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GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE 765KV GAMMA SUBSTATION YARD AND ASSOCIATED INFRASTRUCTURE LOCATED ON PORTION 1 OF FARM UIT VLUGT FONTEIN NO. 265 AND REMAINDER OF FARM SCHIETKUIL NO. 3 IN THE PIXLEY KA SEME AND CENTRAL KAROO DISTRICT MUNICIPALITIES, WESTERN CAPE PROVINCE AND NORTHERN CAPE PROVINCE

JUNE 2023

GENERIC 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 a generic 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 generic EMPr is relevant to an application for EA, that generic 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 a generic 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 generic 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 a generic 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 generic EMPr applies to the development or expansion of substation infrastructure for the transmission and distribution of electricity requiring EA in terms of NEMA. This generic 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 generic EMPr template	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. 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. Where an impact management outcome is not relevant, the words "not applicable" can be inserted in the template under the "responsible persons" column. 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 generic EMPr is gazetted for implementation, it has been approved by the CA. 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.
	2	Site specific information	Contains preliminary infrastructure layout and a declaration that the applicant/holder of the EA

Part	Section	Heading	Content
			will comply with the pre-approved generic EMPr template contained in Part B: Section 1, and 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 impact management actions have been either pre-approved or approved in terms of Part C. 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 Part B: section 2 not be submitted. Once approved, this Section forms part of the EMPr for the development and is legally binding.
C		Site specific sensitivities/ attributes	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 generic 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 (Part B: section 1) This section will not be required should the site contain no specific environmental sensitivities or attributes. However, if Part C 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

Part	Section	Heading	Content
			approved, Part C forms part of the EMPr for the site and is legally binding. 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 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 generic 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 'generic 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	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 generic 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)	<u>Role</u> 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. <u>Responsibilities</u> - 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)	Role The DSS reports directly to the DPM, oversees site works, liaises with the contractor(s) and the ECO. The DSS is responsible for the day to day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMPr. Responsibilities - Ensure that all contractors identify a contractor's Environmental Officer (cEO); - Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM and ECO; - Must ensure that all landowners have the relevant contact details of the site staff, ECO and cEO; - Issuing of site instructions to the Contractor for corrective actions required; - Will issue all non-compliances to contractors; and - Ratify the Monthly Environmental Report.
Environmental Control Officer (ECO)	Role The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. The ECO provides feedback to the DSS and Project Manager regarding all environmental matters. The Contractor, cEO and dEO are answerable to the Environmental Control Officer for non-compliance with the Performance Specifications as set out in the EA and EMPr. 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 variation, not allowed for in the

Responsible Person(s)	Role and Responsibilities
	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. <u>Responsibilities</u> The responsibilities of the ECO will include the following: - Be aware of the findings and conclusions of all EA related to the development; - Be familiar with the recommendations and mitigation measures of this EMPr; - Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them; - Undertake regular and comprehensive site inspections / audits of the construction site according to the generic EMPr and applicable licenses in order to monitor compliance as required; - Educate the construction team about the management measures contained in the EMPr and environmental licenses; - Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective; - Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements; - In consultation with the Developer Site Supervisor order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses; - Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns; - Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr; - Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO); - Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc.) as well as corrective and preventive actions taken; - Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken;

Responsible Person(s)	Role and Responsibilities
	- 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. The ECO will undertake monthly inspections during the pre-construction and construction phases of the activity. Post construction and operation phase audits will be undertaken as per the requirements of the Environmental Authorisation.
developer Environmental Officer (dEO)	<u>Role</u> 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. <u>Responsibilities</u> - Be fully conversant with the EMPr; - Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures; - Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s) ; - Confine the development site to the demarcated area; - Conduct environmental internal audits with regards to EMPr and authorisation compliance (on cEO); - Assist the contractors in addressing environmental challenges on site; - Assist in incident management:

Responsible Person(s)	Role and Responsibilities
	- Reporting environmental incidents to developer and ensuring that corrective action is taken, and lessons learnt shared; - Assist the contractor in investigating environmental incidents and compile investigation reports; - Follow-up on pre-warnings, defects, non-conformance reports; - Measure and communicate environmental performance to the Contractor; - Conduct environmental awareness training on site together with ECO and cEO; - Ensure that the necessary legal permits and / or licenses are in place and up to date; - Acting as Developer's Environmental Representative on site and work together with the ECO and contractor;
Contractor	<u>Role</u> The Contractor appoints the cEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr while performing the onsite activities as per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion of substation infrastructure for the transmission and distribution of electricity activities. <u>Responsibilities</u> - project delivery and quality control for the development services as per appointment; - employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site during the construction period; - ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely; - attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones; - ensure that contractors' staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in EMPr, to the satisfaction of the ECO.

Responsible Person(s)	Role and Responsibilities
contractor Environmental Officer (cEO)	<u>Role</u> Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria: <u>Responsibilities</u> - Be on site throughout the duration of the project and be dedicated to the project; - Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site; - Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr and Method Statements; - Attend the Environmental Site Meeting; - Undertaking corrective actions where non-compliances are registered within the stipulated timeframes; - Report back formally on the completion of corrective actions; - Assist the ECO in maintaining all the site documentation; - Prepare the site inspection reports and corrective action reports for submission to the ECO; - Assist the ECO with the preparing of the monthly report; and - Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint a cEO representing that company.

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 generic and site specific EMPr as well as any amendments thereof;
- Copy of declaration of implementing generic 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 in generic and 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 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 generic EMPr template

5. IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS

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

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

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

5.1 Environmental awareness training

Impact management outcome: All onsite staff are aware and 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	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
– The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum: a) Safety notifications; and	Contractor	Develop and place appropriate	Pre-construction Construction	ECO dEO cEO	Monthly	Photographic record

b) No littering.		posters at key locations				
– Environmental awareness training must include as a minimum the following: a) Description of significant environmental impacts, actual or potential, related to their work activities; b) Mitigation measures to be implemented when carrying out specific activities; c) Emergency preparedness and response procedures; d) Emergency procedures; e) Procedures to be followed when working near or within sensitive areas; f) Wastewater management procedures; g) Water usage and conservation; h) Solid waste management procedures; i) Sanitation procedures; j) Fire prevention; and k) Disease prevention.	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
– 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
– 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	Pre-construction Construction	ECO dEO	Prior to the commencement of the environmental	Environmental awareness training material requirements checklist

		dangers of open and/or unattended fire			awareness training	
– 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 by 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 minimized 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,	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

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;						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 sensitive areas and within previously disturbed areas identified in the BA Report	Pre-construction	ECO dEO	Once, prior to construction	Availability of a layout and 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.	Not applicable – the development of new accommodation is not proposed.					

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 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 formalized 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 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 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 re-habilitated to the pre-disturbance state	Construction and Rehabilitation	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 (and Eskom maintenance staff where relevant to operation)	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	During the construction phase	ECO	Prior to the use of private roads	Photographic record and proof of the road conditions agreed upon

		section 4.9 and agree on the required condition of the roads with the landowner, DPM and contractor				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 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	Pre-construction & Construction	dEO	Monthly	Existing gates are utilised on a frequent basis and only limited

		the existing gates to be used				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 section4.9
– 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 (and Eskom maintenance staff where relevant to operation)	Ensure all relevant gates are fitted with locks and are always locked	Construction and Operation	ECO Operation and maintenance team	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 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 required
– 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	During the construction phase	cEO	Once, during the erection of the gates during	New gates installed as per the requirement

		installed for jackal proofing			the construction phase	
– 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	During the construction phase	ECO	Once during the erection of fencing	Photographic record of fences erected
– Any temporary fencing to restrict the movement of life-stock 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 restrict life-stock 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
– 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	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 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

						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
– 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 / Contractor / dEO / cEO in consultation with the ECO	The onsite borehole must be registered with the DWS prior to commencement of activities	Prior to commencement, during construction and operational phase	ECO / dEO	Registration of borehole once off prior commencement of construction and monitoring of abstraction volumes on a daily basis during construction and during operation.	Proof of registration of borehole from DWS and proof of daily records of abstraction volumes to be attached to monthly audit reports.
– The Contractor must ensure the following: a. The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river; b. No damage occurs to the river bed or banks and that the abstraction of water does not entail stream diversion activities; and	Not applicable - During the construction phase, water will be sourced from boreholes (if groundwater is available and if suitable (with appropriate permits and land owner agreements in place), or might be trucked in from an alternate water supply if needed). At this stage, no water is planned to be abstracted from or discharged to any surface water systems. During the operational phase of the proposed distribution line, water requirements are not applicable.					

– c.All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented.						
– Ensure water conservation is being practiced by: a. Minimising water use during cleaning of equipment; b. Undertaking regular audits of water systems; and c. Including a discussion on water usage and conservation during environmental awareness training. d. The use of grey water is encouraged.	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 wastewater 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
– 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	ECO	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	During the Construction Phase	ECO	Monthly	Availability of approved absorbent material at the construction site

		licensed waste disposal facilities for disposal of oil				and proof of disposal of oil at licenses 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 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.
– 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.	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 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.

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 which are strategically placed throughout the site	During the construction phase	ECO	Weekly	Appropriate waste collection 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	Design and Construction Phase	ECO	Once, prior to the commencement of construction	A waste collection site is appropriately placed and demarcated

		and temporary fencing				
– 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	ECO	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 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 management plan	During the construction phase	ECO	Monthly	Disposal certificates of disposal at licensed facilities to be provided
– 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	ECO	Weekly	No incidents reported of spillage of pollutants into watercourses
– 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	ECO	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	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

		assessment and specialist studies				the authorised layout by reviewing the as-built designs (once-off confirmation).
– No return flow into the estuaries must be allowed and no disturbance of the Estuarine functional Zone should occur;	Not applicable – no estuaries are located within the study area.					
– Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available;	Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available;	cEO, Contractor	Ensure that permeant crossings (access roads) are provided for access to the grid connection corridor if no alternative crossing is available.	During the construction phase	cEO	Weekly
– There must not be any impact on the long-term morphological dynamics of watercourses or estuaries	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 continually monitoring	During the construction and operation phase	ECO, dEO	For all phases of the project life cycle (i.e. construction, operation, decommissioning)
– Existing crossing points must be favored over the creation of new crossings (including temporary access)	DPM, cEO	Develop a management plan or process	During the pre-construction and	ECO, dEO	During the construction	Existing crossing points utilised as opposed to new

		for implementation should a spill take place within a watercourse and ensure continually monitoring	construction phase		phase of the project.	ones created and no incidents reported of spillage of pollutants into watercourses
– When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken: a) Water levels during the period of construction; No altering of the bed, banks, course or characteristics of a watercourse 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; 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 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.	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, Contractor (and Eskom maintenance staff where relevant to operation)	Demarcate areas of indigenous vegetation to be avoided before clearance is undertaken	Construction and operation (i.e. for maintenance purposes)	ECO Operation and maintenance team	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	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	ECO	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

– 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	Permits on file
– 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.
– 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	CA permits on file	Trees felled due to construction must be documented and form part of the Environmental Audit Report;	ECO
– 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	During the Construction Phase	ECO	Monthly	No felled trees, vegetation cuttings and debris are dumped in

		licensed waste disposal facility				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 (and Eskom maintenance staff where relevant to operation)	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
– No herbicides must be used in estuaries	Not applicable - no estuaries are present within the study area					
– 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	Remove all alien invasive vegetation and dispose of the removed vegetation at a licensed waste management facility	During the construction phase	ECO	Monthly, and as and when required	Disposal certificates of disposal at licensed facilities to be provided and filed as part of the filing system

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 required	Written consent provided by the landowner and proof of representation of the

					during the construction phase	landowner during interference
– The breeding sites of raptors and other 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 which 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 (and Eskom maintenance staff where relevant to operation)	Avoid breeding sites and ensure that special care is taken in the presence of nestlings and fledgelings	During the Construction Phase Operation Phase	ECO Operation and maintenance team	Weekly, and as and 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 (and Eskom maintenance staff where relevant to operation)	All mitigation measures recommended by the avifauna specialist must be implemented	During the Construction Phase Operation Phase	ECO Operation and maintenance team	Weekly during construction and monthly during operation	Photographic record of compliance and successful implementation of the 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	During the Construction Phase	ECO	Monthly, and as and when required	No instances of poaching is reported

		Awareness Training and the consequences of not adhering to the requirement. These areas must be demarcated as Access Restricted Areas				
– 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 (and Eskom maintenance staff where	Implement and maintain snake deterrents in areas where snakes are abundant	During the Construction Phase Operation Phase	ECO Operation and maintenance team	Once, during the construction and as and when required. Monthly during operation	Photographic record of the implementation and maintenance of snake deterrents

	relevant to operation)					
– 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: 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	Undertake a Heritage Walk-through Survey Spatially identify and demarcate areas of heritage significance as per 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;	Suitably qualified specialist in consultation with the ECO	Appoint a suitably qualified specialist to carry out the monitoring of excavations for fossils, artefacts and important heritage material	During the Construction Phase	ECO	During the undertaking of excavations of fossils, artefacts and heritage material	Proof of appointment of a suitably qualified specialist and photographic record of required monitoring by the specialist
– 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	Weekly, during the construction phase and 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	ECO	Once, prior to the commencement of construction	Compliance with the Emergency Preparedness,

		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	ECO	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 infrastructure and protective scaffolding;	Contractor	All staff must be easily identifiable and the climbing of infrastructure and scaffolding must 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	ECO	Weekly, and as and when required	No incidents of unstable structures due to high winds is reported

		secure structures vulnerable to high winds				
– 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 which avoid environmental sensitivities	During the Construction Phase	ECO	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 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.	Pre-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; 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	ECO	Weekly	No evidence of non-compliance identified
– A copy of the waste disposal certificates must be maintained.	Contractor	Certificates obtained from the licensed waste disposal facility with the emptying of the	During the Construction Phase	ECO	Monthly, and as and when required	Certificates for waste disposal from the licensed waste disposal facility

		toilets must be kept on file				

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	ECO	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 Contractor (and Eskom maintenance staff where relevant to operation)	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	During the Construction Phase	ECO	Quarterly, and as and when required	Voluntary testing schedules and proof of counselling

		services where required				(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. It is recommended that the project owner to become a member of the Southern Cape Fire Protection Association (SCFPA) and that Forestry: Fire Advisor Paul Gerber (044-302 6920; PaulGe@daff.gov.za) be consulted for	Pre-construction	ECO	Once, prior to the commencement of construction	Emergency Preparedness, Response and Fire Management Plan compiled

		advise under the NVFFA				
– 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 emergency procedures	Pre-construction	ECO	Prior to the commencement of the environmental awareness training	Environmental awareness training material 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). – In the event of a significant spill or leak of hazardous substances (petrol and diesel) during the construction or operational phase, such incident(s) must be reported to all relevant authorities, including the Directorate: Pollution and Chemicals Management, in accordance with section 30(5) of the NEMA, 1998 pertaining to the control of incidents.	Contractor (and Eskom maintenance staff where relevant to operation)	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	Pre-construction & Construction	ECO	Once, prior to the commencement of construction and monthly during the	Photographic proof that hazardous substances are stored in suitable containers as

		suitable containers			construction phase	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 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 the Contractor

		Substance (HCS) control sheet specific to the project				
– 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

		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 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); – Bowsers must have a lock on any permanent tap or valve fitted, and this must be locked when not in use; – Where not possible to use portable bunding, make use of drip trays and uPVC lining that has been set up in such a way as to prevent runoff. – Make sure that any container that is used for transporting fuel is fit for purpose, has a sealed lid, does not leak, and is properly labelled.	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	During the Construction Phase	ECO	Once, during construction	Bunded storage areas are constructed

		per the requirements listed				according to the requirements
– 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 and place relevant signage	During the Construction Phase	ECO cEO	Monthly Weekly	Photographic record of the signage placed must be provided

		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 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
– 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 appropriate areas to be provided by the contractor

– 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. – In the event of a significant spill or leak of hazardous substances (petrol and diesel) during the construction or operational phase, such incident(s) must be reported to all relevant authorities, including the Directorate: Pollution and Chemicals Management, in accordance with section 30(5) of the NEMA, 1998 pertaining to the control of incidents.	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	Contractor	Ensure that a drip tray is available for an	During the Construction Phase	ECO	Monthly	Contractor to provide evidence of drip

prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts;		emergency repairs required				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 and keep an updated register of inspection on site	During the Construction Phase	ECO	Monthly	Register of inspection
– 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	During the Construction Phase	ECO	Monthly	Workshop drainage is managed in accordance

		managed as per the requirements of section 5.7				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	ECO	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	Provide containment facility for the collection of cement laden water	During the Construction Phase	ECO	Weekly	No cement laden water is released into the environment
– Dirty water from the batching plant must be contained to prevent soil and groundwater contamination	Contractor	Provide containment facility for the collection of cement laden water (dirty water)	During the Construction Phase	ECO	Weekly	No cement laden water is released into the environment

– 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	ECO	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	ECO	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 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	During the Construction Phase	ECO	Monthly	Proof of damping (or alternative dust

		or otherwise protected from dust generation				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 the 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 around batching plants as per the requirements listed in section 5.5	During the Construction Phase	ECO	Weekly	Temporary fencing is undertaken in accordance with section 5.5

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	ECO	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	ECO	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 dust plume is present	During the Construction Phase	ECO	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	ECO	Bi-weekly (every second week)	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	ECO	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 (and Eskom maintenance staff where relevant to operation)	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 m² 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	ECO	Weekly	Photographic record of measures being implemented and the results thereof

5.21 Blasting

Impact management outcome: Impact to the environment is minimized 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 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: 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	During the Construction Phase	ECO	Monthly, and as and when required	No complaints registered in this regard. No amplification

		the use of amplification communication. The Western Cape Noise Control Regulations published in Provincial Notice 200/2013 must be abided by.				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
– 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 for 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 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 exchange contact details	Pre-construction	Not Applicable		

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 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	ECO	Bi-monthly (every second month)	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	ECO	Bi-monthly (every second month)	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	Collect and retain topsoil for terracing	During the Construction Phase Rehabilitation	ECO	Weekly	Proof of collection and retaining of topsoil
– Areas to be rehabilitated include terrace embankments and areas outside the high voltage yards;	Contractor	Undertake rehabilitation of terrace embankments and areas outside of the high voltage yard where applicable	During the Construction Phase Rehabilitation	ECO	Weekly	Photographic record of rehabilitation of terrace embankments and areas outside the high voltage yards
– Where required, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled;	Contractor	All disturbed slope areas must be stabilised	Rehabilitation	ECO	Weekly	Disturbed slopes are stabilised sufficiently
– 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	Stabilise slopes as per the design specifications	Pre-construction & Rehabilitation	ECO	Weekly	Slopes are stabilised as per the design specifications
– Rehabilitation of the disturbed areas must be managed in accordance with Section 5.35: Landscaping and rehabilitation;	Contractor	Undertaken rehabilitation of disturbed areas as per the requirements	Rehabilitation	ECO	Weekly	Rehabilitation of disturbed areas is undertaken in-line with the

		listed under section 5.35				requirements of section 5.35
– All excess spoil generated during terracing activities must be disposed of in an appropriate manner and at a recognised landfill site; and	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

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 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	During the Construction Phase	ECO	Monthly	Management of hazardous substances spills from equipment is undertaken in

		as per the requirements of section 5.17				line with the requirements 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	Undertake the batching of cement as per the requirements of section 5.19	During the Construction Phase	ECO	Monthly	Management of batching cement is undertaken in line with the requirements of section 5.19
– Residual solid waste must be disposed of in accordance with Section 5.8: Solid waste and hazardous management.	Contractor	Undertake the disposal of solid waste as per the requirements of section 5.8	During the Construction Phase	ECO	Monthly	The disposal of solid waste is undertaken in line with section 5.8.

