit conditions required by the relevant legislation. Those species suitable for search and rescue should be identified in the walk-through report.
 - A permit to clear the site and relocate species of concern is required from the Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs (FSDESTEA) before construction commences. A tree clearing permit is also required from DFFE to clear protected trees from the site.
 - Once the permits have been issued, there should be a search and rescue operation of all listed species that cannot be avoided, which have been identified in the walk-through report as being suitable for search and rescue within the development area and grid connection corridor. Affected individuals should be translocated to a similar habitat outside of the development area and grid connection corridor and marked for monitoring purposes.

5.2. Construction

- » Vegetation clearing should take place in a phased manner so that large cleared areas are not left standing with no activity for long periods of time and pose a wind and water erosion risk. This will require

coordination between the contractor and Environmental Officer (EO), to ensure that the EO is able to monitor activities appropriately.

- » All cleared material should be handled according to the Revegetation and Rehabilitation Plan and used to encourage the recovery of disturbed areas.
- » The EO should monitor vegetation clearing at the development area and grid connection corridor. Any deviations from the plans that may be required should first be checked for listed species by the EO and any listed species present which are able to survive translocation should be translocated to a safe site.
- » All areas to be cleared should be demarcated with construction tape, survey markers or similar. All construction vehicles should work only within the designated area.
- » Plants suitable for translocation or for use in the rehabilitation of already cleared areas should be identified and relocated before general clearing takes place.
- » Any listed species observed within the development area and grid connection corridor that were missed during the pre-construction plant sweeps should be translocated to a safe site before clearing commences.
- » Many listed species are also sought after for traditional medicine or by collectors and so the EO and Environmental Control Officer (ECO) should ensure that all staff attend environmental induction training in which the legal and conservation aspects of harvesting plants from the wild are discussed.
- » The EO should monitor construction activities in sensitive habitats such as in dune areas carefully to ensure that impacts to these areas are minimised.

5.3. Operation

- » Access to the development area should be strictly controlled and all personnel entering or leaving the development area should be required to sign in and out with the security officers.
- » The collecting of plants or their parts should be strictly forbidden and signs stating so should be placed at the entrance gates to the development area.

6. MONITORING & REPORTING REQUIREMENTS

The following reporting and monitoring requirements are recommended as part of the plant rescue and protection plan:

- » Pre-construction walk-through report detailing the location and distribution of all listed and protected species must be compiled. This should include a walk-through of all infrastructure including all new access roads, cables, buildings and substations. The report should include recommendations of route adjustments where necessary, as well as provide a full account of how many individuals of each listed species will be impacted by the development. Details of plants suitable for search and rescue must also be included.
- » Permit applications to FSDESTEA and DFFE. This requires the walk-through report as well as the identification and quantification of all listed and protected species within the development area. The permit is required before any search and rescue or vegetation clearance can take place. Where large numbers of listed species are affected, a site inspection and additional requirements may be imposed by FSDESTEA and DFFE as part of the permit conditions. All documentation associated with this process needs to be retained and the final clearing permit should be kept at the development area.
- » Active daily monitoring of clearing during construction by the EO must be undertaken to ensure that listed species and sensitive habitats are avoided. All incidents should be recorded along with the remedial measures implemented.
- » Post-construction monitoring of plants translocated during search and rescue to evaluate the success of the intervention. Monitoring for a year post-transplant should be sufficient to gauge success.

Appendix 9 - Traffic and Transportation Management Plan

TRAFFIC AND TRANSPORTATION GUIDING PRINCIPLES

1. PURPOSE

The purpose of this Traffic and Transportation Management Guide is to address regulatory compliance, traffic management practices, and protection measures to help reduce impacts related to transportation and the construction of temporary and long-term access within the vicinity of the Harmony Joel Solar PV Facility development area. The objectives of these guiding principles include the following:

- » To ensure compliance with all legislation regulating traffic and transportation within South Africa (National, Provincial, Local & associated guidelines).
- » To avoid incidents and accidents while vehicles are being driven and while transporting personnel, materials, and equipment to and from the project area.
- » To raise greater safety awareness in each driver and to ensure the compliance of all safe driving provisions for all the vehicles.
- » To raise awareness to ensure drivers respect and follow traffic regulations.
- » To avoid the deterioration of access roads and the pollution that can be created due to noise and emissions produced by equipment, machinery, and vehicles.

2. TRAFFIC AND TRANSPORTATION MANAGEMENT PRINCIPLES

- » Prior to the commencement of construction, the contractor must develop a detailed Transport Management Plan (TMP) based on relevant traffic volumes and road carry capacity.
- » The transport contractor must ensure that all required permits for the transportation of abnormal loads are in place prior to the transportation of equipment and project components to the project area. Specific abnormal load routes must be developed with environmental factors taken into consideration.
- » Before construction commences, authorised access routes must be clearly marked in the field with signs or flagging. The Construction Contractor must review the location of designated access and will be responsible for ensuring construction travel is limited to designated routes.
- » All employees must attend an environmental training program (e.g., toolbox talks) by the Environmental Officer (EO). Through this program, employees will be instructed to use only approved access roads, drive within the delineated road limits, and obey jurisdictional and posted speed limits to minimise potential impacts to the environment and other road users.
- » The contractor will be responsible for making sure that their suppliers, vendors, and subcontractors strictly comply with the principles of this TMP and the contractor's TMP.
- » Adjacent landowners must be notified of the construction schedule.
- » Access roads and entrances to the site should be carefully planned to limit any intrusion on the neighbouring property owners and road users.
- » Signs must be posted in the project area to notify landowners and others of the construction activity.
- » Flagging must be provided at access points to the site and must be maintained until construction is completed on the site.
- » Speed limits must be established prior to commencement of construction and enforced over all construction traffic.
- » Speed controls and implementation of appropriate dust suppression measures must be enforced to minimise dust pollution.

- » Throughout construction, the contractor will be responsible for monitoring the condition of roads used by project traffic and for ensuring that roads are maintained in a condition that is comparable to the condition they were in before the construction began.
- » Drivers must have an appropriate valid driver's license and other operation licences required by applicable legislation.
- » All vehicles must be maintained in good mechanical, electrical, and electronic condition, including but not limited to the brake systems, steering, tires, windshield wipers, side mirrors and rear-view mirror, safety belts, signal indicators, and lenses.
- » Any traffic delays attributable to construction traffic must be co-ordinated with the appropriate authorities.
- » No deviation from approved transportation routes must be allowed unless roads are closed for reasons outside the control of the contractor.
- » Impacts on local communities must be minimised. Consideration where possible should be given to limiting construction vehicles travelling on public roadways during the morning and late afternoon commute time.

3. MONITORING

- » The principal contractor must ensure that all vehicles adhere to the speed limits.
- » A speeding register must be kept with details of the offending driver.
- » Repeat offenders must be penalised.
- » Where traffic signs are not being adhered to, engineering structures must be used to ensure speeds are reduced.

Appendix 10 - Stormwater and Erosion Management Plan

STORMWATER MANAGEMENT GUIDE

1. PURPOSE

By taking greater cognisance of natural hydrological patterns and processes, it is possible to develop storm water management systems in a manner that reduces these potentially negative impacts and mimic nature. The main risks associated with inappropriate storm water management are increased erosion risk and risks associated with flooding. Therefore, this Stormwater Management Guide and the Erosion Management Plan are closely linked to one another and should be managed together.

This Stormwater Management Guide addresses the management of stormwater runoff from the development area and significant impacts relating to resultant impacts such as soil erosion and downstream sedimentation. The main factors influencing the planning of stormwater management measures and infrastructure are:

- » Topography and slope gradients.
- » Placing of infrastructure and infrastructure design.
- » Annual average rainfall.
- » Rainfall intensities.

The objective of these guiding principles is therefore to provide measures to address runoff from disturbed portions of the development area, such that they:

- » Do not result in concentrated flows into natural watercourses i.e., provision should be made for temporary or permanent measures that allow for attenuation, control of velocities and capturing of sediment upstream of natural watercourses.
- » Do not result in any necessity for concrete or other lining of natural watercourses to protect them from concentrated flows off the development if not necessary.
- » Do not divert flows out of their natural flow pathways, thus depriving downstream watercourses of water.