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	Manage dust as per the requirements of section5.20	During the Construction Phase	ECO	Weekly	The management of dust is undertaken as per the requirements of section 5.20
– Management of equipment used for installation must be conducted in accordance with Section 5.18: Workshop, equipment maintenance and storage;	Contractor	Undertake the management of equipment for installation 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 of hazardous substances and any associated spills must be conducted in accordance with Section 5.17: Hazardous substances; and	Contractor	Undertake the management of hazardous substances and associated spills as per the requirements of section 5.17	During the Construction Phase	ECO	Monthly	Management of hazardous substances and associated spills is undertaken in line with the requirements of section 5.17
– Residual solid waste must be recycled or disposed of in accordance with Section 5.8: Solid waste and hazardous management.	Contractor	Undertake the recycling or disposal of residual solid waste as per the requirements of section 5.8	During the Construction Phase	ECO	Monthly	The recycling or disposal of residual solid waste is undertaken in line with section 5.8.

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	Inspect areas where construction is being undertaken and remove and appropriately dispose of wasted/unused materials	During the Construction Phase	ECO	Weekly	Contractor to provide proof of inspection and removal of waste/unused materials and the appropriate disposal thereof (i.e. disposal certificates)
– 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	Undertake emergency repairs of equipment as per the requirements of section 5.18 and 5.16	During the Construction Phase	ECO	Weekly	Emergency repairs of equipment is undertaken as per the requirements of section 5.18 and 5.16

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 5.8: Solid waste and hazardous Management;	Contractor	Undertake the recycling or disposal of residual solid waste as per the requirements of section 5.8	During the Construction Phase	ECO	Monthly	The recycling or disposal of residual solid waste is undertaken in line with section 5.8.
– 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 for installation as per the requirements of section 5.18	During the Construction Phase	ECO	Monthly	Management of equipment for installation is undertaken in line with the requirements of section 5.18
– Management of hazardous substances and any associated spills shall be conducted in accordance with Section 5.17: Hazardous substances.	Contractor	Undertake the management of hazardous substances and associated spills as per the requirements of section 5.17	During the Construction Phase	ECO	Monthly	Management of hazardous substances and associated spills 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 the recycling or disposal of residual solid waste as per the requirements of section 5.8	During the Construction Phase	ECO	Monthly	The recycling or disposal of residual solid waste is undertaken in line with 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 communities through consideration of the community needs	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
– 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	Pre-construction & Construction	ECO	Once, prior to the commencement of construction and monthly during the	Conflict resolution is undertaken in line with the requirements of the Grievance

		needs and provides procedures for conflict resolution			construction phase	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 a Grievance Mechanism which 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 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 over-night on the site. This would reduce the risk to local farmers.	Not Applicable - no workers, other than security is proposed to stay on-site overnight.					

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	During the Construction Phase	ECO	Prior to site closure for more than 05 days	Signage placed indicating location of fire extinguishers and service records

		are kept up to date and filed				
– 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 must be provided by the Contractor

		It is recommended that the project owner become a member of the Southern Cape Fire Protection Association (SCFPA) and that Forestry: Fire Advisor Paul Gerber (044-302 6920; PaulGe@daff.gov.za) be consulted under the NVFFA.				
– Structures vulnerable to high winds must be secured;	Contractor	Ensure structures vulnerable to wind is secure prior to site closure	During the Construction Phase	ECO	Prior to site closure for more than 05 days	Structures vulnerable to wind is 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	During the Construction Phase	ECO	Prior to site closure for more than 05 days	Toilets are emptied and

		secured prior to site closure				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

5.34 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	Appropriately store old equipment in a manner which prevents pollution to the environment. This could include the construction of bunded areas	Decommissioning	Eco	Monthly	Photographic record of appropriate storage of old equipment

– Oil containing equipment must be stored to prevent leaking or be stored on drip trays;	Contractor	Appropriately store equipment containing oil through the use of drip trays or other suitable methods	Decommissioning	Eco	Monthly	Photographic record of appropriate storage of equipment containing oil
– All scrap steel must be stacked neatly and any disused and broken insulators must be stored in containers;	Contractor	Ensure all scrap steel is stacked neatly and store disused and broken insulators in appropriate containers	Decommissioning	Eco	Monthly	Photographic record of stacked scrap steel and containers containing broken and disused insulators
– 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	Develop and implement a procedure for the dismantling and transportation of equipment containing pollution causing substances which prevents spillage and pollution of the environment	Decommissioning	Eco	Monthly	Proof from contractor that dismantling and transportation of equipment containing pollution causing substances has been undertaken in an appropriate manner
– The Contractor must also be equipped to contain and clean up any pollution causing spills; and	Contractor	Ensure sufficient spill kits are available for the clean-up of	Decommissioning	Eco	Monthly	Sufficient spill kits are available on site

		pollution causing spills				
– Disposal of unusable material must be at a licensed waste disposal site.	Contractor	Make use of a licensed waste disposal site	Decommissioning	Eco	Monthly	Certificates obtained for the disposal at a licensed waste disposal site

5.35 Landscaping and rehabilitation

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

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed of to a registered waste site;	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	ECO	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	Rehabilitation	ECO	Weekly	All slopes are assessed and contoured as required

		contouring is 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	ECO	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	ECO	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;	Contractor	The upper 10cm of soil which was stripped and stockpiled from the entire area where levelling has been conducted should be re-spread over the disturbed surface during rehabilitation: If no levelling was done on a particular area, it is not necessary to	Rehabilitation	ECO	Weekly	Topsoil is spread evenly

		strip topsoil from that area.				
– Rehabilitation of access roads inside of farmland;	Contractor	Rehabilitation must be undertaken following completion of construction as per section 5.35	Rehabilitation	Project Manager / ECO / cEO	On-going following construction	Evidence as per ECO reporting
– 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	ECO	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	ECO	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	ECO	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	ECO	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	Rehabilitation	ECO	Weekly	Subsoil is ripped before topsoil is placed

		spreading of topsoil				
– 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 the 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	ECO	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	ECO	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	ECO	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;	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

b) Pioneer species are included; c) Species chosen must be indigenous to the area with the seeds used coming from the area; d) Root systems must have a binding effect on the soil; e) The final product must not cause an ecological imbalance in the area						

6 ACCESS TO THE GENERIC EMPr

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

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:

Applicant Name	Eskom Holdings SOC Limited
Contact Person	Ms Martina Phiri
Physical Address	Megawatt Park 1 Maxwell Drive Sunninghill Sandton
Postal Address	P.O. Box 1091 Johannesburg 2000
Telephone	011 800 3550
Fax	086 607 0618
Cell	082 468 2137
Email Address	PhiriM@eskom.co.za

7.1.2. Details and Expertise of Environmental Assessment Practitioner (EAP)

EAP Name	**Arlene Singh**
EAP Qualifications	B.Sc. (Hons.) Environmental Management
Professional Affiliation/Registration	SACNASP EAPASA
Physical Address	Waterfall, Cnr Old Main Road & Maxwell Drive, Johannesburg, 2090
Telephone	N/A
Fax	086 471 4190
Cell	084 277 7074
Email Address	arlene@veersgroup.com

Refer to **Appendix A** of the EMPr for the detailed experience of the EAP and the Project Team.

7.1.3. Project Details

Project Name:

PROPOSED UPDATE TO THE LAYOUT TO THE EXISTING 765kV GAMMA SUBSTATION AND ASSOCIATED POWERLINE TURN-IN INFRASTRUCTURE LOCATED ON PORTION 1 OF FARM UIT VLUGT FONTEIN NO. 265 AND REMAINDER OF FARM SCHIETKUIL NO. 3 IN THE PIXLEY KA SEME AND CENTRAL KAROO DISTRICT MUNICIPALITIES, WESTERN CAPE PROVINCE AND NORTHERN CAPE PROVINCE (DFFE REF: 12/12/20/873)

7.1.4. Project Description for the Gamma Substation

The Environmental Authorisation (EA) (DFFE REF: 12/12/20/873) for the existing Gamma Substation took into consideration the construction of the Gamma Substation as a phased approach as per the EIA undertaken in 2007. Following further Eskom planning related to future demand and upcoming renewable energy facilities set to come online in the near future, Eskom has considered an updated layout of the Gamma Substation to accommodate for the additional capacity. Phase 1 of the Gamma Substation has been constructed and Phase 2 i.e., the construction of the 132kV/400kV substation yard and proposed turn-in of the existing 400kV Droerivier- Hydra 2 Overhead Powerline (OHL) is now proposed to be undertaken in line with EIA (ACER, 2007).

The proposed 132kV/400kV yard and 400kV Overhead Lines (OHL) turn-ins fall within the scope of the current EA. However – based on further technical analysis and design – it has been identified that the layout of the authorised infrastructure will need to be updated to accommodate the updated configuration/layout now proposed to be implemented. The updated layout of the proposed 132kV/400kV substation yards falls within the scope and footprint of what was originally assessed in the original EIA process, however the scope of the assessed powerline corridor for the turn-in of the existing 400kV Droerivier Hydra 2 overhead powerline to the proposed 132Kv/400Kv substation yard as planned had not clearly been assessed in the EIA (ACER, 2007) and is therefore being assessed as part of the Part 2 Amendment Application.

Importantly, the 132kV/400kV yard and 400kV OHL turn-ins are needed to enable the connection of the authorised Umsinde Emoyeni Wind Farm (DFFE Ref: 14/12/16/3/3/2/686), which has been selected as a preferred bidder with a private off-taker and has been registered as a Strategic Integrated Project (SIP).

The existing Gamma Substation and the proposed 132kV substation yard and associated infrastructure includes the following:

- The layout is located on Portion 1 of the Farm Uit Vlugt Fontein No. 265 and bordering Remainder of Farm Schietkuil No.3 and consists of a substation yard with a step-up

voltage of 132kV/400kV, that borders Remainder of Farm Schietkuil No.3 and 400kV turn-in infrastructure.

- In addition, the existing Eskom 400kV overhead powerline that currently bypasses the existing Gamma Substation will be reconfigured to turn-in and turn-out of the new substation yard.

The scope of this Generic EMPr covers the 132kV/400kV Gamma Substation yard with respective coordinates as below;

Centre coordinates	Latitude	Longitude
Gamma Substation Yard	31°40'47.37"S	23°24'44.67"E

Corner coordinates	Orientation	Latitude	Longitude
Gamma Substation Yard Corner Coordinates	Corner 1	31°40'38.75"S	23°24'43.66"E
	Corner 2	31°40'41.78"S	23°24'55.38"E
	Corner 3	31°40'52.58"S	23°24'49.37"E
	Corner 4	31°40'52.88"S	23°24'46.25"E
	Corner 5	31°40'51.41"S	23°24'36.93"E

*Note that as the substation yard is not a perfect square therefore 5 corner co-ordinates have been provided.

7.1.5. Project Location for the 132kV/400kV Gamma Substation yard

Location details of the development of the substation:

Province	Northern Cape & Western Cape
District Municipality	Pixley Ka Seme & Central Karoo District Municipalities
Local Municipality	Beaufort West Local Municipality and Ubuntu Local Municipality
Nearest town(s)	Murraysburg
Affected Properties: Farm name(s), number(s) and portion numbers (on-site substation)	Portion 1 of the Farm Uit Vlugt Fontein No.265 Remainder of Farm Schietkuil No.3
SG 21 Digit Code (s)	C08000000000026500001 C05200000000000300000
Current zoning and land use	Agriculture, Powerline Servitude

7.1.6. Preliminary Technical Specifications of the updated Gamma substation

Infrastructure	Footprint, dimensions and details
Substation Yard Capacity	132kV/400kV
Substation Development Footprint	10,5 ha

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. 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.

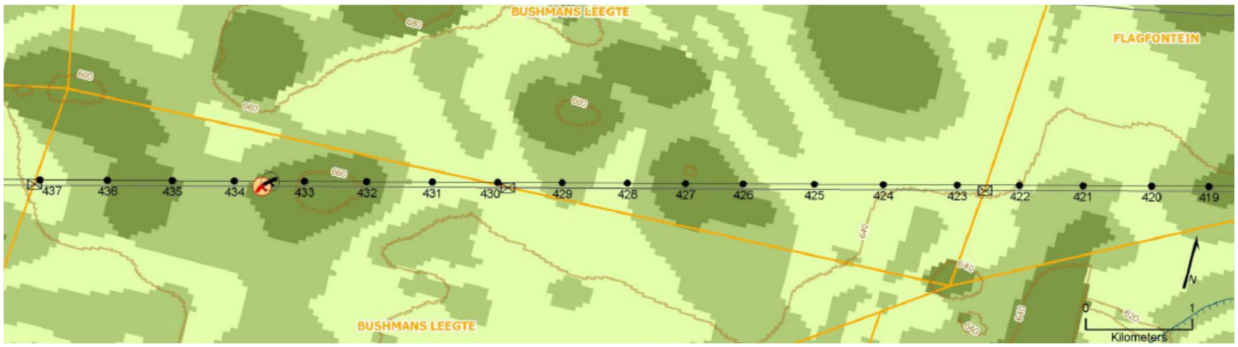

Figure 1: Example of an environmental sensitivity map in the context of a final overhead transmission and distribution profile.

The national web-based environmental screening tool was utilised for this project, the layout and the grid connection corridor sensitivity maps can be seen in Figures 2 to 11.

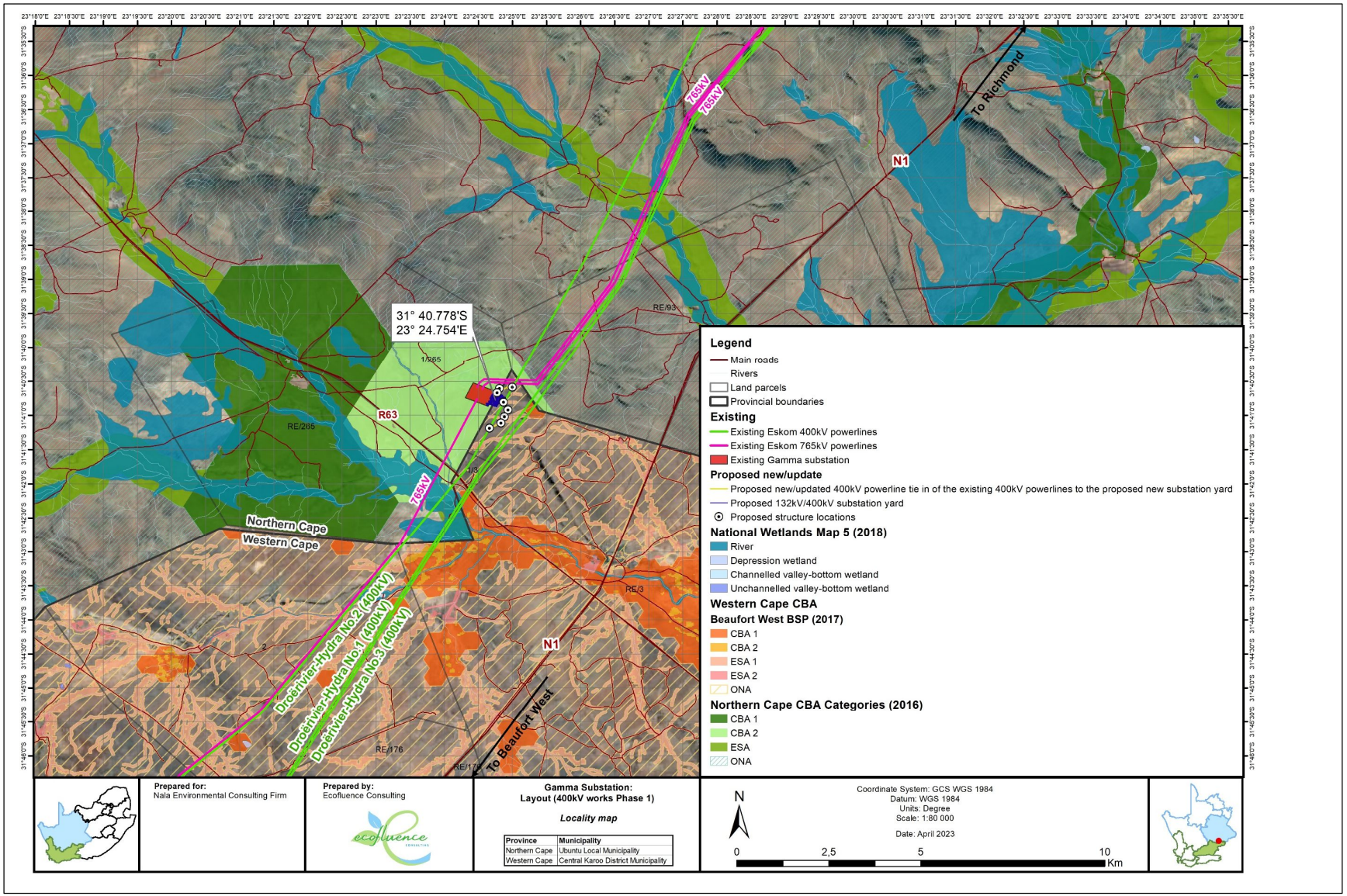

Figure 2: Locality Map of the proposed update to the existing Gamma Substation

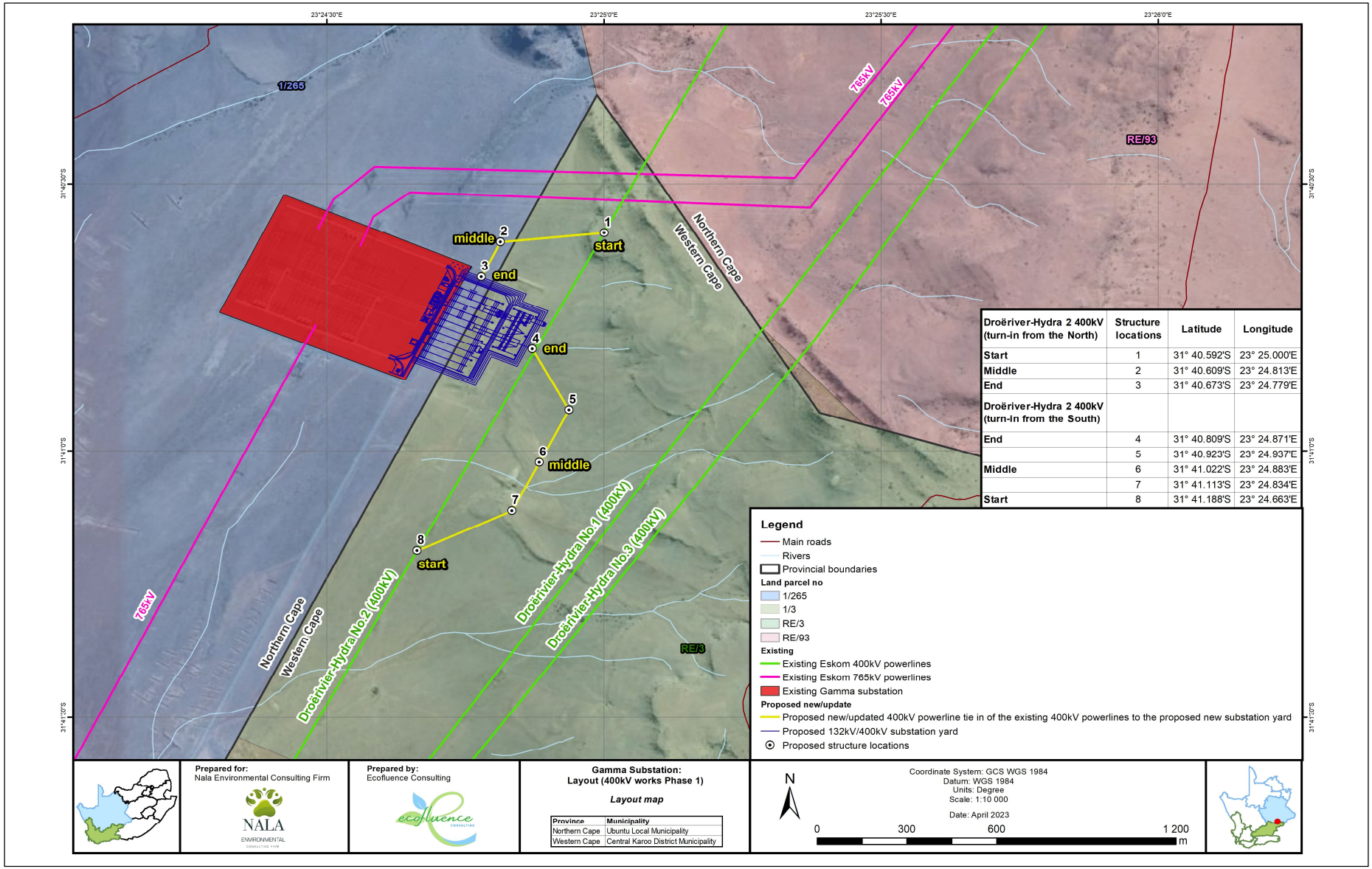

Figure 3: Layout for the proposed update to the existing Gamma Substation yard

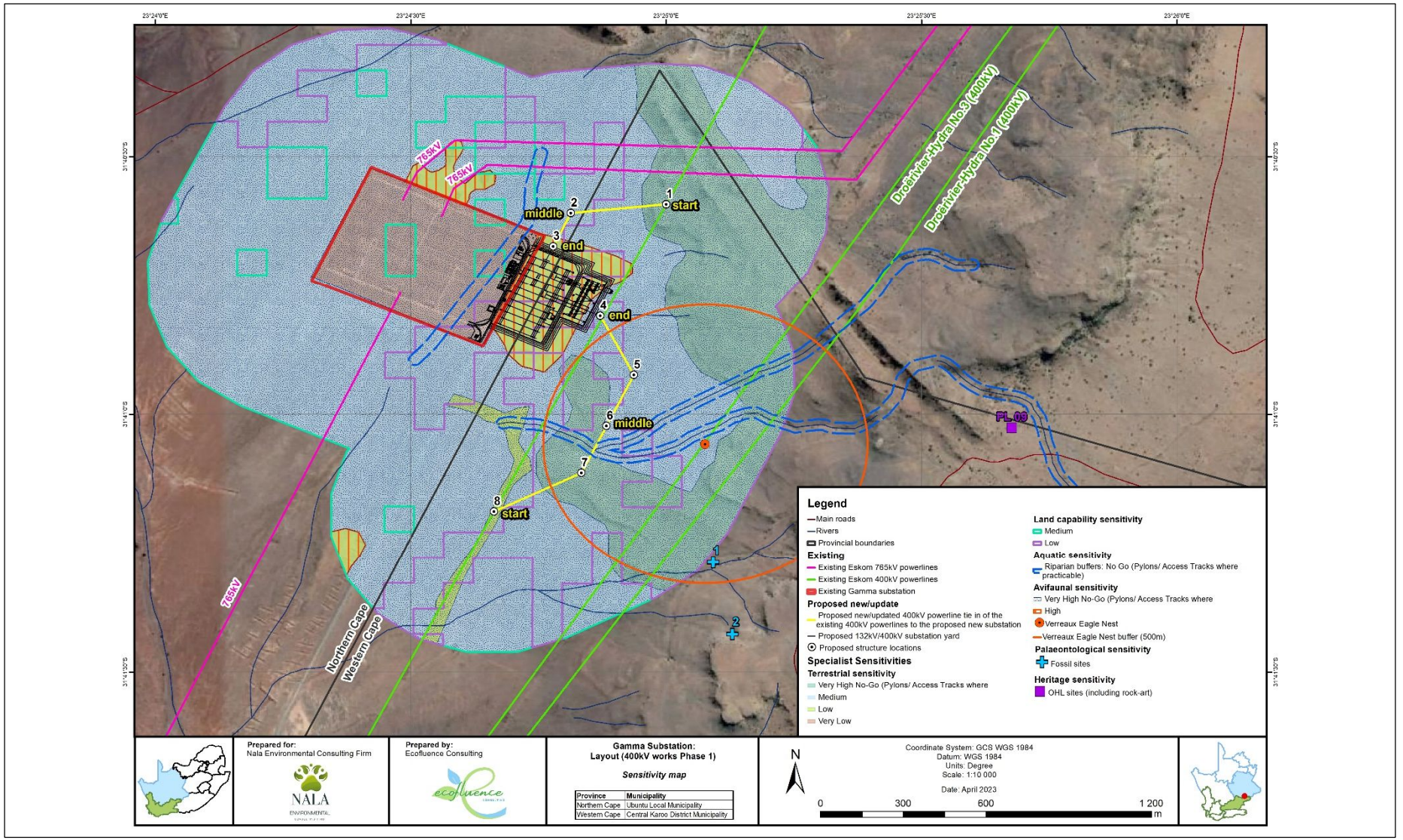

Figure 4: Sensitivity Map for the proposed update to the existing Gamma Substation yard

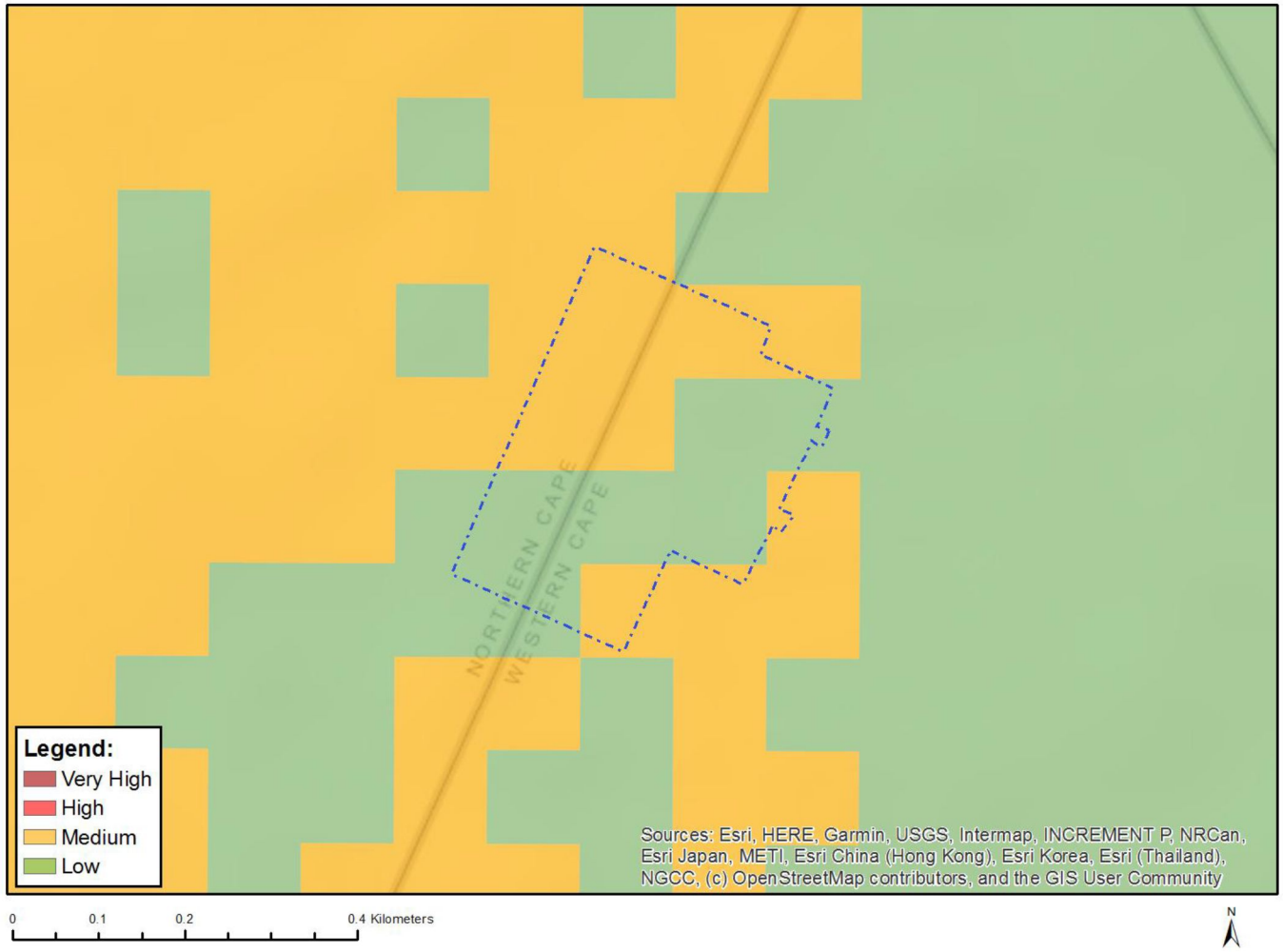

Figure 5: Map of relative agriculture theme sensitivity for the 132kV/400kV substation yard.

Figure 6: Map of relative animal species theme sensitivity for the 132kV/400kV substation yard.

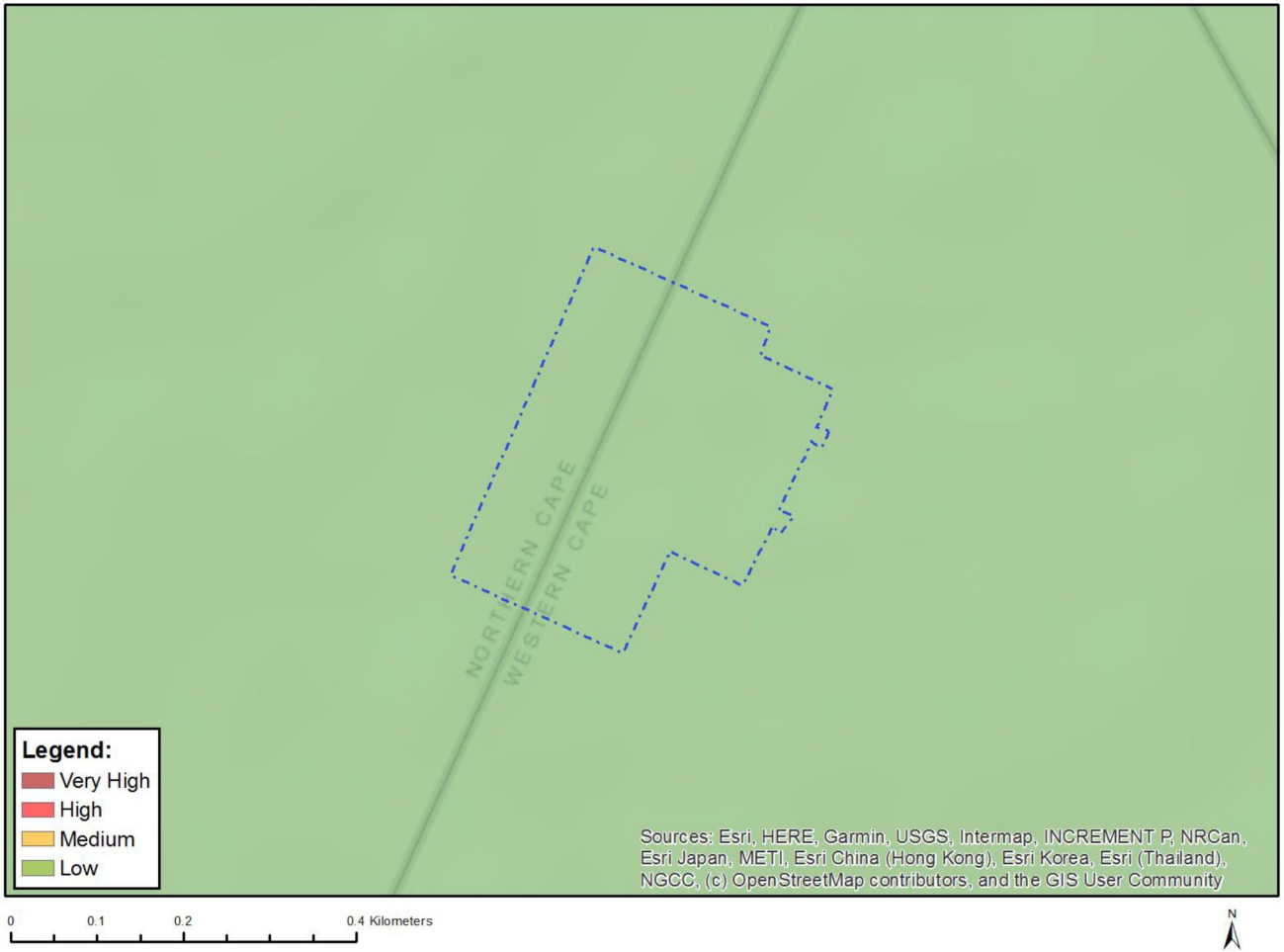

Figure 7: Map of relative aquatic biodiversity theme sensitivity for the 132kV/400kV substation yard.

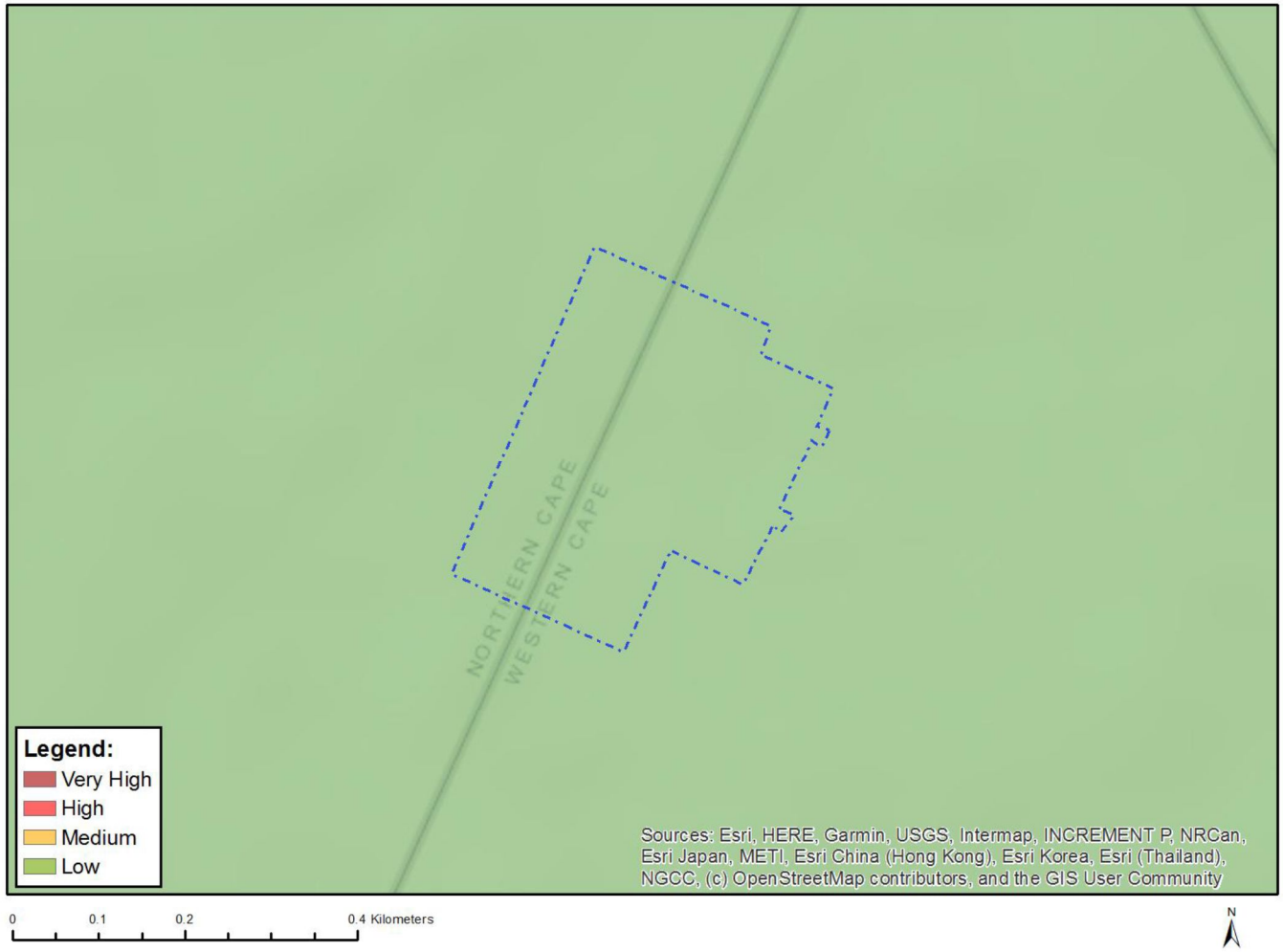

Figure 8: Map of relative archaeological and cultural heritage theme sensitivity for the 132kV/400kV substation yard.