This Stormwater Management Guide must be updated and refined once the construction/ civil engineering plans have been finalised following detailed design.

2. RELEVANT ASPECTS OF THE SITE

The proposed development is located on a terrain unit of rolling or irregular plains with low hills at an altitude of between 1,370 and 1,410 meters. During the pre-mining period the land on which the mine is now situated was used for agricultural purpose and mainly for cultivation of crops and grazing purposes.

Wetlands and Freshwater Resources

The surface water features of the study area are dominated by the Doring River which is situated adjacent to the site along its eastern, northern and western borders and may in some areas occur in close proximity to it. Associated with the Doring River is an extensive floodplain which may also extend onto the site. This is also dependent on the 1:100 year floodline of this watercourse. Within this floodplain an area of temporary saturation has also been identified which forms part of a floodplain wetland area although observed wetland conditions are only of a temporary nature and this area is therefore not clearly defined. The river

itself is a tributary of the Sand River and is therefore a smaller system though still significant. It is regarded as perennial or nearly so, flowing for the most part of the year. The river also drains a large catchment which seems to be largely natural and the river should therefore be in a quite good condition, however, immediate upstream gold mining operations does seem to significantly contribute toward poor water quality which is likely to have a significant affect on it.

The vegetation survey indicated that obligate wetland vegetation occurs along the banks of the Doring River but does not extend into the floodplain. The floodplain of the river is dominated by alluvial clays which, although they do not contain wetland conditions, are clearly a consequence of alluvial deposition after flooding and which confirms the presence of an extensive floodplain. However, a portion in the north eastern corner of the study area contains a grassy floodplain where Facultative Wetland grasses dominate and which therefore indicates a temporary wetland zone. This was also confirmed by soil samples which confirmed temporary soil saturation.

3. STORMWATER MANAGEMENT PRINCIPLES

In the design phase, various stormwater management principles should be considered including:

- » Prevent concentration of stormwater flow at any point where the ground is susceptible to erosion.
- » Reduce stormwater flows as far as possible by the effective use of attenuating devices (such as swales, berms, and silt fences). As construction progresses, the stormwater control measures are to be monitored and adjusted to ensure complete erosion and pollution control at all times.
- » Silt traps must be used where there is a danger of topsoil or material stockpiles eroding and entering streams and other sensitive areas.
- » Construction of gabions and other stabilisation features on steep slopes may be undertaken to prevent erosion, if deemed necessary.
- » Minimise the area of exposed bare soils to minimise the erosive forces of wind, water and all forms of traffic.
- » Ensure that development does not increase the rate of stormwater flow above that which the natural ground can safely accommodate at any point in the sub-catchments.
- » Ensure that all stormwater control works are constructed in a safe and aesthetic manner in keeping with the overall development.
- » Plan and construct stormwater management systems to remove contaminants before they pollute surface waters or groundwater resources.
- » Contain soil erosion, whether induced by wind or water forces, by constructing protective works to trap sediment at appropriate locations. This applies particularly during construction.
- » Avoid situations where natural or artificial slopes may become saturated and unstable, both during and after the construction process.
- » Design and construct roads to avoid concentration of flow along and off the road. Where flow concentration is unavoidable, measures to incorporate the road into the pre-development stormwater flow should not exceed the capacity of the culvert. To assist with the stormwater run-off, gravel roads should typically be graded and shaped with a 2-3% cross fall back into the slope, allowing stormwater to be channelled in a controlled manner towards the natural drainage lines and to assist with any sheet flow on the project area.
- » Design culvert inlet structures to ensure that the capacity of the culvert does not exceed the pre-development stormwater flow at that point. Provide detention storage on the road and/or upstream of the stormwater culvert.
- » Design outlet culvert structures to dissipate flow energy. Any unlined downstream channel must be adequately protected against soil erosion.

- » Where the construction of a building causes a change in the vegetative cover of the site that might result in soil erosion, the risk of soil erosion by stormwater must be minimised by the provision of appropriate artificial soil stabilisation mechanisms or re-vegetation of the area. Any inlet to a piped system should be fitted with a screen or grating to prevent debris and refuse from entering the stormwater system.
- » Preferably all drainage channels on the project area and contained within the larger area of the property (i.e., including buffer zone) should remain in the natural state so that the existing hydrology is not disturbed.

3.1. Engineering Specifications

Detailed engineering specifications for a Stormwater Management Plan describing and illustrating the proposed stormwater control measures must be prepared by the Civil Engineers during the detailed design phase and should be based on the underlying principles of this Stormwater Management Guide. This should include erosion control measures. Requirements for project design include:

- » Erosion control measures to be implemented before and during the construction period, including the final stormwater control measures (post construction) must be indicated within the Final/Updated Stormwater Management Plan.
- » All temporary and permanent water management structures or stabilisation methods must be indicated within the Final/Updated Stormwater Management Plan.
- » The drainage system for the project area should be designed to specifications that can adequately deal with a 1:50 year intensity rainfall event or more to ensure sufficient capacity for carrying stormwater around and away from infrastructure.
- » Procedures for stormwater flow through a project area need to take into consideration both normal operating practice and special circumstances. Special circumstances in this case typically include severe rainfall events.
- » An on-site Engineer or Environmental Officer (EO) is to be responsible for ensuring implementation of the erosion control measures on site during the construction period.
- » The Engineering, Procurement and Construction (EPC) Contractor holds ultimate responsibility for remedial action in the event that the approved stormwater plan is not correctly or appropriately implemented and damage to the environment is caused.

During the construction phase, the contractor must prepare a Stormwater Control Method Statement to ensure that all construction methods adopted on the project area do not cause, or precipitate soil erosion and shall take adequate steps to ensure that the requirements of the Stormwater Management Plan are met before, during and after construction. The designated responsible person on the project area, must be indicated in the Stormwater Control Method Statement and shall ensure that no construction work takes place before the relevant stormwater control measures are in place.

An operation phase Stormwater Management Plan should be designed and implemented if not already addressed by the mitigations implemented as part of construction, with a view to preventing the passage of concentrated flows off hardened surfaces and onto natural areas.

PRINCIPLES FOR EROSION MANAGEMENT

1. PURPOSE

Exposed and unprotected soils are the main cause of erosion in most situations. Therefore, this Erosion Management Plan, the Storm water Management Plan and the Revegetation and Habitat Rehabilitation Plan are closely linked to one another and should not operate independently but should rather be seen as complementary activities within the broader environmental management of the site and should therefore be managed together.

This Erosion Management Plan addresses the management and mitigation of potential impacts relating to soil erosion. The objective of the plan is to provide:

- » A general framework for soil erosion and sediment control, which enables the contractor to identify areas where erosion can occur and is likely to be accelerated by construction related activities.
- » An outline of general methods to monitor, manage and rehabilitate erosion prone areas, ensuring that all erosion resulting from all phases of the development is addressed.

This plan must be updated and refined once the construction/ civil engineering plans have been finalised following detailed design.

2. RELEVANT ASPECTS OF THE SITE

The Free State Province is located on the Highveld, a plateau rising to elevations of 1800m in the east and sloping to about 1200m in the west. The Harmony Joel Solar PV site has an elevation of approximately 1390m. The topography is characterised by slightly undulating plains with wetlands and / or drainage channels bisecting the area. There are some areas in which the topography is relatively flat with little to no tall vegetation.

Soil erosion is a frequent risk associated with solar facilities on account of the vegetation clearing and disturbance associated with the construction phase of the development and may continue occurring throughout the operation phase. All areas where vegetation is removed from the soil surface in preparation for the infrastructure construction will result in exposed soil surfaces that will be prone to erosion. Both wind and water erosion are a risk, as the development area falls within a region that is characterised by a mean annual precipitation that reaches approximately 560mm.

During the operation phase, the areas where vegetation was cleared will remain at risk of soil erosion, especially during a rainfall event when runoff from the cleared surfaces will increase the risk of soil erosion in the areas directly surrounding the project area.