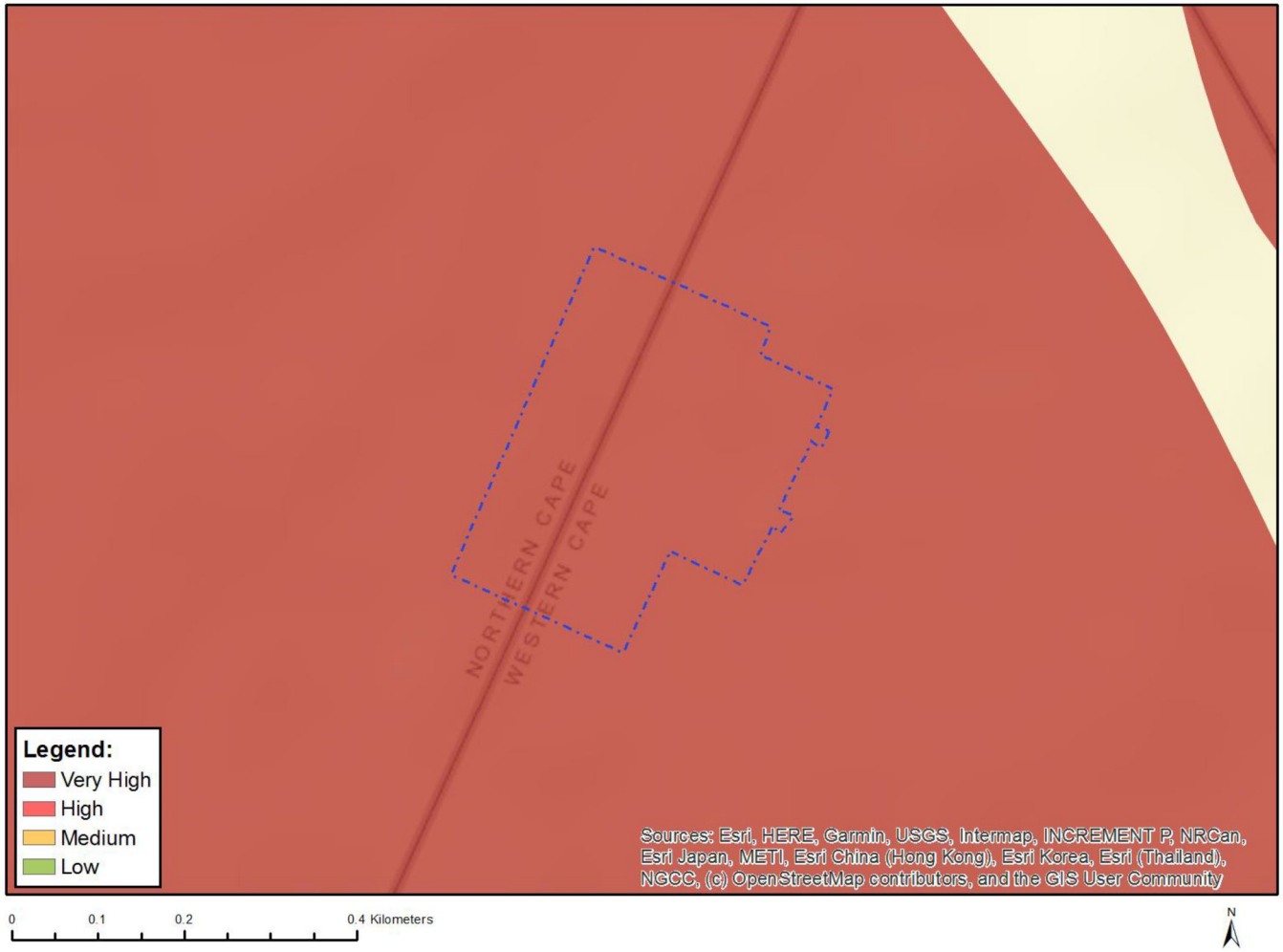

Figure 9: Map of relative palaeontology theme sensitivity for the 132kV/400kV substation yard.

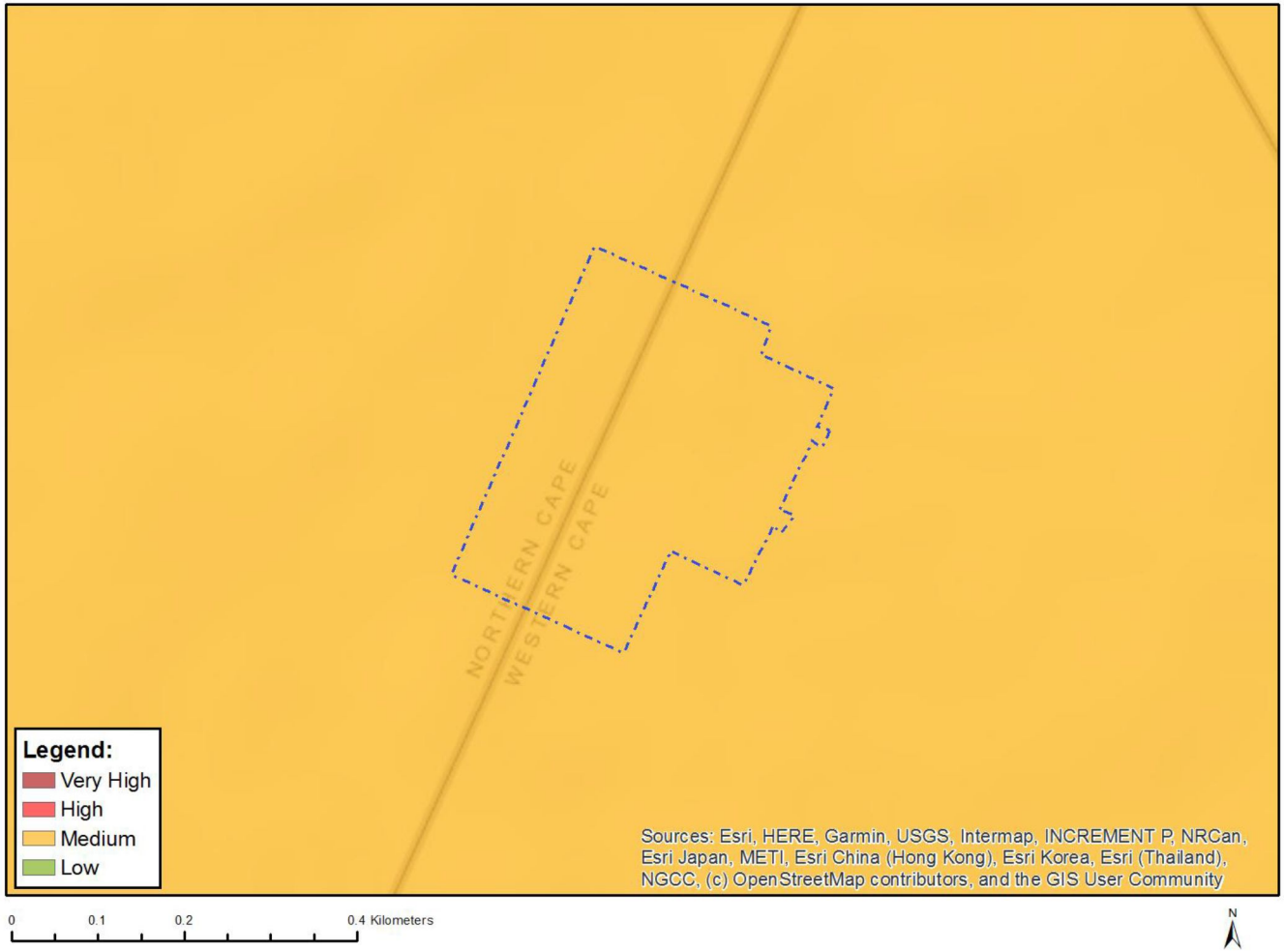

Figure 10: Map of relative plant species theme sensitivity for the 132kV/400kV substation yard.

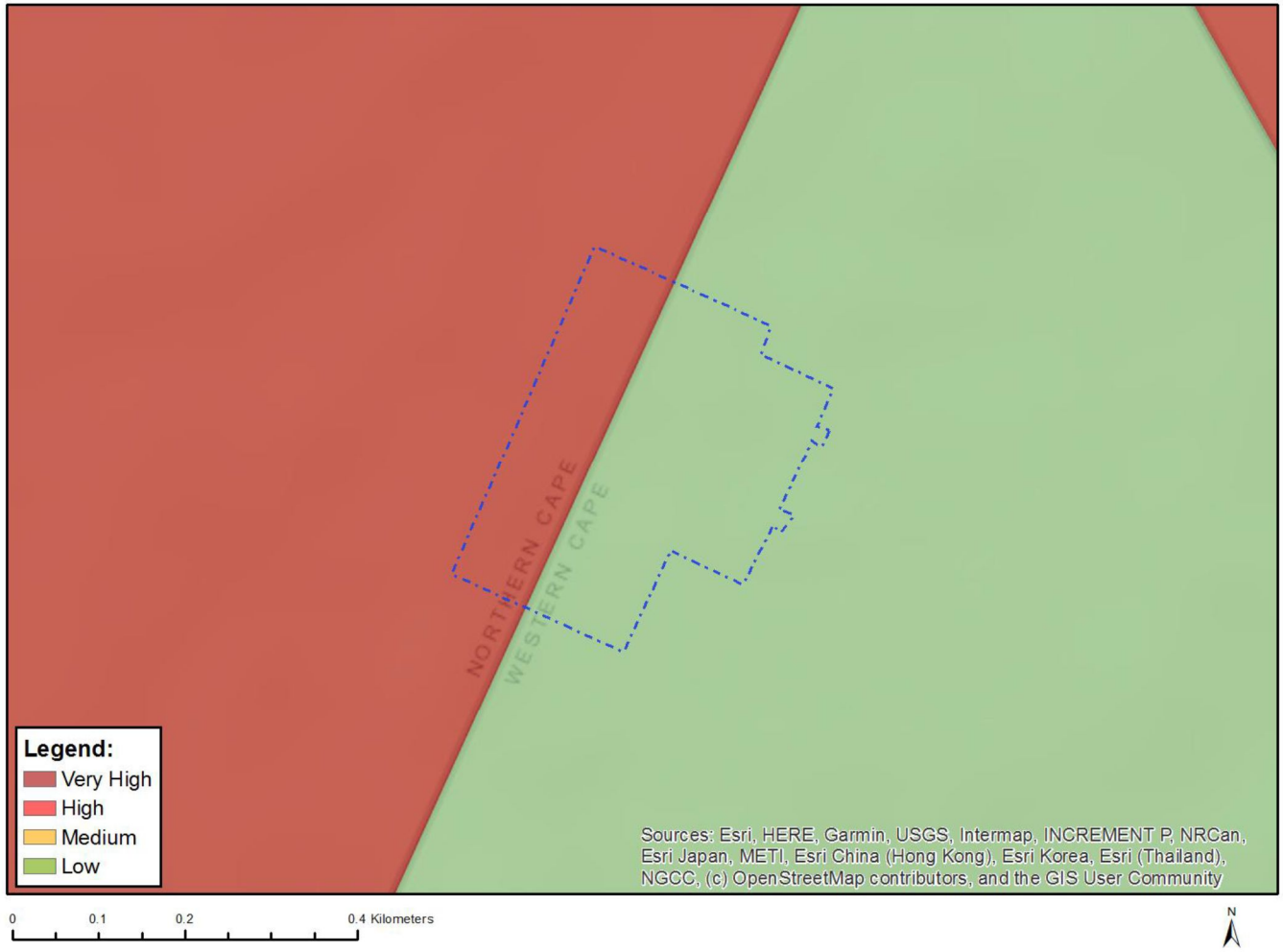

Figure 11: Map of relative terrestrial biodiversity theme sensitivity for the 132kV/400kV substation yard.

7.1. 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.

16/02/2023

Signature Proponent/applicant/ holder of EA Date:

<u>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.</u>

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

Should the EA be transferred to a new holder, <u>Part B: Section 2</u> 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 <u>Part B: Section 2</u> not be submitted. Once approved, <u>Part B: Section 2</u> 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 generic 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 generic 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 attribute.

8.1 Terrestrial Ecology: Vegetation & Habitats

Impact management outcome: Reduce potential impact on flora ecology within the substation yard footprint						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
Clearing of vegetation should be minimized and avoided where possible.	Project manager Environmental Officer	All activities must be restricted to flat areas as far as possible. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to the project area vegetation type. Site construction footprint as per the authorised layout is to be demarcated with no construction activities permitted outside of the demarcated development footprint. The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas thereby causing further encroachment of invasive species.	Life of operation Design Phase, Construction Phase, Operational Phase, Decommissioning Phase.	Project manager, contractor Environmental Officer (cEO), ECO	Ongoing	No unnecessary clearance of indigenous vegetation is undertaken. Evidence of site demarcation as per ECO reports.

		All disturbed footprints to be rehabilitated and landscaped after construction is complete. Rehabilitation of the disturbed areas existing in the project area must be made a priority. Disturbance of indigenous vegetation must be kept to a minimum. Where disturbance is unavoidable, disturbed areas should be rehabilitated as quickly as possible. Earthworks during construction phase and maintenance phase are to be done during the dry season to minimise potential negative environmental impacts.				
Existing servitudes, access routes, and especially roads must be made use of.	Environmental Officer & Design Engineer	Where feasible all access roads should use existing farm roads before new roads are constructed;	Construction/Operational Phase	Project Manager Environmental Control Officer (ECO)	Ongoing	Activities to be monitored by the ECO in compliance with the EMPr and conditions of the EA. Evidence as per ECO reporting.
All laydown, chemical toilets etc. should be restricted to outside of the project area.	Environmental Officer & Design Engineer & Environmental Officer	Chemical toilets are to be placed outside of watercourses, drainage areas and high sensitivity areas as per the authorised layout. This is to be guided by the ECO. No materials may not be stored within the project area, and all	Construction/Operational Phase	Project Manager, Developer Site Supervisor (DSS)	Ongoing during construction	Evidence as per ECO reporting

		materials must be removed from the project area once the construction phase has been concluded. No permanent construction structures/formwork should be permitted. No storage of vehicles or equipment will be allowed outside of the designated project areas.		Environmental Control Officer (ECO)		
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events and strong winds.	Environmental Officer & Contractor	This is to be done according to the Re-vegetation and Habitat Rehabilitation Plan. All bare areas, as a result of the development, should be revegetated with locally occurring species, to bind the soil and limit erosion potential. Eroded areas must be rehabilitated using the appropriate techniques and re-vegetated using indigenous flora. This will also reduce the likelihood of encroachment by alien invasive plant species.	Operational phase	Project Manager / ECO	Ongoing	Monitor and implement the methods of minimising the impacts. Evidence as per ECO reporting
All livestock should always be kept out of the project area, especially	Contractor Environmental Officer & Contractor	Develop a procedure for dealing with livestock within the affected properties	Operational phase	ECO	Once, prior to the commencement of construction	Written consent provided by the landowner and proof of representation of the landowner during interference

areas that have been recently re-planted.					and as and when required during the construction phase	
A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas.	Environmental Officer & Contractor	Provide an appropriate number of spill kits in relevant areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles or machinery and equipment when not in use.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	Project Manager / Contractors / Developer Site Supervisor (DSS) / ECO	Ongoing	Proof of appropriate number of spill kits in appropriate areas to be provided by the contractor. Proof of spill management plan on file. Proof of spill incidents as per ECO reporting. Evidence as per ECO reporting Proof of appropriate number of spill kits in appropriate areas to be provided by the contractor.
No servicing of equipment to take place within the project area unless necessary.	Environmental Officer & Contractor	Ensure that a drip tray is available for any emergency repairs required	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	ECO	Monthly	Contractor to provide evidence of drip tray use for emergency repairs

All contaminated soil/yard stone shall be treated in situ or removed and placed in containers.	Environmental Officer & 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.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	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
Appropriately store equipment containing oil through the use of drip trays or other suitable methods	Environmental Officer & Contractor	Appropriately contain any diesel or oil storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from leaking and entering the environment. Construction activities and vehicles could cause the spillage of lubricants, fuels and waste material potentially negatively affecting the functioning of the ecosystem. All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the project area.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	Eco	Monthly / Ongoing	Photographic record of appropriate storage of equipment containing oil
It should be made an offence for any staff to take/ bring any plant species into/out of any	Project Manager	No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or	Design Phase, Construction Phase, Operational Phase,	ECO	Monthly, and as and when required	No instances of poaching is reported

portion of the project area.	Environmental Officer	invasive species or the illegal collection of plants. All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement	Decommissioning Phase Life of Operation			Monitor and implement the methods of minimising the impacts. Evidence as per ECO reporting
A fire management plan needs to be compiled and implemented to restrict the impact that fire might have on the surrounding areas.	Environmental Officer & Contractor	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.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	ECO	Once, prior to the commencement of construction and weekly during the construction phase	Compliance with the Emergency Preparedness, Response and Fire Management Plan (Appendix 6)
Apply for a permit to relocate and transplant protected plant species into the suitable areas	Project Manager, Environmental Officer	Any protected plant that may be present needs a relocation or destruction permit for any individual that may be removed or destroyed due to the development. If left undisturbed the sensitivity and importance of these species needs to be part of the environmental awareness program. All protected and red-list plants should be relocated, along with as many other geophytic species as possible.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	Project Manager Environmental Control Officer (ECO)	Once-off during construction	Acquired permits for relocation or enforcement thereof