3. EROSION AND SEDIMENT CONTROL PRINCIPLES

The goals of erosion control during and after construction at the project area should be to:

- » Protect the land surface from erosion.
- » Intercept and safely direct run-off water from undisturbed upslope areas through the site without allowing it to cause erosion within the site or become contaminated with sediment.
- » Progressively revegetate or stabilise disturbed areas.

These goals can be achieved by applying the management practices outlined in the following sections.

3.1. On-Site Erosion Management

General factors to consider regarding erosion risk at the project area include the following:

- » Reduction of a stable vegetation cover and associated below-ground biomass that currently increases soil surface porosity, water infiltration rates and thus improves the soil moisture availability. Without the vegetation, the soil will be prone to extensive surface capping, leading to accelerated erosion and further loss of organic material and soil seed reserves from the local environment.
- » Soil loss is related to the length of time that soils are exposed prior to rehabilitation or stabilisation. Therefore, the gap between construction activities and rehabilitation should be minimised. Phased construction and progressive rehabilitation, where practically possible, are therefore important elements of the erosion control strategy.
- » The extent of disturbance will influence the risk and consequences of erosion. Therefore, site clearing should be restricted to areas required for construction purposes only. As far as possible, large areas should not be cleared all at once, especially in areas where the risk of erosion is higher.
- » Roads should be planned and constructed in a manner which minimises their erosion potential. Roads should therefore follow the natural contour as far as possible. Roads parallel to the slope direction should be avoided as far as possible.
- » Where necessary, new roads constructed should include water diversion structures with energy dissipation features present to slow and disperse the water into the receiving area.
- » Roads used for project-related activities and other disturbed areas should be regularly monitored for erosion. Any erosion problems recorded should be rectified as soon as possible and monitored thereafter to ensure that they do not re-occur.
- » Runoff may have to be specifically channelled or storm water adequately controlled to prevent localised rill and gully erosion.
- » Compacted areas should have adequate drainage systems to avoid pooling and surface flow. Heavy machinery should not compact those areas which are not intended to be compacted as this will result in compacted hydrophobic, water repellent soils which increase the erosion potential of the area. Where compaction does occur, the areas should be ripped.
- » All bare areas should be revegetated with appropriate locally occurring species, to bind the soil and limit erosion potential.
- » Silt fences should be used where there is a danger of topsoil or material stockpiles eroding and entering streams and other sensitive areas.
- » Gabions and other stabilisation features must be used on steep slopes and other areas vulnerable to erosion to minimise erosion risk as far as possible.
- » Activity at the project area after large rainfall events when the soils are wet and erosion risk is increased should be reduced. No driving off of hardened roads should occur at any time, and particularly immediately following large rainfall events.
- » Topsoil should be removed and stored in a designated area separately from subsoil and away from construction activities. Topsoil should be reapplied where appropriate as soon as possible in order to encourage and facilitate rapid regeneration of the natural vegetation in cleared areas.
- » Regular monitoring of the project area for erosion problems during construction (on-going) and operation (at least twice annually) is recommended, particularly after large summer thunderstorms have been experienced. The Environmental Control Officer (ECO) will determine the frequency of monitoring based on the severity of the impacts in the erosion prone areas.

3.1.1 Erosion control mechanisms

The contractor may use the following mechanisms (whichever proves more appropriate/ effective) to combat erosion when necessary:

- » Reno mattresses.
- » Slope attenuation.
- » Hessian material.
- » Shade catch nets.
- » Gabion baskets.
- » Silt fences.
- » Storm water channels and catch pits.
- » Soil bindings.
- » Geofabrics.
- » Hydro-seeding and/or re-vegetating.
- » Mulching over cleared areas.
- » Boulders and size varied rocks.
- » Tilling.

3.2 Engineering Specifications

A detailed engineering specifications Storm water Management Plan describing and illustrating the proposed stormwater control measures must be prepared by the Civil Engineers during the detailed design phase and should be based on the underlying principles of the Storm water Management Plan and this should include erosion control measures. Requirements for project design include:

- » Erosion control measures to be implemented before and during the construction period, including the final storm water control measures (post construction).
- » All temporary and permanent water management structures or stabilisation methods must be indicated within the Storm water Management Plan.
- » An on-site Engineer or EO/ Safety, Health and Environment (SHE) Representative to be responsible for ensuring implementation of the erosion control measures on the project area during the construction period. The ECO should monitor the effectiveness of these measures on the interval agreed upon with the Site Manager and EO.
- » The EPC Contractor holds ultimate responsibility for remedial action in the event that the approved Storm water Management Plan is not correctly or appropriately implemented and damage to the environment is caused.

3.3 Monitoring

The project area must be monitored continuously during construction and operation in order to determine any indications of erosion. If any erosion features are recorded as a result of the activities on-site the EO/ SHE Representative (during construction) or Environmental Manager (during operation) must:

- » Assess the significance of the situation.
- » Take photographs of the soil degradation.
- » Determine the cause of the soil erosion.

- » Inform the contractor/operator that rehabilitation must take place and that the contractor/operator is to implement a rehabilitation method statement and management plan to be approved by the Site/Environmental Manager in conjunction with the ECO.
- » Monitor that the contractor/operator is taking action to stop the erosion and assist them where needed.
- » Report and monitor the progress of rehabilitation weekly and record all the findings in a site register (during construction).
- » All actions with regards to the incidents must be reported on a monthly compliance report which should be kept on file for if/when the Competent Authority requests to see it (during construction) and kept on file for consideration during the annual audits (during construction and operation).

The Contractor (in consultation with an appropriate specialist, e.g., an engineer) must:

- » Select a system/mechanism to treat the erosion.
- » Design and implement the appropriate system/mechanism.
- » Monitor the area to ensure that the system functions like it should. If the system fails, the method must be adapted or adjusted to ensure the accelerated erosion is controlled.
- » Continue monitoring until the area has been stabilised.

3 CONCLUSION

The Erosion Management Plan is a document to assist the Proponent/ EPC Contractor with guidelines on how to manage erosion during all phases of the project. The implementation of management measures is not only good practice to ensure minimisation of degradation, but also necessary to ensure compliance with legislative requirements. This document forms part of the Environmental Management Programme (EMPr) and is required to be considered and adhered to during the design, construction, operation, and decommissioning phases of the project (if and where applicable). During the construction phase, the contractor must prepare an Erosion Control Method Statement to ensure that all construction methods adopted on the project area do not cause, or precipitate soil erosion and shall take adequate steps to ensure that the requirements of this plan are met before, during and after construction. The designated responsible person on the project area, must be indicated in the Method Statement and shall ensure that relevant erosion control measures are in place throughout the construction phase.

An operation phase Erosion Management Plan should be designed and implemented if not already addressed by the mitigations implemented as part of construction, with a view to preventing the passage of concentrated flows off hardened surfaces and onto natural areas.

Appendix 11 - Waste Management Plan

WASTE MANAGEMENT PLAN

1. PURPOSE

A Waste Management Plan (WMP) plays a key role in achieving sustainable waste management throughout all phases of the project. The plan prescribes measures for the collection, temporary storage and safe disposal of the various waste streams associated with the project and includes provisions for the recovery, re-use, and recycling of waste. The purpose of this plan is therefore to ensure that effective procedures are implemented for the handling, storage, transportation, and disposal of waste generated from the project activities.

This WMP has been compiled as part of the project Environmental Management Programme (EMPr) and is based on waste stream information available at the time of compilation. Construction and operation activities must be assessed on an ongoing basis in order to determine the efficacy of the plan and whether further revision of the plan is required. This plan should be updated once further detail regarding waste quantities and categorisation become available, during the construction and/or operation stages. This plan should be updated throughout the lifecycle of the Harmony Joel Solar PV Energy Facility, as required, in order to ensure that appropriate measures are in place to manage and control waste and to ensure compliance with relevant legislation.

Prior to the commencement of construction, a detailed Waste Management Method Statement for the project should be compiled by the Contractor.

2. RELEVANT ASPECTS OF THE SITE

It is expected that the development of the Harmony Joel Solar PV Energy Facility will generate construction solid waste, general waste and hazardous waste during the lifetime of the facility.

Waste generated originates from various sources, including but not limited to:

- » Concrete waste generated from spoil and excess concrete.
- » Contaminated water, soil, rocks, and vegetation due to hydrocarbon spills.
- » Hazardous waste from vehicle, equipment and machinery parts and servicing, fluorescent tubes, used hydrocarbon containers, and waste ink cartridges.
- » Recyclable waste in the form of paper, glass, steel, aluminium, wood/ wood pallets, plastic (PET bottles, Polyvinyl chloride (PVC), Low-density polyethylene (LDPE)) and cardboard.
- » Organic waste from food waste as well as alien and endemic vegetation removal.
- » Sewage from portable toilets.
- » Inert waste from spoil material from site clearance and trenching works.

2.1 Panel Cleaning

It is anticipated that the PV panels will be washed four times a year during operation. Only clean water (i.e., with no cleaning products), or non-hazardous biodegradable cleaning products, will be utilised for the washing of panels. Wastewater generated by washing panels will be collected and recycled for future use, or alternatively, in the event that an environmentally friendly non-hazardous biodegradable cleaning product is utilised, wastewater can be allowed to run-off under the panels.

2.2 Effluent and Wastewater

During the construction and operation phases, mobile chemical toilets or a conservancy tank will be placed within the development area for use by contractors. These facilities will be maintained and serviced regularly by an appropriate waste contractor. Any other effluent discharge during construction and operation will be collected in sealed containers/tanks and collected by a registered service provider (i.e., the Local Municipality/Contractor) to be disposed of at an approved facility off-site.

Alternatively, employees may be requested to utilise existing ablution facilities in close proximity to the PV Facility.

2.3 Waste

All waste generated on site will be handled in accordance with the contractor's Waste Management Plan. Solid waste generated during construction will mainly be in the form of construction material, excavated substrate and domestic solid waste. Cardboard waste will be produced from panel packaging, which will be compacted on site prior to removal. Other wastes include rubber caps on panel edges, wooden pallets, and plastic wrapping (all related to the panel packaging). Waste will be disposed of in either waste skips and/or scavenger proof recycling bins (where possible) and temporarily placed in a central location for removal by an appropriate contractor. Where possible, waste will be recycled. Non-recyclable solid construction waste will be temporarily held in skips or other appropriate waste containers to be disposed of at an appropriately licensed landfill site. Any other waste and excess material will be removed once construction is complete and disposed of at a registered waste facility.

During construction, use of the following hazardous substances is anticipated: paint, grease, petrol / diesel for trucks, cranes, bulldozers etc. Limited amounts of transformer oils and chemicals will be used. Dangerous goods required to be stored during construction (e.g., limited quantities of fuel, oil, lubricants etc.) will be stored in compliance with relevant legislation (i.e., stored on covered and bunded areas / bin, and disposed of at a registered hazardous waste site). Hazardous waste will be appropriately stored and disposed of.

3. LEGISLATIVE REQUIREMENTS

Waste in South Africa is currently governed by several regulations, including:

- » National Environmental Management: Waste Act (NEM:WA), 2008 (Act 59 of 2008).
- » National Environmental Management: Waste Amendment Act, 2014 (Act 26 of 2014).
- » The South African Constitution (Act 108 of 1996).
- » Hazardous Substances Act (Act 5 of 1973).
- » Health Act (Act 63 of 1977).
- » Environment Conservation Act (Act 73 of 1989).
- » Occupational Health and Safety Act (Act 85 of 1993).
- » National Water Act (Act 36 of 1998).
- » The National Environmental Management Act (Act 107 of 1998) (as amended).
- » Municipal Structures Act (Act 117 of 1998).
- » Municipal Systems Act (Act 32 of 2000).
- » Mineral and Petroleum Resources Development Act (Act 28 of 2002).
- » Air Quality Act (Act 39 of 2004).

Storage of waste must be conducted in accordance with the National Norms and Standards for the Storage of Waste, published in Government Notice Regulation (GNR) 926.

4. WASTE MANAGEMENT PRINCIPLES

An integrated approach to waste management is needed on site. Such an approach is illustrated in **Figure 1**.

It is important to ensure that waste is managed with the following objectives in mind during all phases of the project:

- » Reducing volumes of waste is the greatest priority.
- » If reduction is not feasible, the maximum amount of waste is to be recycled.
- » Waste that cannot be recycled is to be disposed of in the most environmentally responsible manner.

The Integrated Waste Management Approach to Waste

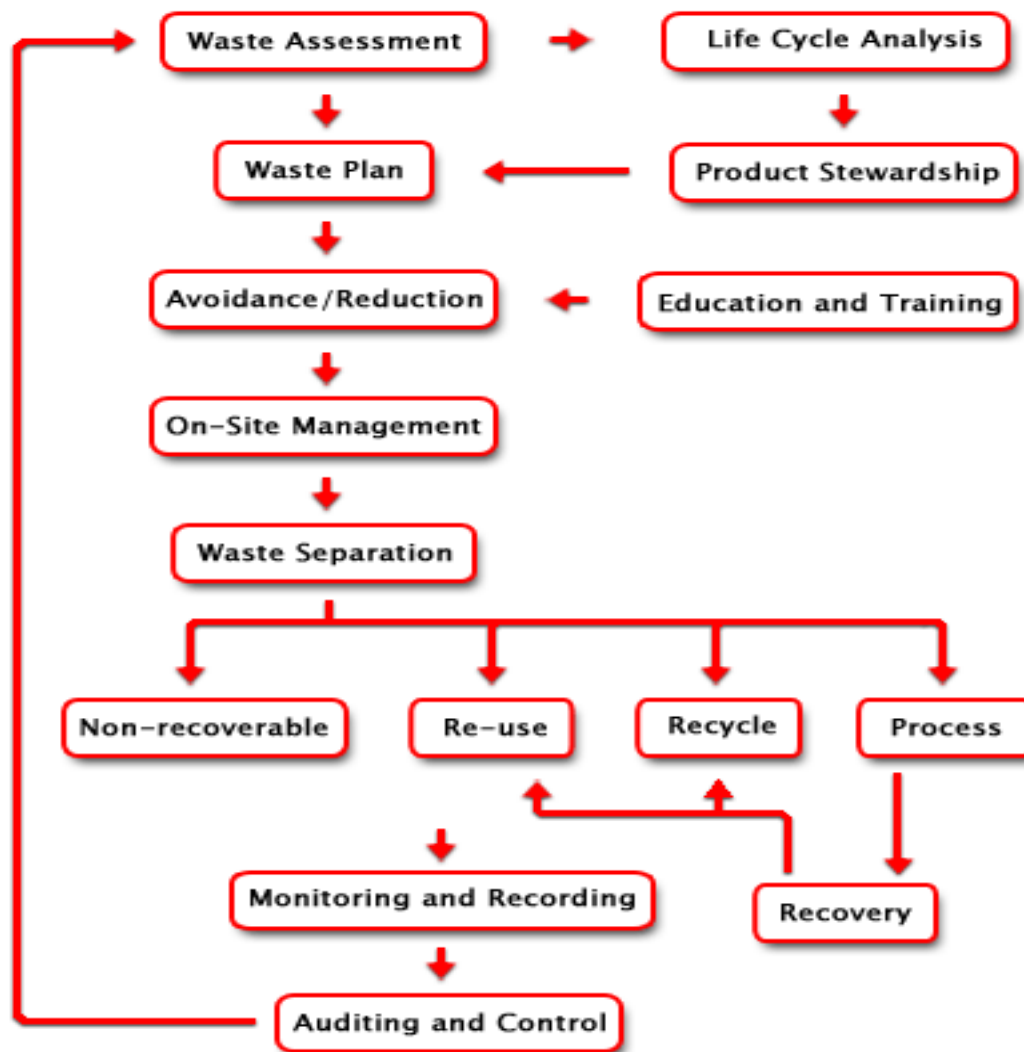


Figure 1: Integrated Waste Management Flow Diagram

(Source: <http://www.enviroserv.co.za/pages/content.asp?SectionId=496>)

4.1. Construction phase

A plan for the management of waste during the construction phase is detailed below. A Method Statement detailing specific waste management practices during construction should be prepared by the Contractor prior to the commencement of construction, for approval by the Resident Engineer.