Plant search and rescue must be conducted prior to construction	Relevant specialist in consultation with the Contractor.	Develop and implement a Plant search and rescue which must be conducted prior to construction. 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	Planning Phase, Pre-Construction	ECO	Weekly, and as when required	Implementation of the Plant Search and Rescue Plan and photographic evidence and notes of the implementation of the plan
A qualified environmental control officer must be on site when construction begins. Should any large nests be observed within the project area construction should stop immediately and a qualified specialist must be contacted.	Environmental Officer, Contractor	Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated.	Construction Phase	Project Manager Contractor	Ongoing	Acquired permits for relocation or enforcement thereof
The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments:	Project Manager, Environmental Officer	Site construction footprint as per the authorised layout is to be demarcated with no construction activities permitted outside of the demarcated development footprint.	Construction/Operational Phase	Project Manager / ECO	Ongoing	Monitor and implement the methods of minimising the impacts. Evidence of site demarcation as per ECO reports

• Signs must be put up to enforce this.						
The duration of the construction should be minimized to as short term as possible, to reduce the period of disturbance on fauna.	Project Manager Environmental Officer Design Engineer	Project timelines for construction activities within high biodiversity areas are to be minimized as far as possible. Where possible, earthworks during construction phase are to be done during the dry season to minimise potential negative environmental impacts.	Construction Phase	Project Manager Contractor Environmental Control Officer (ECO)	Ongoing	As per project timelines.
Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to nocturnal mammals.	Environmental Officer	Ensure that noise limits do not exceed acceptable limits and avoid the use of amplification communication	Construction Phase, Operational Phase, Decommissioning Phase	Project Manager Contractor dEO / ECO Developer Site Supervisor (DSS)	Ongoing	No complaints registered in this regard. No amplification equipment is used.
No trapping, killing, or poisoning of any wildlife is to be allowed: • Signs must be put up to enforce this.	Environmental Officer	All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	Project Manager Contractor	Ongoing	No instances of deliberate or intentional killing is reported
All construction and maintenance motor vehicle operators should undergo an environmental induction	Health and Safety Officer	Inform all drivers of speed limits and place appropriate signage along the relevant roads.	Design Phase, Construction Phase, Operational Phase,	ECO Operation and Maintenance contractor	Monthly	No complaints from community members are submitted

that includes instruction on the need to comply with speed limits, to respect all forms of wildlife.		Speed limits must still be enforced to ensure that road killings, dust and erosion is limited. The speed limits should be restricted to a maximum of 30 km/h within the project area.	Decommissioning Phase Life of Operation			
Speed limits of 30 km/h must be put in place to reduce erosion.	Developer's Project Manager, Environmental Officer	Inform all drivers of speed limits and place appropriate signage along the relevant roads. Dust generated, especially by earth moving machinery, must be minimised through wetting of the soil surface and putting up signs to enforce speed limits. Speed bumps must be built to force slow speeds. Signs must be put up to enforce this.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase	ECO Operation and Maintenance contractor	Monthly	No complaints from community members are submitted
Outside lighting should be designed and limited to minimize impacts on fauna.	Project manager, Environmental Officer & Design Engineer	Illumination of building at night must only be undertaken as necessary for operation. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights should be used wherever possible.	Construction/Operational Phase	Project manager, Environmental Officer & Design Engineer	Ongoing	Photographic evidence and visual inspection.
Schedule activities and operations during least sensitive periods, to	Project Manager, Environmental Officer &	Avoid breeding sites and ensure that special care is taken in the presence of nestlings and fledgelings.	Design Phase, Construction Phase, Operational	ECO	Weekly, and as and when required during the	Photographic record of intact breeding sites

avoid migration, nesting and breeding seasons: Driving on access roads at night should be restricted in order to reduce or prevent wildlife road mortalities which occur more frequently during this period.	Design Engineer		Phase, Decommissioning Phase Life of Operation	Operation and maintenance contractor	construction. Monthly, and as and when required during operation	
Any holes/deep excavations must be dug and planted in a progressive manner and should not be left open overnight: Should the holes remain open overnight they must be covered temporarily to ensure no small fauna species fall in.	Environmental Officer & Contractor, Engineer	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. Where possible, earthworks during construction are to be done during the dry season.	Planning and Construction	ECO	Weekly	Excavations are fenced where required and photographic proof can be provided
Ensure that cables and connections are insulated successfully and adequately to reduce electrocution risk.	Environmental Officer & Contractor, Engineer	Implement and maintain insulation on cables	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of project	ECO Operation and maintenance contractor	Once, during the construction and as and when required. Monthly during operation	Photographic record of the implementation and maintenance

Compilation of and implementation of an Alien Invasive Plant Management Plan for the project area.	Project manager, Environmental Officer & Contractor	An alien invasive plant management plan needs to be compiled and implemented post construction to control current invaded areas and prevent the growth of invasives on cleared areas	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	ECO cEO Operation and maintenance team	Before commencement and Ongoing	Monitor and implement the methods of minimising the impacts. Evidence as per ECO reporting. Photographic record of implementation and maintenance.
The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas.	Project Manager, Environmental Officer & Contractor	The footprint area of the construction should be kept to a minimum. Areas of indigenous vegetation outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. The footprint of the roads must be kept to prescribed widths. Clearing of vegetation should be minimized and avoided where possible. All activities must be restricted to flat areas as far as possible. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon.	Construction Phase & Operational Phase,	Project Manager Environmental Control Officer (ECO) cEO	Ongoing	No unnecessary clearance of indigenous vegetation is undertaken. Evidence of site demarcation as per ECO reports

Waste management must be a priority and all waste must be collected and stored adequately.	Environmental Officer & Health and Safety Officer	Disposal of general waste at licensed waste disposal facilities must be undertaken. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests from entering the site	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	ECO	Monthly	Disposal certificates of disposal at licensed facilities to be provided
A pest control plan must be put in place and implemented; it is imperative that poisons not be used due to the presence of faunal SCC in the area.	Environmental Officer & Health and Safety Officer	Only environmentally friendly pest control must be used, when required.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	ECO	As and when pest control is required for the project	Contractor to provide proof of pest control used being environmentally friendly
Dust-reducing mitigation measures must be put in place and must be strictly adhered to.	Contractor	Apply appropriate dust suppressant. This includes wetting of exposed soft soil surfaces. No non-environmentally friendly suppressants may be used as this could result in the pollution of valuable water sources.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	ECO	Weekly	Contractor to provide proof of use of appropriate dust suppressants
Waste management must be a priority and all waste must be collected and stored effectively.	Environmental Officer Contractor	Disposal of general waste at licensed waste disposal facilities must be undertaken	Life of Operation	ECO	Monthly	Disposal certificates of disposal at licensed facilities to be provided

Litter, spills, fuels, chemical and human waste in and around the project area must be cleared and safely/appropriately stored immediately.	Contractor, Health and Safety Officer, Environmental Officer & Contractor	Develop and implement a waste management plan	Construction/Operation/Closure Phase	ECO	Monthly	Implementation of the waste management plan and proof of waste management through proof of responsible disposal
A minimum of one toilet must be provided per 10 persons.	Contractor Environmental Officer & Contractor	Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area. The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility. The installation of the toilets by the Contractor must be as per the listed requirements	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase	ECO	Weekly	No evidence of non-compliance identified
Where a registered disposal facility is not available close to the project area, the Contractor shall provide a method statement with regard to waste management. Under no circumstances may domestic waste be burned on site or stored in pits.	Contractor Environmental Officer, Contractor	Use a licensed waste disposal facility for the disposal of excess spoil	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase	ECO	Monthly	Certificates obtained for the disposal of excess spoil at a licensed waste disposal facility

Refuse bins will be emptied and secured. Temporary storage of domestic waste shall be in covered waste skips. Maximum domestic waste storage period will be 10 days.	Contractor Environmental Officer, Contractor	Ensure refuse bins are emptied and secured prior to site closure	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase	ECO	Prior to site closure for more than 05 days	Refuse bins are emptied and secured prior to site closure
All personnel and contractors to undergo Environmental Awareness Training.	Contractor Environmental Officer, Contractor	Hold environmental awareness training workshops. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within and in close proximity to the project area such as the nearby rocky outcrops and to inform contractors and site staff of the presence of red-listed faunal species (such as the Riverine rabbit), their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr. The avoidance and protection of the high sensitivity areas must be included in a site induction. Contractors and employees must all undergo the induction and be made	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase	ECO dEO	Monthly and as and when required	Attendance register and training minutes / notes for the record

		aware of the "no-go" areas to be avoided.				
Where possible, existing access routes and walking paths must be made use of.	Developer's Project Manager, Contractor Environmental Officer	Where feasible all access roads should use existing farm roads before new roads are constructed;	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase	Project Manager ECO Operation and Maintenance team	Ongoing	Activities to be monitored by the ECO in compliance with the EMPr and conditions of the EA. Evidence as per ECO reporting. No complaints from community members are submitted
Impact management outcome: Reduce potential impact on terrestrial ecology within the substation yard footprint						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
Clearing of vegetation should be minimized and avoided where possible. All disturbed footprints to be rehabilitated and landscaped after construction is complete. Rehabilitation of the disturbed areas existing in the project area must be made a priority.	Project manager Environmental Officer	All activities must be restricted to flat areas as far as possible. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to the project area vegetation type.	Life of operation	Project Manager Environmental Officer	Ongoing	No unnecessary clearance of indigenous vegetation is undertaken. Evidence of site demarcation as per ECO reports

Existing servitudes, access routes, and especially roads must be made use of.	Environmental Officer Design Engineer	Where feasible all access roads should use existing farm roads before new roads are constructed	Construction/Operational Phase	Project Manager Environmental Control Officer (ECO)	Ongoing	Activities to be monitored by the ECO in compliance with the EMPr and conditions of the EA. Evidence as per ECO reporting.
All laydown, chemical toilets etc. should be restricted to outside of the project area.	Environmental Officer Design Engineer	Chemical toilets are to be placed outside of watercourses, drainage areas and high sensitivity areas as per the authorised layout. This is to be guided by the ECO. No materials may not be stored within the project area, and all materials must be removed from the project area once the construction phase has been concluded. No permanent construction structures/formwork should be permitted. No storage of vehicles or equipment will be allowed outside of the designated project areas.	Construction/Operational Phase	Project Manager, Developer Site Supervisor (DSS) Environmental Control Officer (ECO)	Ongoing during construction	Evidence as per ECO reporting
Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to	Environmental Officer & Contractor	This will also reduce the likelihood of encroachment by alien invasive plant species. All bare areas, as a result of the development, should be	Operational phase	Project Manager ECO	Ongoing	Monitor and implement the methods of minimising the impacts. Evidence as per ECO reporting

prevent erosion during flood and wind events.		revegetated with locally occurring species, to bind the soil and limit erosion potential. Eroded areas must be rehabilitated using the appropriate techniques and re-vegetated using indigenous flora.				
The stormwater must be managed as part of the plan for the existing Gamma substation.	Project Manager Environmental Officer	An appropriate stormwater management plan must be developed	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	ECO	Before commencement and Ongoing	Monitor and implement the methods of minimising the impacts. Implementation of erosion control measures. Evidence as per ECO reporting.
All livestock should always be kept out of the project area, especially areas that have been recently re-planted.	Contractor Environmental Officer & Contractor	Develop a procedure for dealing with livestock within the affected properties	Operational 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
A hydrocarbon spill management plan must be put in place to ensure that should there be any	Environmental Officer & Contractor	Provide an appropriate number of spill kits in relevant areas.	Design Phase, Construction Phase, Operational	Project Manager	Ongoing	Proof of appropriate number of spill kits in appropriate areas to be provided by the contractor.

chemical spill out or over that it does not run into the surrounding areas.		The Contractor must be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use	Phase, Decommissioning Phase Life of Operation	Contractors Developer Site Supervisor (DSS) ECO		Proof of spill management plan on file. Proof of spill incidents as per ECO reporting.
No servicing of equipment to take place within the project area unless necessary.	Environmental Officer & Contractor	Ensure that a drip tray is available for any emergency repairs required	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	ECO	Monthly	Contractor to provide evidence of drip tray use for emergency repairs
All contaminated soil/yard stone shall be treated in situ or removed and placed in containers.	Environmental Officer & 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	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	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
Appropriately store equipment containing oil through the use of drip trays or other suitable methods	Environmental Officer & Contractor	Appropriately contain any diesel or oil storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them from	Design Phase, Construction Phase, Operational Phase,	ECO	Monthly	Photographic record of appropriate storage of equipment containing oil

		leaking and entering the environment. Construction activities and vehicles could cause the spillage of lubricants, fuels and waste material potentially negatively affecting the functioning of the ecosystem. All vehicles and equipment must be maintained, and all re-fuelling and servicing of equipment is to take place in demarcated areas outside of the project area.	Decommissioning Phase Life of Operation			
It should be made an offence for any staff to take/ bring any plant species into/out of any portion of the project area.	Project Manager Environmental Officer	All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	ECO	Monthly, and as and when required	No instances of poaching is reported
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.	Environmental Officer & Contractor	A fire management plan needs to be compiled and implemented to restrict the impact that fire might have on the surrounding areas.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase	ECO	Once, prior to the commencement of construction and weekly during the construction phase	Compliance with the Emergency Preparedness, Response and Fire Management Plan

			Life of Operation			
Apply for a permit to relocate and transplant protected plant species into the suitable areas	Project Manager Environmental Officer	Any protected plant that may be present needs a relocation or destruction permit for any individual that may be removed or destroyed due to the development. If left undisturbed the sensitivity and importance of these species needs to be part of the environmental awareness program. All protected and red-list plants should be relocated, along with as many other geophytic species as possible.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	Project Manager Environmental Control Officer (ECO)	Once-off during construction	Acquired permits for relocation or enforcement thereof
Plant search and rescue must be conducted prior to construction. 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	Project manager Environmental Officer Contractor	Develop and implement a Plant search and rescue which must be conducted prior to construction.	Planning Phase, Pre-Construction	ECO	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

A qualified environmental control officer must be on site when construction begins. Should any large nests be observed within the project area construction should stop immediately and a qualified specialist must be contacted.	Environmental Officer Contractor	Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated.	Construction Phase	Project Manager Contractor	Ongoing	Acquired permits for relocation or enforcement thereof
The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments: • Signs must be put up to enforce this.	Project Manager Environmental Officer	Site construction footprint as per the authorised layout is to be demarcated with no construction activities permitted outside of the demarcated development footprint.	Construction/Operational Phase	Project Manager ECO	Ongoing	Monitor and implement the methods of minimising the impacts. Evidence of site demarcation as per ECO reports
The duration of the construction should be minimized to as short term as possible, to reduce the period of disturbance on fauna.	Project Manager Environmental Officer Design Engineer	Project timelines for construction activities within high biodiversity areas are to be minimized as far as possible. Where possible, earthworks during construction phase are to be done during the dry season to minimise potential negative environmental impacts.	Construction Phase	Project Manager Contractor Environmental Control Officer (ECO)	Ongoing	As per project timelines.

Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to nocturnal mammals.	Environmental Officer	Ensure that noise limits do not exceed acceptable limits and avoid the use of amplification communication	Construction/Operational Phase	Project Manager Contractor Developer Site Supervisor (DSS)	Ongoing	No complaints registered in this regard. No amplification equipment is used.
No trapping, killing, or poisoning of any wildlife is to be allowed: • Signs must be put up to enforce this.	Environmental Officer	All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	Project Manager Contractor	Ongoing	No instances of deliberate or intentional killing is reported
All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife.	Health and Safety Officer	Inform all drivers of speed limits and place appropriate signage along the relevant roads. Speed limits must still be enforced to ensure that road killings, dust and erosion is limited. The speed limits should be restricted to a maximum of 30 km/h within the project area.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	ECO Operation and Maintenance contractor	Monthly	No complaints from community members are submitted
Speed limits of 30 km/h must be put in place to reduce erosion: • Dust generated, especially by earth moving machinery,	Project Manager Environmental Officer	Inform all drivers of speed limits and place appropriate signage along the relevant roads	Design Phase, Construction Phase, Operational Phase,	ECO Operation and Maintenance contractor	Monthly	No complaints from community members are submitted

must be minimised through wetting of the soil surface and putting up signs to enforce speed limits. Speed bumps must be built to force slow speeds; • Signs must be put up to enforce this.			Decommissioning Phase Life of Operation			
Outside lighting should be designed and limited to minimize impacts on fauna.	Project manager Environmental Officer Design Engineer	Illumination of building at night must only be undertaken as necessary for operation. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights should be used wherever possible.	Construction/Operational Phase	Project manager Environmental Officer Design Engineer	Ongoing	Photographic evidence and visual inspection
Schedule activities and operations during least sensitive periods, to avoid migration, nesting and breeding seasons. Driving on access roads at night should be restricted in order to reduce or prevent wildlife road mortalities which	Project Manager Environmental Officer Design Engineer	Avoid breeding sites and ensure that special care is taken in the presence of nestlings and fledgelings	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	ECO Operation and maintenance contractor	Weekly, and as and when required during the construction. Monthly, and as and when required during operation	Photographic record of intact breeding sites

occur more frequently during this period.						
Any holes/deep excavations must be dug and planted in a progressive manner and should not be left open overnight: Should the holes remain open overnight they must be covered temporarily to ensure no small fauna species fall in.	Environmental Officer & Contractor Engineer	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. Where possible, earthworks during construction and maintenance are to be done during the dry season.	Planning and Construction	ECO	Weekly	Excavations are fenced where required and photographic proof can be provided
Ensure that cables and connections are insulated successfully and adequately to reduce electrocution risk.	Environmental Officer & Contractor Engineer	Implement and maintain insulation on cables.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of project	ECO Operation and maintenance contractor	Once, during the construction and as and when required. Monthly during operation	Photographic record of the implementation and maintenance
Compilation of and implementation of an Alien Invasive Plant Management Plan for the project area.	Project manager Environmental Officer	An alien invasive plant management plan (Appendix 7) needs to be compiled and implemented post construction to control current invaded areas and prevent the growth of invasives on cleared areas	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase	ECO cEO	Before commencement and Ongoing	Monitor and implement the methods of minimising the impacts. Evidence as per ECO reporting.