4.1.1. Waste Assessment / Inventory

- » The Environmental Officer (EO), or designated staff member, must develop, implement, and maintain a waste inventory reflecting all waste generated during construction for both general and hazardous waste streams.
- » Construction methods and materials should be carefully considered in view of waste reduction, re-use, and recycling opportunities, to be pro-actively implemented.
- » Once a waste inventory has been established, targets for the recovery of waste (minimisation, re-use, recycling) should be set.
- » The EO must conduct waste classification and rating in terms of South African National Standard (SANS) 10288 and Government Notice 634 published under the NEM: WA.

4.1.2. Waste collection, handling, and storage

- » It is the responsibility of the EO to ensure that each subcontractor implements their own waste recycling system, i.e., separate bins for food waste, plastics, paper, wood, glass cardboard, metals, etc. Such practises must be made contractually binding upon appointment of the subcontractors.
- » Waste manifests and waste acceptance approvals (i.e., receipts) from designated waste facilities must be kept on file at the site office, in order to record and prove continual compliance for future auditing.
- » Portable toilets must be monitored by the EO or responsible subcontractor and maintained regularly.
- » Waste collection bins and hazardous waste containers must be provided by the principal contractor and subcontractors and placed at strategic locations around the site for the storage of organic, recyclable, and hazardous waste.
- » A dedicated waste area must be established on the project area for the storage of all waste streams before removal from area. The storage period must not trigger listed waste activities as per the NEMWA, GN 921 of November 2013.
- » Signage/ colour coding must be used to differentiate disposal areas for the various waste streams (i.e., paper, cardboard, metals, food waste, glass etc.).
- » Hazardous waste must be stored within a bunded area constructed according to South African Bureau of Standards (SABS) requirements and must ensure complete containment of the spilled material in the event of a breach. As such, appropriate bunding material, design, capacity, and type must be utilised to ensure that no contamination of the surrounding environment will occur despite a containment breach. The net capacity of a bunded compound in a storage facility should be at least 120% of the net capacity of the largest tank.
- » Take into consideration the capacity displaced by other tanks within the same bunded area and any foundations.
- » Treat interconnected tanks as a single tank of equivalent total volume for the purposes of the bund design criteria.
- » The location of all temporary waste storage areas must aim to minimise the potential for impact on the surrounding environment, including prevention of contaminated runoff, seepage, and vermin control, while being reasonably placed in terms of centrality and accessibility on site. Where required, an

additional temporary waste storage area may be designated, provided identical controls are exercised for these locations.

- » Waste storage shall be in accordance with all Regulations and best-practice guidelines and under no circumstances may waste be burnt on site.
- » A dedicated waste management team must be appointed by the principal contractors' Safety, Health and Environment (SHE) Officer, who will be responsible for ensuring the continuous sorting of waste and maintenance of the area. The waste management team must be trained in all areas of waste management and monitored by the SHE Officer.
- » All waste removed from site must be done by a registered/ licensed subcontractor, who must supply information regarding how waste recycling/ disposal will be achieved. The registered subcontractor must provide waste manifests for all removals at least once a month or for every disposal made, records of which must be kept on file at the site camp for the duration of the construction period.

4.1.3. Management of waste storage areas

- » Waste storage must be undertaken in accordance with the relevant Norms and Standards.
- » The position of all waste storage areas must be located so as to ensure minimal degradation to the environment. The main waste storage area must have a suitable storm water system separating clean and contaminated storm water.
- » Collection bins placed around the project area and at subcontractors' camps (if at a different location than the main site camp) must be maintained and emptied on a regular basis by the principal contractor to avoid overflowing receptacles.
- » Inspections and maintenance of the main waste storage area must be undertaken daily. Skips and storage containers must be clearly marked, or colour coded and well-maintained. Monitor for rodents and take corrective action if they become a problem.
- » Waste must be stored in designated containers and not on the ground.
- » Inspections and maintenance of bunds must be undertaken regularly. Bunds must be inspected for leaks or cracks in the foundation and walls.
- » It is assumed that any rainwater collected inside the bund is contaminated and must be treated by oil/water separation (or similar method) prior to dewatering, or removed and stored as hazardous waste, and not released into the environment.
- » If any leaks occur in the bund, these must be amended immediately.
- » Bund systems must be designed to avoid dewatering of contaminated water, but to rather separate oil and hydrocarbons from water prior to dewatering.
- » Following rainfall event bunds must always be dewatered in order to maintain a sufficient storage capacity in the event of a breach.
- » No mixing of hazardous and general waste is allowed.

4.1.4. Disposal

- » Waste generated on the project area must be removed on a regular basis. This frequency may change during construction depending on waste volumes generated at different stages of the construction process, however removal must occur prior to the storage capacity being reached to avoid overflow of containers and poor waste storage.
- » Waste must be removed by a suitably qualified contractor and disposed of at an appropriately licensed landfill site. Proof of appropriate disposal must be provided by the contractor to the EO and Environmental Control Officer (ECO).

4.1.5. Record keeping

The success of the WMP is determined by measuring criteria such as waste volumes, cost recovery from recycling and cost of disposal. Recorded data can indicate the effect of training and education, or the need for education. It will provide trends and benchmarks for setting goals and standards. It will provide clear evidence of the success or otherwise of the plan.

- » Documentation (waste manifest, certificate of issue or safe disposal) must be kept detailing the quantity, nature, and fate of any regulated waste for audit purposes.
- » Waste management must form part of the monthly reporting requirements in terms of volumes generated, types, storage and final disposal.

4.1.6. Training

Training and awareness regarding waste management shall be provided to all employees and contractors as part of the toolbox talks or on-site awareness sessions with the EO and at the frequency as set out by the ECO.

4.2. Operation phase

It is expected that the operation phase will result in the production of limited amounts of general waste consisting mostly of cardboard, paper, plastic, tins, metals and a variety of synthetic compounds. Hazardous wastes (including grease, oils) will also be generated. All waste generated will be required to be temporarily stored at the facility in appropriate sealed containers prior to disposal at a permitted landfill site or other facilities.

The following waste management principles apply during the operation phase:

- » The SHE Manager must develop, implement and maintain a waste inventory reflecting all waste generated during operation for both general and hazardous waste streams.
- » Adequate waste collection bins at site must be supplied. Separate bins should be provided for general and hazardous waste.
- » Recyclable waste must be removed from the waste stream and stored separately.
- » All waste must be stored in appropriate temporary storage containers (separated between different operation wastes and contaminated or wet waste).
- » Waste storage shall be in accordance with all best-practice guidelines and under no circumstances may waste be burnt on site.
- » Waste generated on site must be removed on a regular basis throughout the operation phase.
- » Waste must be removed by a suitably qualified contractor and disposed of at an appropriately licensed landfill site. Proof of appropriate disposal must be provided by the contractor and kept on site.

5. Monitoring of Waste Management Activities

Records must be kept of the volumes/ mass of the different waste streams that are collected from the site throughout the life of the project. The appointed waste contractor is to provide monthly reports to the operator containing the following information:

- » Monthly volumes/ mass of the different waste streams collected.
- » Monthly volumes/ mass of the waste that is disposed of at a landfill site.
- » Monthly volumes/ mass of the waste that is recycled.
- » Data illustrating progress compared to previous months.

This report will aid in monitoring the progress and relevance of the waste management procedures that are in place. If it is found that the implemented procedures are not as effective as required, this WMP is to be reviewed and amended accordingly. This report must form part of the EO's reports to the ECO on a monthly basis.



Appendix 12 - Emergency Preparedness, Response and Fire Management Plan

EMERGENCY PREPAREDNESS, RESPONSE AND FIRE MANAGEMENT PLAN

1. PURPOSE

The purpose of the Emergency Preparedness and Response Plan is:

- » To assist contractor personnel to prepare for and respond quickly and safely to emergency incidents, and to establish a state of readiness which will enable prompt and effective responses to possible events.
- » To control or limit any effect that an emergency or potential emergency may have on site or on neighbouring areas.
- » To facilitate emergency responses and to provide such assistance on the site as is appropriate to the occasion.
- » To ensure communication of all vital information as soon as possible.
- » To facilitate the reorganisation and reconstruction activities so that normal operations can be resumed.
- » To provide for training so that a high level of preparedness can be continually maintained.