	Contractor		Life of Operation			
Areas of indigenous vegetation outside of the direct project footprint, should under no circumstances be fragmented or disturbed further.	Project Manager Environmental Officer Contractor	The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. The footprint of the roads must be kept to prescribed widths. Clearing of vegetation should be minimized and avoided where possible. All activities must be restricted to flat areas as far as possible. It is recommended that areas to be developed be specifically demarcated so that during the construction phase, only the demarcated areas be impacted upon.	Construction Phase & Operational Phase,	Project Manager Environmental Control Officer (ECO) cEO	Ongoing	No unnecessary clearance of indigenous vegetation is undertaken. Evidence of site demarcation as per ECO reports
Waste management must be a priority and all waste must be collected and stored adequately.	Environmental Officer Health and Safety Officer	Disposal of general waste at licensed waste disposal facilities must be undertaken. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests from entering the site	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	ECO	Monthly	Disposal certificates of disposal at licensed facilities to be provided

A pest control plan must be put in place and implemented; it is imperative that poisons not be used due to the presence of faunal SCC in the area.	Environmental Officer Health and Safety Officer	Only environmentally friendly pest control must be used, when required.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	ECO	As and when pest control is required for the project	Contractor to provide proof of pest control used being environmentally friendly
Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes wetting of exposed soft soil surfaces. No non-environmentally friendly suppressants may be used as this could result in the pollution of valuable water sources.	Contractor	Apply appropriate dust suppressant	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	ECO	Weekly	Contractor to provide proof of use of appropriate dust suppressants
Waste management must be a priority and all waste must be collected and stored effectively.	Contractor	Disposal of general waste at licensed waste disposal facilities must be undertaken	Life of Operation	ECO	Monthly	Disposal certificates of disposal at licensed facilities to be provided
Litter, spills, fuels, chemical and human waste in and around the project area must be cleared and safely/appropriately stored immediately.	Environmental Officer Health & Safety Officer	Develop and implement a waste management plan	Construction/Operation/Closure Phase	ECO	Monthly	Implementation of the waste management plan and proof of waste management through proof of responsible disposal

A minimum of one toilet must be provided per 10 persons. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area. The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility.	Environmental Officer Health & Safety Officer	The installation of the toilets by the Contractor must be as per the listed requirements	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	ECO	Weekly	No evidence of non-compliance identified
Where a registered disposal facility is not available close to the project area, the Contractor shall provide a method statement with regard to waste management. Under no circumstances may domestic waste be burned on site or stored in pits.	Environmental Officer Health & Safety Officer	Use a licensed waste disposal facility for the disposal of excess spoil	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	ECO	Monthly	Certificates obtained for the disposal of excess spoil at a licensed waste disposal facility
Refuse bins will be emptied and secured.	Environmental Officer	Ensure refuse bins are emptied and secured prior to site closure	Design Phase, Construction	ECO	Prior to site closure for	Refuse bins are emptied and secured prior to site closure

Temporary storage of domestic waste shall be in covered waste skips. Maximum domestic waste storage period will be 10 days.	Health & Safety Officer		Phase, Operational Phase, Decommissioning Phase Life of Operation		more than 05 days	
All personnel and contractors to undergo Environmental Awareness Training.	Health & Safety Officer	Hold environmental awareness training workshops. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within and in close proximity to the project area such as the nearby rocky outcrops and to inform contractors and site staff of the presence of red-listed faunal species (such as the Riverine rabbit), their identification, conservation status and importance, biology, habitat requirements and management requirements in line with the Environmental Authorisation and within the EMPr. The avoidance and protection of the high sensitivity areas must be included in a site induction. Contractors and employees must all undergo the induction and be made aware of the "no-go" areas to be avoided.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	ECO dEO	Monthly and as and when required	Attendance register and training minutes / notes for the record

Where possible, existing access routes and walking paths must be made use of.	Project Manager Environmental Officer	Where feasible all access roads should use existing farm roads before new roads are constructed;	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	Project Manager ECO	Ongoing	Activities to be monitored by the ECO in compliance with the EMPr and conditions of the EA. Evidence as per ECO reporting.

8.2 *Soil and Agricultural Impacts*

Impact Management Actions	Implementation			Monitoring		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
To minimise the footprint of construction as much as possible	ECO Contractor Developer's Project Manager	Infrastructure footprint and associated area of disturbance should be minimised as far as practically possible. Where possible, earthworks during construction phase are to be done during the dry season.	Construction	ECO Contractor Developer Site Supervisor (DSS)	During construction phase	ECO's Monthly Checklist/Report
Where soil is removed/disturbed, ensure it is stored for rehabilitation and revegetated as soon as possible.	ECO Contractor Developer's Project Manager	Undertaken rehabilitation of disturbed areas as per the requirements listed under section 5.35	Construction	ECO Contractor Developer Site Supervisor (DSS)	During construction phase	Rehabilitation of disturbed areas is undertaken in-line with the requirements of section 5.35
Implement all appropriate soil conservation measures, including contouring, re-vegetation, geotextiles and slope stabilisation (for all infrastructure).	ECO Contractor Developer's Project Manager	All bare areas, as a result of the development, should be revegetated with locally occurring species, to bind the	During construction and operation	ECO Contractor Developer Site Supervisor (DSS)	Monthly / as or when required	ECO's Monthly Checklist/Report

Impact Management Actions	Implementation			Monitoring		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
		soil and limit erosion potential. Eroded areas must be rehabilitated using the appropriate techniques and re-vegetated using indigenous flora.				
Management of stormwater and discharge from the facility, to avoid scouring of the receiving area.	Environmental Officer Contractor Developer's Project Manager	An appropriate stormwater management plan must be developed	Lifespan of the project	Contractor Environmental Officer Contractor Developer Site Supervisor (DSS)	Before commencement and Ongoing	Monitor and implement the methods of minimising the impacts. Implementation of erosion control measures. Evidence as per ECO reporting.

8.3 Terrestrial fauna and Avifauna Impacts

Impact management outcome: Mitigate terrestrial habitat, faunal impacts during project lifecycle						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
All development areas must be clearly demarcated. No development is to occur in areas possessing 'Very High' Site Ecological Importance (SEI) wherever practicable.	Project Manager Contractor Environmental Officer (cEO)	A site walk through is recommended by a suitably qualified ecologist or Environmental officer prior to any construction activities, preferably during the wet season and any SSC should be noted. In situations where the threatened and protected plants must be removed, the proponent may only do so after the required permission/permits have been obtained in accordance with national and provincial legislation. The disturbance footprint must be strictly controlled. Only the 'High' SEI areas that have been authorised for development should be intruded into. Only the 'High' SEI areas that have been authorised for development should be intruded into.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of operation	Project Manager Contractor Environmental Officer (cEO) ECO	Ongoing	Acquired permits for relocation or enforcement thereof Proof of appointment of the qualified specialist and suitably experienced Environmental officer

All activities must make use of existing roads and tracks as far as practically and feasibly possible. A service track (jeep track) is permissible in Very High SEI areas only to the extent required to establish and maintain the substation powerline, and only if no other access options are available in areas of lower sensitivity.	Project Manager Contractor Contractor Environmental Officer (cEO)	All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	Project Manager ECO Contractor	Ongoing	Evidence as per reported incidents on file.
All laydown areas, chemical toilets etc. should be restricted to existing transformed areas.	Developer's Project Manager Project Manager Foreman	Any materials may not be stored for extended periods of time and must be removed from the project area once the construction phase has been concluded. Use of re-usable/recyclable materials are recommended. Project timelines for construction activities within high biodiversity areas are to be minimized as far as possible.	Construction Phase	Environmental Control Officer (ECO) Developer Site Supervisor (DSS) Contractor Environmental Officer (cEO)	Ongoing	As per project timelines.
Active rehabilitation of areas cleared of invasive plants is recommended.	Project Manager contractor Environmental Officer (cEO)	Progressive rehabilitation of areas that have been cleared of invasive plants will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank. Any woody material removed can be shredded and used in conjunction with the topsoil to	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase	Contractor Environmental Officer & Contractor Environmental Control Officer (ECO)	Ongoing	Evidence as per ECO audit reports

		augment soil moisture and prevent further erosion.	Life of Operation			
Areas that have been disturbed but will not undergo development must be revegetated with indigenous vegetation	Project Manager	Eroded areas must be rehabilitated using the appropriate techniques and re-vegetated using indigenous flora.	Life of Operation	Project Manager Contractor	Annually	Monitor and implement the methods of minimising the impacts. Evidence as per ECO reporting
A spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas.	contractor Environmental Officer (cEO) Contractors Project Manager Foreman	Provide an appropriate number of spill kits in relevant areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	Project Manager Contractors Developer Site Supervisor (DSS)	Ongoing	Proof of appropriate number of spill kits in appropriate areas to be provided by the contractor. Proof of spill management plan on file. Proof of spill incidents as per ECO reporting.
Impact Management Outcome: To reduce potential impacts on Avifauna within the substation footprint						
A qualified ecologist or suitably experienced Environmental Officer must be on site when construction begins to identify avifauna species that will be directly disturbed.	Project Manager Contractor	A site walk through is recommended by a suitably qualified ecologist or ECO prior to any construction activities. The area must be walked though prior to construction to ensure no avifaunal species remain in the habitat and get killed.	Construction	Project Manager Contractor	Ongoing	Proof of appointment of the qualified specialist and suitably experienced Environmental officer

	Contractor Environmental Officer (cEO)	Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated.		contractor Environmental Officer (cEO)		
A qualified environmental control officer must be on site when construction begins.	Contractor Environmental Officer (cEO) Contractor	A site walk through is recommended by a suitably qualified ecologist or Environmental Officer prior to any construction activities. Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated. Should any large nests be observed within the project area construction should stop immediately and a qualified specialist must be contacted.	Construction Phase	Project Manager Contractor contractor Environmental Officer (cEO)	Ongoing	Proof of appointment of the qualified specialist and suitably experienced Environmental officer
Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances nocturnal avifauna.	Contractor Contractor Environmental Officer (cEO) Project Manager	Ensure that noise limits do not exceed acceptable limits and avoid the use of amplification communication	Construction	Project Manager Contractor Developer Site Supervisor (DSS)	Ongoing	No complaints registered in this regard. No amplification equipment is used.

No trapping, killing, or poisoning of any avifauna is to be allowed	Project Manager Contractor Foreman	All site staff must be informed of this requirement during the Environmental Awareness Training and the consequences of not adhering to the requirement.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	Project Manager Contractor Contractor Environmental Officer (cEO)	Ongoing	No instances of deliberate or intentional killing is reported
The duration of the construction should be minimized to as short term as possible, to reduce the period of disturbance on avifauna	Project Manager Contractor	Project timelines for construction activities within high biodiversity areas are to be minimized as far as possible. Earthworks during construction phase are to be conducted during the dry season.	Construction Phase	Project Manager Contractor Environmental Officer (cEO)	Ongoing	As per project timelines.
The footprint area of the substation must be kept to a minimum.	Contractor Environmental Officer (cEO) Contractor Developer's Project Manager	The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas; Infrastructure must be consolidated where possible in order to minimise the amount of ground and air space used. Earthworks during construction phase are to be conducted during the dry season.	Planning and construction	Environmental Officer & Contractor Engineer Contractor Environmental Officer (cEO)	During Planning and construction Phase	Monitor and implement the methods of minimising the impacts.
Any exposed parts must be covered (insulated) to reduce electrocution risk	Environmental Officer & Contractor	Implement and maintain insulation on cables. All the parts of the infrastructure must be nest proofed and anti-perch	Planning and construction	Environmental Officer & Contractor	During Planning and construction Phase	Photographic record of the implementation and maintenance

	Engineer	devices placed on areas that can lead to electrocution.		Engineer Contractor Environmental Officer (cEO)		
Ideally, construction within 500m of the existing Verreaux's Eagle nest should be conducted between January and April outside the breeding period of Verreaux's eagles (note that stringing of the 400kV turn-ins may extend into May). However, if this is not possible specified mitigations need to be put in place for construction to continue within the 500m buffer.	Environmental Officer & Contractor Engineer Avifauna Specialist to monitor	Specified mitigations to be put in place for construction to continue within the 500m buffer: • Construction of an artificial nesting platform as soon as April-June 2023 to encourage them to move their current breeding location. • The construction of the artificial nesting platform and location of the platform must be undertaken in consultation with a suitably qualified Avifaunal Specialist. • Implementing a scientifically sound monitoring program to determine the level of disturbance during construction, only if eagles utilise their current nesting location in close proximity to the substation. • A suitably qualified Avifaunal Specialist must be appointed to undertake the monitoring.	Planning and construction	Environmental Officer & Contractor Engineer Avifauna Specialist to monitor	During Planning and construction Phase	I Evidence of artificial nesting platform constructed. Evidence of monitoring program implemented
Management Outcome: Environmental Awareness Training						

All personnel to undergo Environmental Awareness Training.	Project Manager Health and Safety Officer Contractor Contractor Environmental Officer	Hold environmental awareness training workshops. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of species, their identification, conservation status and importance, biology, habitat requirements and management requirements within the Environmental Authorisation and the EMPr.	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase Life of Operation	Project Manager Contractor Contractor Environmental Officer	As needed	Attendance register and training minutes / notes for the record

8.4 *Aquatic Ecology (Freshwater Impacts)*

Impact management outcome: Potential impact on aquatic (freshwater) resources						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas.	Developer's Project Manager Contractor Environmental Officer (cEO)	All construction areas within should be clearly demarcated. The footprint area must be aligned with the existing road/railway reserves wherever possible. Disturbed areas should be sought as the preferred alignment area. Where feasible all access roads should use existing farm roads before new roads are constructed	Construction, operation and decommissioning phase	ECO	Before commencement and Ongoing	Evidence as per ECO reporting.

The stormwater must be managed as part of the plan for the existing Gamma substation.	Developer's Project Manager, Contractor Environmental Officer	An appropriate stormwater management plan must be developed	Design Phase, Construction Phase, Operational Phase, Decommissioning Phase	Project Manager, ECO	Before commencement and Ongoing	Monitor and implement the methods of minimising the impacts. Implementation of erosion control measures. Evidence as per ECO reporting.
Ensure that pollution of water sources does not take place and effective management actions are in place to protect the water sources during the operational phase.	Developer's Project Manager dEO Contractor Environmental Officer (cEO)	The infrastructure footprint areas must avoid the delineated water resources and adhere to the prescribed buffer areas. Vehicles and equipment required for the suspension of cables across watercourses are permitted to access the buffer areas, but may not intrude into the delineated watercourses.	Design and Planning	dEO Contractor Environmental Officer (cEO)	Once off during design.	No evidence of water contamination resulting from the said activities. Evidence as per ECO reporting.
Minimize disturbance to watercourses as practicably possible (with the exception of construction of watercourse crossings).	Project Manager Contractor	The infrastructure footprint areas must avoid the delineated water resources and adhere to the	Construction and decommissioning phase	ECO	Before commencement and Ongoing	Evidence as per ECO reporting.

	Contractor Environmental Officer (cEO)	prescribed buffer areas.				
Manage increase in sedimentation and erosion during the construction, operational and decommissioning phase	Project Manager ECO	Preferential flow paths should be identified that intersect with new roads so that silt traps and fences can be installed to avoid siltation of watercourses	Construction, operation and decommissioning phase	ECO	Before commencement and Ongoing	Monitor and implement the methods of minimising the impacts. Evidence as per ECO reporting.
Management of stormwater and discharge from the facility, to avoid scouring of the receiving area.	Environmental Officer (cEO) Contractor Developer's Project Manager	An appropriate stormwater management plan must be developed for all substations.	Lifespan of the project	Environmental Officer Contractor Developer Site Supervisor (DSS)	Before commencement and Ongoing	Monitor and implement the methods of minimising the impacts. Evidence as per ECO reporting. Implementation of erosion control measures.
Existing servitudes, access routes, and especially roads must be made use of.	Environmental Officer & Design Engineer	Where feasible all access roads should use existing farm roads before new roads are constructed.	Construction/Operational Phase	Environmental Officer & Design Engineer	Ongoing	Evidence as per ECO reporting.

8.5 *Heritage & Palaeontological Impacts.*

Impact management outcome: Reduce impact on heritage & palaeontological resources						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA	Applicant Environmental Manager or ECO Heritage Specialist	The ECO must be trained and familiar with the implementation of the Chance Find Fossil Procedure. If any evidence of archaeological sites or remains (e.g., remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA (**Natasha Higgitt 021 202 8660**) must be alerted as per section 35(3) of the NHRA. **Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule**. Fossil discoveries ought to be protected and the ECO/site manager must report to South African Heritage Resources	Construction and operation phases	ECO	Monthly/ as or when required	ECO Monthly Checklist/Report The Chance Find Fossil Procedure must be implemented, and all findings must be reported accordingly.

		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) so that mitigation (recording and collection) can be carried out. The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates. A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates. Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found. Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or				

		rescue collection by a palaeontologist is necessary. Excavation of this fossil heritage will require a permit from the South African Heritage Resource Agency (SAHRA) and the material must be housed in a permitted institution. The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sandbags. The Heritage agency will also be able to advise on the most suitable method of protection of the find. In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site. Once Heritage Agency has issued the written authorization, the developer may continue with the				

		development on the affected area. All fieldwork and reports should meet the minimum standards for palaeontological impact studies developed by SAHRA.				
The *Chance Find Protocol* must be implemented by the ECO or site manager in charge of these developments.	Applicant Environmental Manager or ECO Heritage Specialist	Implement chance find procedures in case where possible heritage finds are uncovered. Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34-36 and 38 of NHRA A professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA. Fossil discoveries ought to be protected and the ECO/site	Construction and operation phases	ECO	Monthly/ as or when required	ECO Monthly Checklist/Report The Chance Find Fossil Procedure must be implemented, and all findings must be reported accordingly.

		manager must report to South African Heritage Resources 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) so that mitigation (recording and collection) can be carried out. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (**Thingahangwi Tshivhase/Ngqabutho Madida 012 320 8490**), must be alerted immediately as per section 36(6) of the NHRA. **Non-compliance with section of the NHRA is an offense in terms of section 51(1)e of the NHRA and item 5 of the Schedule**				
Retain/re-establish and maintain natural vegetation immediately adjacent to the development footprint/servitude. Maintain the general appearance of the development as a whole.	Applicant EO Heritage Specialist	Ensure compliance with relevant legislation and recommendations under Section 36 and 38 of NHRA	Construction phase Planning phase	EO	Monthly/ as or when required	EO Monthly Checklist/ Report

Remove infrastructure not required for the post-decommissioning use. Rehabilitate all affected areas. Consult an ecologist regarding rehabilitation specifications.	Applicant ECO Heritage Specialist	Ensure compliance with relevant legislation and recommendations under Section 36 and 38 of NHRA	Decommissioning phase	ECO	Monthly / as or when required	EO Monthly Checklist/Report
If fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the Chance Find Protocol must be implemented by the ECO or site manager in charge of these developments.	Applicant ECO Heritage Specialist	The ECO must be trained and familiar with the implementation of the Chance Find Fossil Procedure. Fossil discoveries ought to be protected and the ECO/site manager must report to South African Heritage Resources 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) so that mitigation (recording and collection) can be carried out.	During construction and operation	Applicant ECO Heritage Specialist	Monthly / as or when required	The Chance Find Fossil Procedure must be implemented, and all findings must be reported accordingly.
Should an archaeological site or cultural material be discovered during construction (or operation), the area should be demarcated, and construction activities that may impact the find must be halted.	Contractor in consultation with Heritage Specialist/ Archaeologist	All work must cease in the immediate area and reported to the Heritage Western Cape or SAHRA. An appropriately qualified heritage practitioner/archaeologist must be identified to be called upon if	During Construction phase	ECO	Weekly, and as and when required during the construction.	Activities to be monitored by the ECO in compliance with the EMPr and conditions of the EA

		any possible heritage resources or artefacts are identified. If heritage resources are uncovered during the course of the development, a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contracted as soon as possible to inspect the heritage resource. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required subject to permits issued by SAHRA.				