This plan outlines response actions for potential incidents of any size. It details response procedures that will minimise potential health and safety hazards, environmental damage, and clean-up efforts. The plan has been prepared to ensure quick access to all the information required in responding to an emergency event. The plan will enable an effective, comprehensive response to prevent injury or damage to the construction personnel, public, and environment during the project. Contractors are expected to comply with all procedures described in this document. A Method Statement should be prepared at the commencement of the construction phase detailing how this plan is to be implemented as well as details of relevant responsible parties for the implementation. The method statement must also reflect conditions of the IFC Performance Standard 1 and include the following:

- » Identification of areas where accidents and emergency situations may occur;
- » Communities and individuals that may be impacted;
- » Response procedure;
- » Provisions of equipment and resources;
- » Designation of responsibilities;
- » Communication; and
- » Periodic training to ensure effective response to potentially affected communities.

2. PROJECT-SPECIFIC DETAILS

Freegold Harmony (Pty) (a subsidiary of Harmony Gold Mining Company Ltd) is looking to supplement its energy supply by implementing photovoltaic (PV) generation at their Mine site, aiding their transition to a more sustainable and environmentally friendly energy mix at the existing Harmony Joel Mine. A solar PV facility with a generating capacity of 18MW is proposed in close proximity to the Harmony Joel mining operations. The site is located 900m north east of the Harmony Joel operations, approximately ~20km north east of the town of Theunissen within the Masilonyana Local Municipality and within the Lejweleputswa District Municipality, Free State Province.

The solar PV facility, known as Harmony Joel Solar PV Facility, will comprise of several arrays of PV panels and associated infrastructure. The project site is located on Portion 0 of the Farm Leeuwbult 580, which are owned by the Mine but outside of the mining area (the project would not impact on mining activities).

A project site considered to be technically suitable for the development of the solar PV facility, with an extent of approximately 1000ha, was identified by Freegold Harmony (Pty) Ltd. A development area of ~220ha was demarcated within the project site for the construction and operation of the Harmony Joel Solar PV Facility and its associated infrastructure, and the full extent of this development area is assessed within this EIA Report. The development area allows an adequate footprint (~47ha) for the installation of a solar PV facility with a contracted capacity of up to 18MW, while allowing for the avoidance of environmental site sensitivities.

The grid connection for the facility will consist of underground cabling within the facility, an on-site facility substation and switching station to be connected to the existing Shafts 1 & 2 HJ Joel Mining Substation via a power line (located ~830m south west of the development footprint). The grid connection infrastructure is located within an assessment corridor of 300m wide and traverses Portion 0 of the Farm Leeuwbult 580.

The project site is proposed to accommodate both the PV facility as well as most of the associated infrastructure which is required for such a facility and will include:

- » PV modules and mounting structures
- » Inverters and transformers a SCADA room, and maintenance room
- » Cabling between the project components, to be laid underground where practical
- » Access roads, internal roads and fencing around the development area.
- » Temporary and permanent laydown areas and O&M buildings.
- » Grid connection solution including an on-site facility substation, switching station, to be connected to the Shafts 1 & 2 HJ Joel Mining Substation via an overhead power line (located ~830m south west of the development footprint).

From a local perspective, the Mine site within the greater Welkom area is considered favourable for the development of a solar energy facility by virtue of prevailing climatic conditions, relief, aspect, the availability of a grid connection, and the availability of land on which the development can take place.

As of 2019, the Industrial sector was the leading electricity consumer in South Africa, with up to 56 percent of the total consumption (Ratshomo 2019). Mining and quarrying accounted for 10% of the industrial consumption (Chamber of Mines of South Africa, 2017). The successful development of the renewable energy project will enable Harmony Gold to make a valuable and meaningful contribution towards growing the green economy within the Free State Province and South Africa. This will assist the Free State in creating green jobs and reducing Green House Gas emissions, while reducing the energy demand on the Eskom national grid.

Due to the scale and nature of this development, it is anticipated that the following risks could potentially arise during the construction and operation phases:

- » Fires.
- » Leakage of hazardous substances.
- » Storage of flammable materials and substances.
- » Flood events.
- » Accidents.

- » Natural disasters.

3. EMERGENCY RESPONSE PLAN

There are three levels of emergency as follows:

- » Local Emergency: An alert confined to a specific locality.
- » Site Emergency: An alert that cannot be localised and which presents danger to other areas within the site boundary or outside the site boundary.
- » Evacuation: An alert when all personnel are required to leave the affected area and assemble in a safe location.

If there is any doubt as to whether any hazardous situation constitutes an emergency, then it must be treated as an Evacuation.

Every effort must be made to control, reduce or stop the cause of any emergency provided it is safe to do so. For example, in the event of a fire, isolate the fuel supply and limit the propagation of the fire by cooling the adjacent areas. Then confine and extinguish the fire (where appropriate) making sure that re-ignition cannot occur.

3.1. Emergency Scenario Contingency Planning

3.1.1. Scenario: Spill which would result in the contamination of land, surface or groundwater

i. Spill Prevention Measures

Preventing spills must be the top priority at all operations which have the potential of endangering the environment. The responsibility to effectively prevent and mitigate any scenario lies with the Contractor and the Environmental Control Officer (ECO). In order to reduce the risk of spills and associated contamination, the following principles should be considered during construction and operation activities:

- » All equipment refuelling, servicing and maintenance activities should only be undertaken within appropriately sealed/contained or bunded designated areas.
- » All maintenance materials, oils, grease, lubricants, etc. should be stored in a designated area in an appropriate storage container.
- » No refuelling, storage, servicing, or maintenance of equipment should take place within sensitive environmental resources in order to reduce the risk of contamination by spills.
- » No refuelling or servicing should be undertaken without absorbent material or drip pans properly placed to contain spilled fuel.
- » Any fluids drained from the machinery during servicing should be collected in leak-proof containers and taken to an appropriate disposal or recycling facility.
- » If these activities result in damage or accumulation of product on the soil, the contaminated soil must be disposed of as hazardous waste. Under no circumstances shall contaminated soil be added to a spoils pile and transported to a regular disposal site.
- » Chemical toilets used during construction must be regularly cleaned. Chemicals used in toilets are also hazardous to the environment and must be controlled. Portable chemical toilets could overflow if not pumped regularly or they could spill if dropped or overturned during moving. Care and due diligence should be taken at all times.

- » Contact details of emergency services and HazMat Response Contractors are to be clearly displayed on the site. All staff are to be made aware of these details and must be familiar with the procedures for notification in the event of an emergency.

ii. Procedures

The following action plan is proposed in the event of a spill:

1. Spill or release identified.
2. Assess person safety, safety of others and environment.
3. Stop the spill if safely possible.
4. Contain the spill to limit entering surrounding areas.
5. Identify the substance spilled.
6. Quantify the spill (under or over guideline/threshold levels).
7. Notify the Site Manager and emergency response crew and authorities (in the event of major spill).
8. Inform users (and downstream users) of the potential risk.
9. Clean up of the spill using spill kit or by HazMat team.
10. Record of the spill incident on company database.

a) Procedures for containing and controlling the spill (i.e. on land or in water)

Measures can be taken to prepare for quick and effective containment of any potential spills. Each contractor must keep sufficient supplies of spill containment equipment at the construction sites, at all times during and after the construction phase. These should include specialised spill kits or spill containment equipment. Other spill containment measures include using drip pans underneath vehicles and equipment every time refuelling, servicing, or maintenance activities are undertaken.

Specific spill containment methods for land and water contamination are outlined below.

Containment of Spills on Land

Spills on land include spills on rock, gravel, soil and/or vegetation. It is important to note that soil is a natural sorbent, and therefore spills on soil are generally less serious than spills on water as contaminated soil can be more easily recovered. It is important that all measures be undertaken to avoid spills reaching open water bodies located outside of the project site. The following methods could be used:

- » *Dykes* - Dykes can be created using soil surrounding a spill on land. These dykes are constructed around the perimeter or down slope of the spilled substance. A dyke needs to be built up to a size that will ensure containment of the maximum quantity of contaminant that may reach it. A plastic tarp can be placed on and at the base of the dyke such that the contaminant can pool up and subsequently be removed with sorbent materials or by pump into barrels or bags. If the spill is migrating very slowly, a dyke may not be necessary, and sorbents can be used to soak up contaminants before they migrate away from the source of the spill.
- » *Trenches* - Trenches can be dug out to contain spills. Spades, pick axes or a front-end loader can be used depending on the size of the trench required. Spilled substances can then be recovered using a pump or sorbent materials.

b) Procedures for transferring, storing, and managing spill related wastes

Used sorbent materials are to be placed in plastic bags for future disposal. All materials mentioned in this section are to be available in the spill kits. Following clean up, any tools or equipment used must be properly washed and decontaminated or replaced if this is not possible.

Spilled substances and materials used for containment must be placed into empty waste oil containers and sealed for proper disposal at an approved disposal facility.

c) Procedures for restoring affected areas

Criteria that may be considered include natural biodegradation of oil, replacement of soil and revegetation. Once a spill of reportable size has been contained, the ECO and the relevant Authority must be consulted to confirm that the appropriate clean up levels are met.

3.1.2. Scenario: Fire (and fire water handling)

i. Action Plan

The following action plan is proposed in the event of a fire:

1. Quantify risk.
2. Assess person safety, safety of others and environment.
3. If safe – attempt to extinguish the fire using appropriate equipment.
4. If not safe to extinguish, contain fire.
5. Notify the Site Manager and emergency response crew and authorities.
6. Inform users of the potential risk of fire.
7. Record the incident on the company database or filing register.

ii. Procedures

Because large scale fires may spread very fast it is most advisable that the employee/contractor not put his/her life in danger in the case of an uncontrolled fire.

Portable firefighting equipment must be provided at strategic locations throughout the site, in line with the Building Code of South Africa and the relevant provincial building code. All emergency equipment including portable fire extinguishers, hose reels and hydrants must be maintained and inspected by a qualified contractor in accordance with the relevant legislation and national standards.

Current evacuation signs and diagrams for the building or site that are compliant to relevant state legislation must be provided in a conspicuous position, on each evacuation route. Contact details for the relevant emergency services should be clearly displayed on site and all employees should be aware of procedures to follow in the case of an emergency.

a) Procedures for initial actions

Persons should not fight the fire if any of the following conditions exist:

- » They have not been trained or instructed in the use of a fire extinguisher.

- » They do not know what is burning.
- » The fire is spreading rapidly.
- » They do not have the proper equipment.
- » They cannot do so without a means of escape.
- » They may inhale toxic smoke.

b) Reporting procedures

In terms of the requirements of National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), the responsible person must, within 14 days of the incident, report to the Director General, provincial head of department and municipality.

- » Report fire immediately to the site manager, who will determine if it is to be reported to the relevant emergency services and authorities.
- » The site manager must have copies of the Report form to be completed.