8.6 *Visual Impacts*

Impact management outcome: Reduce potential impact on visual aspects						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
Retain/re-establish and maintain natural vegetation in all areas immediately adjacent to the development footprint/servitude. This measure will help to soften the appearance of the infrastructure within its context.	cEO and Contractor	Demarcate areas of indigenous vegetation to be avoided before clearance is undertaken. Make use of indigenous species for rehabilitation.	Construction and operation (i.e., for maintenance purposes)	ECO Operation and maintenance team	Weekly, and as and when required	No unnecessary clearance of indigenous vegetation is undertaken. Proof of mitigation in accordance with the listed requirements
The rehabilitation and stabilisation by vegetation of all new landforms e.g., platform side slopes, road fill or cut slopes must be done as soon as the forms are complete.	cEO and Contractor	The monitoring and management of the vegetation programme is important to ensure that problems (erosion, die back, lack of grass cover) are identified early so that corrective measures can be taken.	Construction and operation (i.e., for maintenance purposes)	ECO Operation and maintenance team	Weekly, and as and when required	Proof of mitigation in accordance with the listed requirements
Mitigation of visual impacts associated with the construction phase, albeit temporary, would entail proper planning, management and rehabilitation of the construction site.	cEO and Contractor	Ensure that vegetation is not unnecessarily cleared or removed during the construction period. Plan the placement of laydown areas (if required) and any potential temporary construction camps in order to minimise	Construction and operation (i.e., for maintenance purposes)	ECO Operation and maintenance team	Weekly, and as and when required	No unnecessary clearance of indigenous vegetation is undertaken. Proof of mitigation in accordance with the listed requirements

		vegetation clearing (i.e., in already disturbed areas) wherever possible. Restrict the activities and movement of construction workers and vehicles to the immediate construction area and 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. Rehabilitate all disturbed areas, construction areas, roads, slopes etc. immediately after the completion of construction works. If necessary, an ecologist must be consulted to assist or give input into rehabilitation specifications. Make use of indigenous species for rehabilitation. During operation, the maintenance of the grid connection infrastructure will ensure that the infrastructure does not degrade, therefore aggravating visual impact.				
Roads must be maintained to forego erosion and to suppress dust, and rehabilitated areas must be monitored for rehabilitation failure. Remedial actions must	Developer's Project Manager Contractor	Implement requirements as listed	Operational	Operations and maintenance contractor	On going.	Photographic evidence and visual inspection

be implemented as a when required.	dEO			dEO		
Once the grid connection infrastructure has exhausted its life span, all associated infrastructure not required for the post rehabilitation use of the site/servitude should be removed and all disturbed areas appropriately rehabilitated. An ecologist should be consulted to give input into rehabilitation specifications. All rehabilitated areas should be monitored for at least a year following decommissioning, and remedial actions implemented as and when required.	cEO and Contractor	Make use of indigenous species for rehabilitation.	Decommissioning Phase	ECO and maintenance team	When required	Proof of mitigation in accordance with the listed requirements
Mitigation of other lighting impacts includes the pro-active design, planning and specification lighting for the facility. The correct specification and placement of lighting and light fixtures will go far to	Project Manager Contractor Developer Environmental Officer (dEO)	Shielding the sources of light by physical barriers (walls, vegetation, or the structure itself) Limiting mounting heights of lighting fixtures, or alternatively using footlights or bollard level lights	Operation	Operations and maintenance contractor dEO	On going.	Photographic evidence and visual inspection

contain rather than spread the light.	contractor Environmental Officer (cEO)	Making use of minimum lumen or wattage in fixtures Making use of down-lighters, or shielded fixtures Making use of Low-Pressure Sodium lighting or other types of low impact lighting Making use of motion detectors on security lighting. This will allow the site to remain in relative darkness, until lighting is required for security or maintenance purposes.				

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 2: CURRICULA VITAE

Kikuyu Waterfall
Cnr. Old Pretoria Main Road & Maxewell Drive
Johannesburg, South Africa

Email: arlene@veersgroup.com
Tel: +278 277 7074

CURRICULUM VITAE OF ARLENE SINGH

Profession: Environmental Assessment Practitioner (EAP) / Director

Specialisation: Environmental Assessments, report writing, report reviewing, development of project proposals for procuring new projects and project administration.

Work Experience: 10 years' experience in Environmental Assessments and 1 year in Sustainability Consulting.

VOCATIONAL EXPERIENCE

Professional execution of consulting services for projects in the environmental management field, specialising in Environmental Impact Assessment studies, environmental permitting, public participation, compilation of Environmental Management Plans and Programmes, environmental policy, and integrated environmental management. Responsibilities include report writing, project management, review of specialist studies and the identification and assessment of potential negative environmental impacts and benefits. Compilation of the reports for environmental studies is in accordance with all relevant environmental legislation.

Experience in conducting environmental impact assessments for infrastructure development projects (roads, stormwater, pipelines), Mixed Use Developments and Section 24G Applications for complex projects. She has extensive experience in managing and monitoring ECO functions and compliance on relevant projects. She has gained the ability to conduct sustainability assurance audits for non-financial environmental KPI's through her experience with listed mining corporations.

SKILLS BASE AND CORE COMPETENCIES

- Compilation of environmental impact assessment reports and environmental management programmes in accordance with relevant environmental legislative requirements;
- Identification and assessment of potential negative environmental impacts and benefits through the review of specialist studies;
- Key experience in the assessment of impacts associated with complex Section 24G Applications.
- Review of environmental impact assessment reports, impacts matrices and environmental management programme reports;
- Conducting of ECO audits, managing ECO staff, review of ECO reports and liaison with the client;
- Review of Carbon Footprint Analysis report and provision of recommendations for industry;
- Developing Business Development Plans, action plans and carrying out Business Development initiatives;
- Compilation of Integrated Reports in line with King IV;
- Conducting Mining Permit Applications with the DMR and the associated Basic Assessment process in line with the MPRDA;
- Extensive experience in compilation and submission of Tenders and Proposals;

EDUCATION AND PROFESSIONAL STATUS

Degrees:

- B.Sc. (Hons.) Environmental Management (2016), University of South Africa (UNISA);
- B.Sc. Environmental Science (2012), University of Kwa-Zulu Natal, Westville

Short Courses:

- Official DWS Section 21 (c) and (i) Water Use Authorisation Course (2018)- Dr Wietsche Roets, Specialist Scientist: (In Stream Water Use);
- SMME Green Building Face to Face Workshop (2018)- GBCSA hosted by JP Morgan;
- ArcGISBasic 10,3 (2016)- Esri South Africa
- Energy within Environmental Constraints (2020)- Harvard (Online)
- Becoming an Entrepreneur (2020)- Massachusetts Institute of Technology (Online)

Professional Society Affiliations:

- South African Council for Natural Scientific Professionals - Professional Natural Scientist: Environmental Scientist) – Reg No. 118872
- Environmental Assessment Practitioners Association of South Africa- Reg No: 2019/898

Other Relevant Skills:

- Compiling and submission of invoices on projects;
- Registration of Waste Management Facilities on GWIS

EMPLOYMENT

Date	Company	Roles and Responsibilities
16 December 2020- Current	Nala Environmental (Pty) Ltd	Environmental Assessment Practitioner / Director *Tasks include:* *Compilation of Environmental Impact Assessment (EIA) reports; Basic Assessment (BA) reports and Environmental Management Programmes; Environmental Screening reports; Co-ordination of the public participation process; Project management; project proposals and tenders; Client liaison and Marketing; Process EIA Applications. Business Development, Integrated reporting. Strategy, policy and procedure*

Date	Company	Roles and Responsibilities
		development. Planning of staff on engagements and Invoicing of clients.
08 April 2019- 15 December 2020:	Savannah Environmental (Pty) Ltd	Environmental Assessment Practitioner *<u>Tasks include</u>:* *Compilation of Environmental Impact Assessment (EIA) reports; Basic Assessment (BA) reports and Environmental Management Programmes; Environmental Screening reports; Co-ordination of the public participation process; Project management; project proposals and tenders; Client liaison and Marketing; Process EIA Applications.*
01 January 2016- 05 April 2019	Triplo4 Sustainable Solutions (Pty) Ltd	Environmental Consultant/Gauteng Office Manager *<u>Tasks included:</u>* *Review of Basic Assessment reports, Environmental Management Programme reports, Impact Matrices. Review of Environmental Control Officer functions, report and planning of site visits. Compiling Waste Management License Applications and Section 24G Application with reports for review by company Director. Review of specialist reports. Compilation of tenders, proposals and fee proposals. Co-ordinate public participation processes. Liaison with clients, stakeholders and competent authorities. Business Development, Integrated reporting. Strategy, policy and procedure development. Planning of staff on engagements and Invoicing of clients.*
01 October 2014 – 31 December 2015	PricewaterHouse Coopers (PwC)	Sustainability Consultant 2 *<u>Tasks included:</u>* *Non-financial auditing of Environmental KPI's (Primary water, Total Waste, Total Electricity, Total CDP Calc, Scope 1, 2 and 3 emissions, Total CSI spend, Total Environmental incidents and Total Rock waste generated) for listed mining companies. Role included, testing of controls, applications of audit standards and guidelines, preparation and conclusions of audit papers and files, reporting to management and preparation of audit reports.*

Date	Company	Roles and Responsibilities
01 January 2013- 30 September 2014	Triplo4 Sustainable Solutions (Pty) Ltd	Junior Environmental Consultant *Tasks included:* *Conducting Environmental Control Officer audits and drafting of ECO reports for review. Drafting of Basic Assessment (BA) reports, Environmental Management Programme reports for review by Environmental Consultant. Conducting public participation by liaison with competent authorities and stakeholders. Assisting with compiling of Basic Assessment documents.*

PROJECT EXPERIENCE

Arlene has extensive experience in conducting environmental impact assessments for infrastructure development projects (roads, stormwater, pipelines) and renewable energy projects (solar, wind, csp and hybrid projects), Mixed Use Developments and Section 24G Applications for complex projects and housing developments. She has extensive experience in managing and monitoring ECO functions and compliance on relevant projects. She has gained the ability to conduct sustainability assurance audits for non-financial environmental KPI's through her experience with listed mining corporations. She has also been involved in undertaking Part 2 Amendment Applications and impact assessments for Renewable Energy Projects in South Africa. She currently manages staff and undertakes project planning to ensure that projects are executed within the appropriate timeframes and within budget.

MINING SECTOR PROJECTS

Environmental Impact Assessments and Environmental Management Programmes

Project Name & Location	*Client Name*	*Role*
Yzermyn Coal Mine EMPr, Piet Retief, Mpumalanga	*Atha Group*	*EAP*

Basic Assessments

Project Name & Location	*Client Name*	*Role*
Shaya Quarry Basic Assessment process, Empangeni, Kwazulu-Natal	*Mbavuza Minerals*	*Project Manager*
Umvoti River Sand Mining Basic Assessment process, Kwazulu-Natal	*Izimbiwe Minerals Pty Ltd*	*Project Manager*

Environmental Permitting, S53, Water Use Licence (WUL), Waste Management Licence (WML) & Other Applications

Project Name & Location	*Client Name*	*Role*

Shaya Quarry Mining Permit Application, Empangeni, Kwazulu-Natal	*Mbavuza Minerals*	*Project Manager*
Umvoti River Sand Mining Mining Permit Application, Kwazulu-Natal	*Izimbiwe Minerals Pty Ltd*	*Project Manager*
Newark Quarry, Ilembe Municipality, Kwazulu-Natal	*iLembe Concrete Pty Ltd*	*Junior EAP*

INFRASTRUCTURE DEVELOPMENT PROJECTS (BRIDGES, PIPELINES, ROADS, WATER RESOURCES, STORAGE, ETC)

Basic Assessments

Project Name & Location	***Client Name***	***Role***
Replacement of Nseleni Bridge- Empangeni, Kwazulu-Natal	*RHDHV*	*EAP*
Construction of the 60ML Ntuzuma Reservoir, Ntuzuma, Kwazulu-Natal	*eThekwini Metropolitan Municipality*	*Project Manager*
Upgrade of the Nyathikazi box culvert, Darnell, Kwazulu-Natal	*KwaDukuza Municipality*	*Junior EAP*
Upgrade and Expansion Provincial Main Road D887, Kwazulu-Natal	*RHDHV*	*Junior EAP*
Expansion of LOX and Diesel Storage at the Air Products Facility in Coega, Eastern Cape	*Air Products South Africa (Pty) Ltd*	*EAP*

Environmental Compliance, Auditing and ECO

Project Name & Location	***Client Name***	***Role***
ECO Monitoring for Construction of Offtake 1 Reservoir, KwaDukuza, Kwazulu-Natal	*KwaDukuza Municipality*	*Project Manager*
ECO Monitoring for Construction of Offtake 6A2, 6D, 8C, 8D, 9, 11D Pipelines, KwaDukuza, Kwazulu-Natal	*KwaDukuza Municipality*	*Project Manager*
ECO Monitoring for the Construction of the Jozini RCWSS Phase 1A, Jozini, Kwazulu-Natal	*RHDHV*	*ECO (1 year), Project Manager*
ECO Monitoring for the Greytown BWSS, Greytown, Kwazulu-Natal	*RHDHV*	*Project Manager*
ECO Monitoring for the Kranskop Water Supply Scheme, Kranskop, Kwazulu-Natal	*RHDHV*	*ECO*
ECO Monitoring for the Zulti South Access Road, Richards Bay, Kwazulu-Natal	*RHDHV*	*Project Manager*

Compliance Advice and ESAP reporting

Project Name & Location	***Client Name***	***Role***
Ethafeni Cemetery Environmental Assessment Report, KwaDukuza, Kwazulu-Natal	*KwaDukuza Municipality*	*EAP*

Environmental Permitting, S53, Water Use Licence (WUL), Waste Management Licence (WML) & Other Applications

Project Name & Location	***Client Name***	***Role***
General Authorisation for the Replacement of the Nseleni Bridge, Empangeni, Kwzulu-Natal	*RHDHV*	*EAP*
Water Use Licence Amendment for Country Club Johannesburg	*Country Club Johannesburg*	*EAP*

HOUSING AND URBAN PROJECTS

Environmental Impact Assessments and Environmental Management Programmes

Project Name & Location	***Client Name***	***Role***
Ethafeni Precinct Project Section 24G Application- Groutville , Kwazulu- Natal.	*KwaDukuza Municipality*	*Project Manager/Lead Consultant*
Environmental Management Programme report Brettenwood Residential Development, Kwazulu-Natal.	*Brettenwood Coastal Estate*	*EAP*
Environmental Management Programme report for CTM Ballito, Ballito, Kwazulu-Natal	*CTM*	*EAP*

Basic Assessments

Project Name & Location	***Client Name***	***Role***
Upgrade of residential dwelling on Colwyn Drive, Salt Rock, Kwazulu-Natal	*Mike Graham*	*Junior EAP*
Ethafeni Precinct Project Basic Assessment, Groutville, Kwazulu-Natal	*KwaDukuza Municipality*	*Project Manager*
105 Nkwazi Drive Single Residential House Basic Assessment, Zinkwazi, Kwazulu-Natal	*Ituwiz Pty Ltd*	*Project Manager*

Environmental Compliance, Auditing and ECO

Project Name & Location	***Client Name***	***Role***
88 Compensation ECO Audits – Ballito, Kwazulu- Natal	*Imali Corp*	*Environmental Control Officer (ECO)*
Oceans Umhlanga Hotel & Residential Development, Umhlanga, Kwazulu-Natal	*Edison Property Group*	*Project Manager*
Inoxa Cookware Factory Warehouse, Woodmead Estate, Shakaskraal, Kwazulu-Natal	*Shree Property*	*Project Manager*
Woodmead Estate Warehousing, Gauteng	*Shree Property*	*Project Manager*
Ridgeside Commercial Development, Umhlanga, Kwazulu-Natal	*Shree Property*	*Project Manager*

Construction of Jozini Shopping Centre, Jozini, Kwazulu-Natal	*GK Projects*	*ECO*
Birdhaven Residential Development, Ballito, Kwazulu-Natal	*Mike Graham Trust*	*ECO*
Foxhill Church and Residential Development, Ballito, Kwazulu-Natal	*M&C Janigh Trust*	*ECO*
Beema Bamboo Plantation Site (Bamboo to Energy project, Kwazulu-Natal	*Green Grid Energy*	*ECO*

OTHER PROJECTS

Environmental Compliance, Auditing and ECO

Project Name & Location	***Client Name***	***Role***
Beema Bamboo Plantation Site (Bamboo to Energy project, Kwazulu-Natal	*Green Grid Energy*	*ECO*
Mkondeni Medical Waste External Waste Management License Audit , Pietermaritzburg	*Ecocyle Waste Solutions*	*Auditor*
Dube Tradeport External Audit, eThekwini	*Dube Tradeport Corporation*	*Junior Auditor*

Carbon Footprint Analysis

Project Name & Location	***Client Name***	***Role***
Carbon footprint analysis of Newcastle and Sasolburg Plants, (Kwazulu Natal & North West	*Karbochem Pty Ltd*	*EAP*
Measure Carbon Emissions and provide updated baseline that would enable DTPC to quantify, monitor and assess carbon footprint and its climate change impact for DTPC, eThekwini	*Dube Tradeport Corporation*	*Junior EAP*

Waste Management

Project Name & Location	***Client Name***	***Role***
Waste Classification Assessment for Karbochem Newcastle facility , Kwazulu-Natal	*Karbochem Pty Ltd*	*EAP*
Waste Management Licenses for Wadeville & Rosslyn Waste Management Facilities, Gauteng.	*Planet Care Pty Ltd*	*EAP*