SUMMARY: RESPONSE PROCEDURE

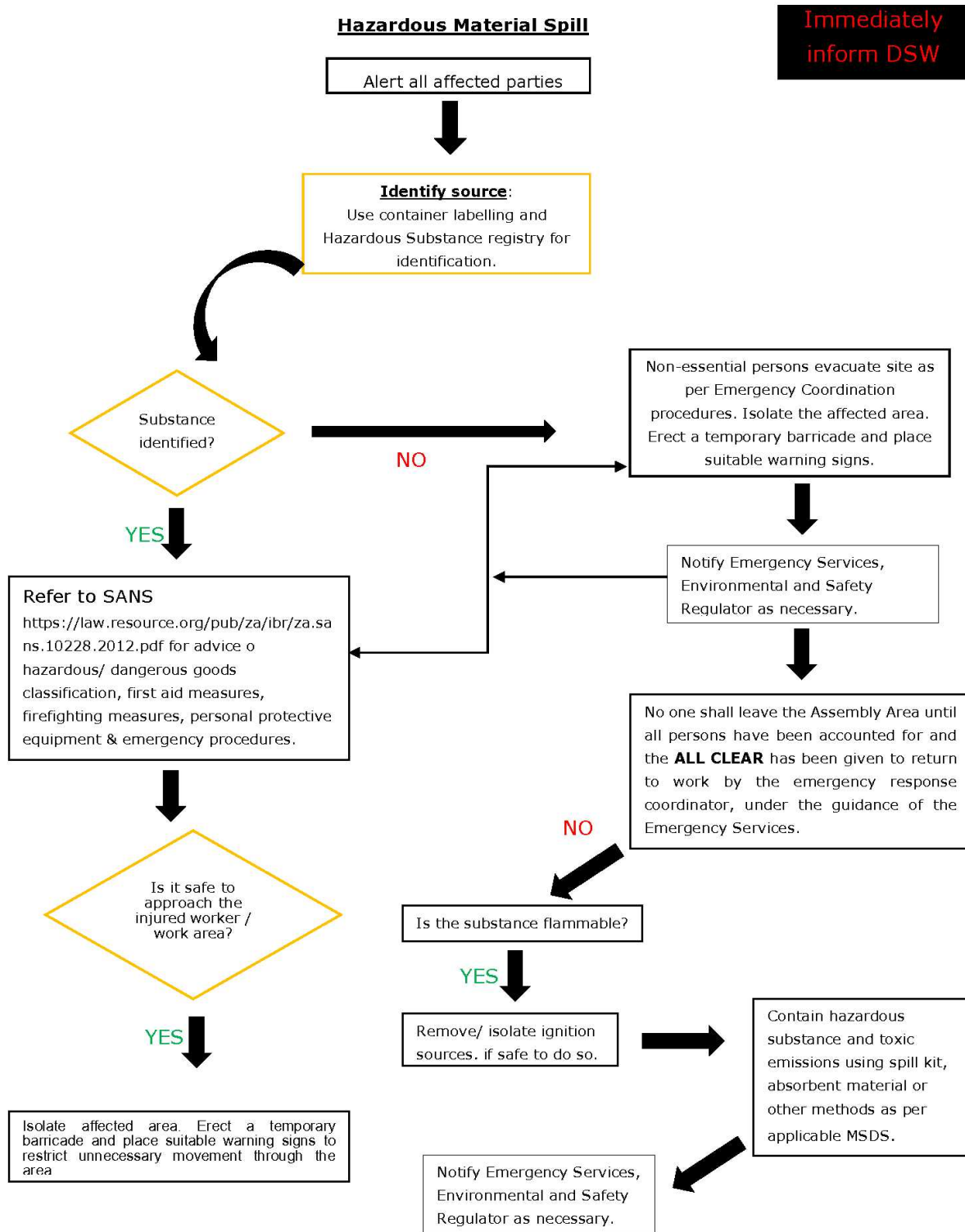


Figure 1: Hazardous Material Spill

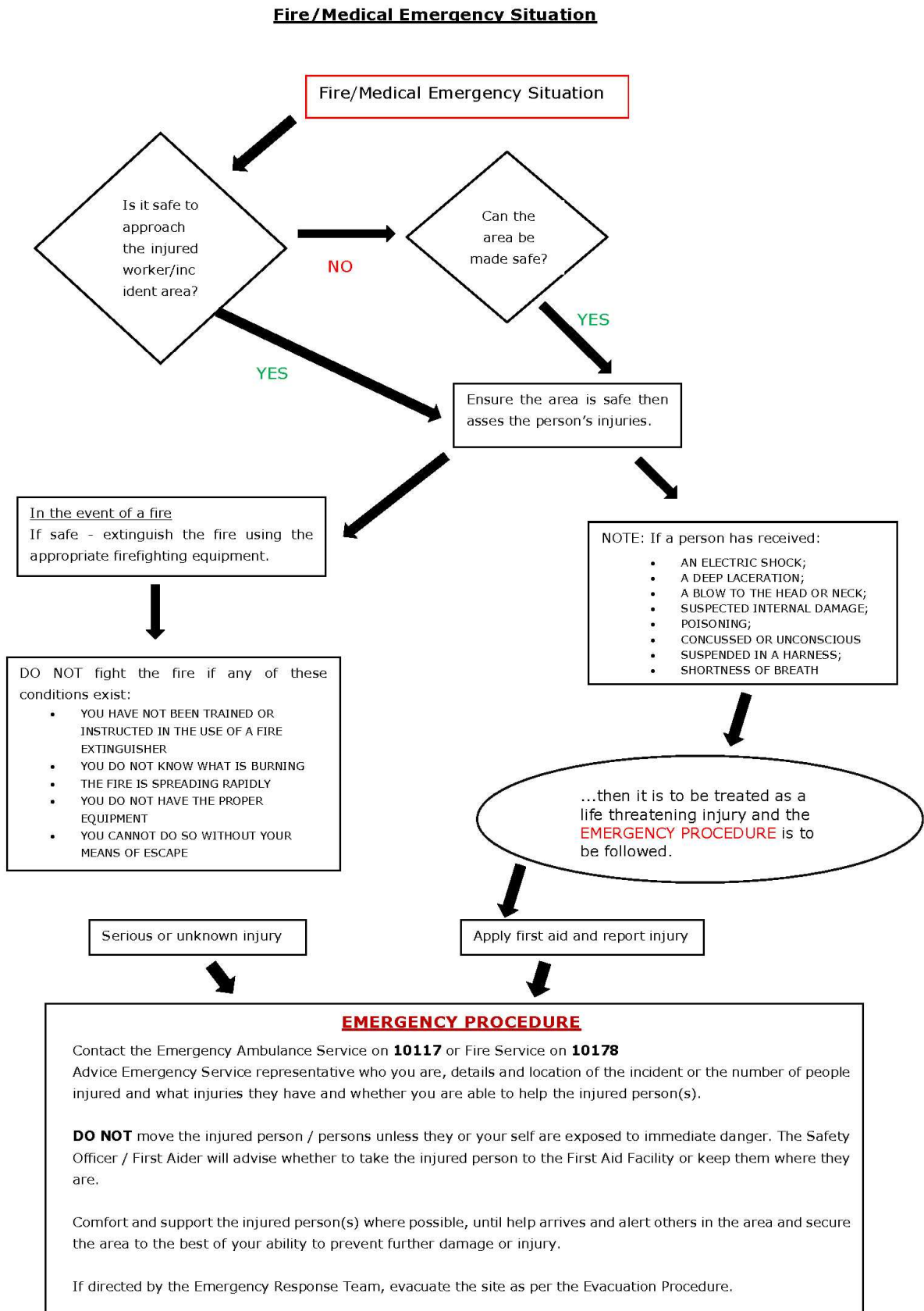


Figure 2: Emergency Fire/Medical

4. PROCEDURE RESPONSIBILITY

The Contractor's Safety, Health and Environment (SHE) Representative, employed by the Contractor, is responsible for managing the day-to-day on-site implementation of this Plan, and for the compilation of regular (usually weekly) Monitoring Reports. In addition, the SHE must act as liaison and advisor on all environmental and related issues.

The local authorities will provide their assistance when deemed necessary, or when it has been requested and/or indicated in Section 30 (8) of NEMA. The provincial authority will provide assistance and guidance where required and conduct awareness programmes.



Appendix 13 - Chance Find Procedure



CHANCE FINDS OF PALAEOLOGICAL MATERIAL

(Adopted from the HWC Chance Fossils Finds Procedure: June 2016)

Introduction

This document is aimed to inform workmen and foremen working on a construction and/or mining site. It describes the procedure to follow in instances of accidental discovery of palaeontological material (please see attached poster with descriptions of palaeontological material) during construction/mining activities. This protocol does not apply to resources already identified under an assessment undertaken under s. 38 of the National Heritage Resources Act (no 25 of 1999).

Fossils are rare and irreplaceable. Fossils tell us about the environmental conditions that existed in a specific geographical area millions of years ago. As heritage resources that inform us of the history of a place, fossils are public property that the State is required to manage and conserve on behalf of all the citizens of South Africa. Fossils are therefore protected by the National Heritage Resources Act and are the property of the State. Ideally, a qualified person should be responsible for the recovery of fossils noticed during construction/mining to ensure that all relevant contextual information is recorded.

Heritage Authorities often rely on workmen and foremen to report finds, and thereby contribute to our knowledge of South Africa's past and contribute to its conservation for future generations.

Training

Workmen and foremen need to be trained in the procedure to follow in instances of accidental discovery of fossil material, in a similar way to the Health and Safety protocol. A brief introduction to the process to follow in the event of possible accidental discovery of fossils should be conducted by the designated Environmental Control Officer (ECO) for the project, or the foreman or site agent in the absence of the ECO. It is recommended that copies of the attached poster and procedure are printed out and displayed at the site office so that workmen may familiarise themselves with them and are thereby prepared in the event that accidental discovery of fossil material takes place.



Actions to be taken

One person in the staff must be identified and appointed as responsible for the implementation of the attached protocol in instances of accidental fossil discovery and must report to the ECO or site agent. If the ECO or site agent is not present on site, then the responsible person on site should follow the protocol correctly in order to not jeopardize the conservation and well-being of the fossil material.

Once a workman notices possible fossil material, he/she should report this to the ECO or site agent. Procedure to follow if it is likely that the material identified is a fossil:

- The ECO or site agent must ensure that all work ceases immediately in the vicinity of the area where the fossil or fossils have been found;
- The ECO or site agent must inform SAHRA of the find immediately. This information must include photographs of the findings and GPS co-ordinates;
- The ECO or site agent must compile a Preliminary Report and fill in the attached Fossil Discoveries: Preliminary Record Form within 24 hours without removing the fossil from its original position. The Preliminary Report records basic information about the find including:
 - The date
 - A description of the discovery
 - A description of the fossil and its context (e.g. position and depth of find)
 - Where and how the find has been stored
 - Photographs to accompany the preliminary report (the more the better):
 - A scale must be used
 - Photos of location from several angles
 - Photos of vertical section should be provided
 - Digital images of hole showing vertical section (side);
 - Digital images of fossil or fossils.

Upon receipt of this Preliminary Report, SAHRA will inform the ECO or site agent whether or not a rescue excavation or rescue collection by a palaeontologist is necessary.



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- Exposed finds must be stabilised where they are unstable and the site capped, e.g. with a plastic sheet or sand bags. This protection should allow for the later excavation of the finds with due scientific care and diligence. SAHRA can advise on the most appropriate method for stabilisation.
- If the find cannot be stabilised, the fossil may be collect with extreme care by the ECO or the site agent and put aside and protected until SAHRA advises on further action. Finds collected in this way must be safely and securely stored in tissue paper and an appropriate box. Care must be taken to remove the all fossil material and any breakage of fossil material must be avoided at all costs.

No work may continue in the vicinity of the find until SAHRA has indicated, in writing, that it is appropriate to proceed.

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| FOSSIL DISCOVERIES: PRELIMINARY RECORDING FORM | | |
|---|---|--------------|
| Name of project: | | |
| Name of fossil location: | | |
| Date of discovery: | | |
| Description of situation in which the fossil was found: | | |
| Description of context in which the fossil was found: | | |
| Description and condition of fossil identified: | | |
| GPS coordinates: | <i>Lat:</i> | <i>Long:</i> |
| If no co-ordinates available then please describe the location: | | |
| Time of discovery: | | |
| Depth of find in hole | | |
| Photographs (tick as appropriate and indicate number of the photograph) | <i>Digital image of vertical section (side)</i> | |
| | <i>Fossil from different angles</i> | |
| | <i>Wider context of the find</i> | |
| Temporary storage (where it is located and how it is conserved) | | |
| Person identifying the fossil Name: | | |
| Contact: | | |
| Recorder Name: | | |
| Contact: | | |
| Photographer Name: | | |
| Contact: | | |

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