Compliance Advice and ESAP reporting

Project Name & Location	***Client Name***	***Role***

Environmental Opinion and Enquiry for the Rosslyn Tyre Pyrolysis Plant, Gauteng	*Cosmic Energy*	*EAP*

Non-Financial Auditing

KPI'S Audited	***Client Name & Location***	***Role***
Total Primary Water Use, Total Electricity Used, Total Waste Generated, Scope 1, 2 & 3 Emissions and Total Number of Environmental Incidents.	*Anglo Platinum (South Africa)*	*Sustainability Consultant*
Total Primary Water Use, Total Waste Generate and Total Number of Environmental Incidents.	*De Beers (Namibia)*	*Sustainability Consultant*
Scope 1, 2 & 3 Emissions, Total Electricity Purchased, Total Primary Water Used.	*Harmony Gold (South Africa)*	*Sustainability Consultant*
Scope 1, 2 & 3 Emissions, Total Electricity Purchased, Total Primary Water Used and Total Rock Waste Generated.	*Exxaro (South Africa, Papua New Guinea)*	*Sustainability Consultant*
Total Corporate Social Investment fund spend by Barclays Group	*Barclays Group*	*Sustainability Consultant*
Audit Environmental and Social Risk Finance Projects - Equator Principles	*MTN (South Africa & Nigeria)*	*Sustainability Consultant*

Renewable Energy Projects

Part 2 Amendment Applications and Motivation Reports

Project Name & Location	***Client Name***	***Role***
Transalloys Coal-Fired Power Station near Emalahleni, Mpumalanga Province	*Transalloys (Pty) Ltd*	*EAP*
Zen Wind Energy Facility, Western Cape	*Energy Team (Pty) Ltd*	*EAP*
Hartebeest Wind Energy Facility, Western Cape	*juwi Renewable Energies (Pty) Ltd*	*EAP*
Khai-Ma and Korana Wind Energy Facilities	*Mainstream Renewable Power (Pty) Ltd*	*EAP*
Korana Solar PV facility	*Mainstream Renewable Power (Pty) Ltd*	*EAP*
Sutherland Wind Energy Facility	*Mainstream Renewable Power (Pty) Ltd*	*EAP*
Rietrug Wind Energy Facility	*Mainstream Renewable Power (Pty) Ltd*	*EAP*

Basic Assessments

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*	*EAP*
Kolkies and Sadawa PV facilities and associated grid infrastructure	*Mainstream Renewable Power South Africa (Pty) Ltd*	*EAP*
Hyperion Overhead Powerline	*Red Rocket (Pty) Ltd*	*EAP*
132KkV Phinda Power underground transmission line	*Phinda Power Producers (Pty) Ltd*	*EAP*
Msenge Emoyeni Wind Energy Facility supporting infrastructure	*Windlab (Pty) Ltd*	*EAP*
Sutherland Wind Energy Facility Grid Infrastructure	*Mainstream Renewable Power South Africa (Pty) Ltd*	*EAP*
Rietrug Wind Energy Facility Grid Infrastructure	*Mainstream Renewable Power South Africa (Pty) Ltd*	*EAP*
Emoyeni Grid Infrastructure for the Emoyeni Wind Energy Facilities	*ACED*	*EAP*
Msenge Emoyeni 88kV Powerline and On-site Substation	*ACED*	*EAP*
Waaihoek 66kV Powerline and On-site Substation	*Mainstream Renewable Power South Africa (Pty) Ltd*	*EAP*

Finalisation of the EMPr and Layout

Project Name & Location	*Client Name*	*Role*
Msenge Emoyeni Wind Energy Facility	*ACED*	*EAP*
Iziduli Emoyeni Wind Energy Facility	*ACED*	*EAP*
Umsinde Emoyeni Wind Energy Facility	*ACED*	*EAP*
Khangela Emoyeni Wind Energy Facility	*ACED*	*EAP*
Sutherland Wind Energy Facility	*Mainstream Renewable Power South Africa (Pty) Ltd*	*EAP*
Rietrug Wind Energy Facility	*Mainstream Renewable Power South Africa (Pty) Ltd*	*EAP*
Sutherland 2 Wind Energy Facility	*Mainstream Renewable Power South Africa (Pty) Ltd*	*EAP*

Environmental Impact Assessments

Project Name & Location	*Client Name*	*Role*
Upilanga Solar Park, Northern Cape (350MW CSP Tower)	*Emvelo Capital Projects (Pty) Ltd*	*EAP*
350MW Risk Mitigation Power Plant (Gas to Power facility)	*Phinda Power Producers (Pty) Ltd*	*EAP*
75mw Thermal Dual Fuel Facility and associated infrastructure (Hybrid facility i.e. gas to power and solar pv)	*Red Rocket (Pty) Ltd*	*EAP*

Berg River Wind Energy Facility	*Energy Team (Pty) Ltd*	*EAP*

Section 54 Audits

Project Name & Location	***Client Name***	***Role***
Mulilo 20MW PV Facility, Prieska, Northern Cape	*Mulilo (Pty) Ltd*	*Auditor*
Mulilo 10MW PV Facility, De Aar, Northern Cape	*Mulilo (Pty) Ltd*	*Auditor*
Karoshoek CSP I Facility/ Solar One,, Upington, Northern Cape	*Karoshoek Solar One (Pty) Ltd*	*Audit*

APPENDIX 3: CHANCE FIND FOSSIL PROCEDURE

- If a chance find is made the person responsible for the find must immediately **stop working** and all work that could impact that finding must cease in the immediate vicinity of the find.
- 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 ESO or site manager. The ESO or site manager must report the find to the relevant 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 coordinates.
- If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA (Natasha Higgitt 021 202 8660) must be alerted as per section 35(3) of the NHRA or Heritage Western Cape.
- If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Ngqabutho Madida 012 320 8490), must be alerted immediately as per section 36(6) of the NHRA
- A preliminary report must be submitted to the Heritage Agency within **24 hours** of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates.
- Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found.
- Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary.
- The site must be secured to protect it from any further damage. **No attempt** should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find.
- In the event that the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO (site manager). Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site.
- Once the Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.

APPENDIX 4: STORMWATER MANAGEMENT & EROSION MANAGEMENT PLAN

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 Storm Water and Erosion Management Plan are closely linked to one another and should be managed together.

This Storm Water & Erosion Management Plan addresses the management of storm water runoff and erosion from the development footprint and significant impacts relating to resultant impacts such as soil erosion and downstream sedimentation. The main factors influencing the planning of storm water management measures and infrastructure are:

» Topography and slope gradients;
» Placing of infrastructure and infrastructure design;
» Annual average rainfall; and
» Rainfall intensities.

The objective of the plan is, therefore, to provide measures to address runoff from disturbed portions of the development footprint, 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 various infrastructure if not necessary.
» Do not divert flows out of their natural flow pathways, thus depriving downstream watercourses of water.

This Storm Water & Erosion Management Plan must be updated and refined once the construction/ civil engineering plans have been finalised following detailed design.

2. STORMWATER MANAGEMENT PRINCIPLES

In the design phase, various storm water management principles should be considered including:

» Prevent concentration of storm water flow at any point where the ground is susceptible to erosion.
» Reduce storm water flows as far as possible by the effective use of attenuating devices (such as swales, berms, silt fences). As construction progresses, the storm water 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 exposure of bare soils to minimise the erosive forces of wind, water and all forms of traffic.
- » Ensure that development does not increase the rate of storm water flow above that which the natural ground can safely accommodate at any point in the sub-catchments.
- » Ensure that all storm water control works are constructed in a safe and aesthetic manner in keeping with the overall development.
- » Plan and construct storm water 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 storm water flow should not exceed the capacity of the culvert. To assist with the storm water run-off, gravel roads should typically be graded and shaped with a 2-3% crossfall back into the slope, allowing storm water to be channelled in a controlled manner towards the, natural drainage lines and to assist with any sheet flow within the development footprint.
- » Design culvert inlet structures to ensure that the capacity of the culvert does not exceed the pre-development storm water flow at that point. Provide detention storage on the road and/or upstream of the storm water 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 storm water 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 storm water system.
- » Preferably all drainage channels on site 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. EROSION MANAGEMENT PRINCIPLES

Topsoil

Prior to construction, the topsoil areas to be disturbed should be stripped to a depth to be confirmed by the engineer and set aside for spreading to all areas to be reinstated after the construction. Temporary topsoil stockpiles must be covered with net or shade cloth to protect them. Once all grades have been finalised and prepared, topsoil should be spread evenly to all areas to be re-vegetated.

Erosion and sedimentation control

1. During construction the Contractor shall protect areas susceptible to erosion by installing necessary temporary and permanent drainage works as soon as possible and by taking other measures necessary to prevent the surface water from being concentrated in streams and from scouring the slopes, banks or other areas.
2. A Method statement shall be developed and submitted to the Engineer to deal with erosion issues prior to bulk earthworks operations commencing.
3. Any erosion channels developed during the construction period or during the vegetation establishment period shall be backfilled and compacted and the areas restored to a proper condition.
4. Stabilisation of cleared areas to prevent and control erosion shall be actively managed. The method of stabilisation shall determine in consultation with the ECO. Consideration and provision shall be made for the following methods (or combination):

a) Brush cut packing
b) Mulch or chip cover
c) Straw stabilising
d) Watering
e) Planting/sodding
f) Hand seed-sowing
g) Hydroseeding
h) Soil binders and anti-erosion compounds
i) Mechanical cover or packing structures
i. Gabions & mattresses
ii. Geofabric
iii. Hessian cover
iv. Armourflex
v. Log/ pole fencing
vi. Retaining walls

5. Traffic and movement over stabilised areas shall be restricted and controlled and damage to stabilised areas shall be repaired and maintained to the satisfaction of the ECO.
6. Anti-erosion compounds shall consist of all organic or inorganic material to bind soil particles together and shall be a proven product able to suppress dust and erosion. The application rate shall conform to the manufacturer's recommendations. The material used shall be of such a quality that indigenous seeds may germinate and not prohibit growth.

Blasting

1. A current and valid authorisation shall be obtained from the relevant authorities and copied to the Engineer prior to any blasting activity.
2. A Method Statement shall be required for any blasting related activities.
3. All Laws and Regulations applicable to blasting activities shall be adhered to at all times.
4. A qualified and registered blaster shall supervise all blasting and rock splitting operations at all times.
5. The Contractor shall ensure that appropriate pre blast monitoring records are in place (i.e. photographic and inspection records of structures in close proximity to the blast area.)

6. The Contractor shall allow for good quality vibration monitoring equipment and record keeping on site at all times during blasting operations.
7. The Contractor shall ensure that emergency services are notified, in writing, a minimum of 24 hours prior to any blasting activities commencing on site.
8. The Contractor shall take necessary precautions to prevent damage to special features and the general environment, which includes the removal of fly-rock. Environmental damage caused by blasting / drilling shall be repaired at the Contractor's expense to the satisfaction of the Engineer.
9. The Contractor shall ensure that adequate warning is provided immediately prior to all blasting. All signals shall also be clearly given.
10. The contractor shall use blast mats for cover material during blasting. Topsoil may not be used as blast cover.
11. During demolition the Contractor shall ensure, where possible that trees in the area are not damaged.
12. Appropriate blast shaping techniques shall be employed to aid in the landscaping of blast areas, and a Method Statement to be approved by the Engineer, shall be required in this regard.
13. At least one week prior to blasting, the relevant occupants/owners of surrounding land shall be notified by the Contractor and any concerns addressed. Buildings within the potential damaging zone of the blast shall be surveyed preferably with the owner present and any cracks or latent defects pointed out and recorded either using photographs or video. Failing to do so shall render the Contractor fully liable for any claim of whatsoever nature, which may arise. The Contractor shall indemnify the Employer in this regard.

Borrow pits and quarries.

1. All borrow pit sites shall be clearly indicated on plan.
2. Prior to the onset of any quarrying or borrow pit activities the Contractor shall establish from the Engineer whether authorisation has been obtained, both in terms of the Minerals and Petroleum Resources Development Act 28 of 2002 (via the compilation of an Environmental Management Programme Report) and in terms of the National Environmental Management Act (via the Environmental Impact Assessment process). No excavation or blasting activities shall commerce before the necessary authorizations are in place.
3. Borrow pits to be used must be approved by the engineer and shall at all times be operated according to the regulations promulgated in terms of the Minerals Act (No 50 of 1991): Mine Health and Safety Act (NO 29 of 1996) and Noise and Nuisance Regulations of the Environment Conservation Act (No 73 of 1989).
4. Only a single lane access for construction vehicles shall be provided at borrow pit and quarry sites. New access roads require approval by the Engineer.
5. Stormwater and groundwater controls shall be implemented.
6. Machinery, fuels and hazardous materials vulnerable to flooding shall be stored out of flood risk areas.
7. Vehicles leaving borrow pits shall not deposit/shed mud, sand and debris onto any public road.
8. All loads shall be covered with a tarpaulin or similar to prevent dangers and nuisance to other road users.
9. Borrow pits shall be fenced to prevent unauthorized persons and vehicles from entering the area. Fences shall also be stock and game proof.
10. Rehabilitation and re-vegetation of borrow pits sites shall be according to a method statement to be approved by the ECO.
11. The contractor shall ensure that blasted faces of the pit shall be shape-blasted to the approval of the Site Manager.
12. Where required, dust and fly-rock prevention methods shall be detailed in a Method Statement to be approved by the Site Manager.

13. During the rehabilitation of borrow bits, the slope or the borrow pit shall be graded to blend with the natural terrain and be stabilized to prevent erosion.

Drilling and jackhammering

1. The Contractor shall submit a Method Statement detailing his proposals to prevent pollution during drilling operations. This shall be approved by the Site Manager prior to the onset of any drilling operations.
2. The Contractor shall take all reasonable measures to limit dust generation as a result of drilling operations.
3. Noise and dust nuisances shall comply with the applicable standards.
4. The Contractor shall ensure that no pollution results from drilling operations, either as a result of oil and fuel drips, or from drilling fluid.
5. All affected parties shall be informed at least one week prior to the onset of the proposed drilling/jackhammering operations, and their concerns addressed.
6. Drill coring with water or coolant lubricants shall require a Method Statement approved by the Site Manager.
7. Any areas or structures damaged by the drilling and associated activities shall be rehabilitated by the Contractor to the satisfaction of the Site Manager.

Earthworks

1. The excavations on site shall be done in accordance with SABS 1200 D or DB, as applicable.
2. Prior to Earthworks (including site clearance) starting on site, a search and rescue operation for shall be undertaken as per the requirements set out in the EMP.
2. All earthworks shall be undertaken in such a manner so as to minimise the extent of any impacts caused by such activities.
3. Defined access routes to and from the area of operations as well as around the area of operation shall be detailed in a Method Statement for approval by the Site Manager.
4. No equipment associated with the activity shall be allowed outside of these areas unless expressly permitted by the Site Manager.
5. Mechanical methods of rock breaking, including Montabert type breakers, jackhammers, have noise and dust impacts that shall be addressed.
6. Residents shall be notified at least one week prior to these activities commencing, and their concerns addressed.
7. Chemical breaking shall require a Method Statement approved by the Site Manager.

Trenching

1. Trenching for services shall be undertaken in accordance with the engineering specifications (SABS 1200DE) with the environmental amplifications contain herein, where applicable.
2. Trenching shall be kept to a minimum through the use of single trenches for multiple service provision.
3. The planning and selection of trench routes shall be undertaken in liaison with the Engineer and cognisance shall be given to minimising the potential for soil erosion.
4. Trench routes with permitted working areas shall be clearly defined and marked with painted stakes prior to excavation.
5. The stripping and separation of topsoil shall occur as stipulated by the Engineer. Soil shall be stockpiled for use as backfilling as directed by the engineer.
6. Trench lengths shall be kept as short as practically possible before backfilling and compacting.

7. Trenches shall be backfilled to the same level as (or slightly higher to allow for settlement) the surrounding lard surface to minimise erosion. Excess soil shall be stockpiled in an area approved by the engineer.
8. Immediately after backfilling, trenches and associated disturbed working areas shall be planted with a suitable plant species and regularly watered. Where there is a particularly high erosion risk, a fabric such as Geojute (biodegradable) shall be used in addition to planting.

Dust

1. The Contractors shall be solely responsible for the control of dust arising from the Contractor's operations and for any costs against the Employer for damages resulting from dust.
2. The Contractor shall take all reasonable measures to minimise the generation of dust as a result of construction activities to the satisfaction of the Site Manager.
3. Removal of vegetation shall be avoided until such time as soil stripping is required and similarly exposed surfaces shall be re-vegetated or stabilised as soon as is practically possible.
4. Excavation, handling and transport of erodible materials shall be avoided under high wind conditions or when a visible dust plume is present.
5. During high wind conditions the Site Manager will 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.
6. Where possible, soil stockpiles shall be located in sheltered areas where they are not exposed to the erosive effects of the wind. Where erosion of stockpiles becomes a problem, erosion control measures shall be implemented at the discretion of the Site Manager.
7. Vehicle speeds shall not exceed 40km/h along dust roads or 20km/h when traversing unconsolidated and non-vegetated areas.
8. Appropriate dust suppression measures shall be used when dust generation as unavoidable, e.g. dampening with water, particularly during prolonged periods of dry weather in summer. Such measures shall also include the use of temporary stabilising measures (e.g. chemical soil binders, straw, brush packs, clipping etc.)
9. Straw stabilisation shall be applied at a rate of one bale/ 10m2 and harrowed into the top 100mm of top material for all completed earthworks.

Imported materials.

1. Imported materials shall be free of weeds, litter and contaminants.
2. Sources of imported material shall be listed and approved by the Engineer or the
Engineer's representative (ER) on Site.
3. The Contractor shall provide samples to the ER for approval.
4. Stockpile areas shall be approved by the ER before any stockpiling commences

4. ENGINEERING SPECIFICATIONS

Detailed engineering specifications for a Storm Water & Erosion Management Plan describing and illustrating the proposed storm water control measures must be prepared by the Civil Engineers during the detailed design phase and

should be based on the underlying principles of this Storm Water & Erosion Management Plan. 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) must be indicated within the Final/Updated Storm Water & Erosion Management Plan.
- All temporary and permanent water management structures or stabilisation methods must be indicated within the Final/Updated Storm Water & Erosion Management Plan.
- The drainage system for the development footprint 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 storm water around and away from infrastructure.
- Procedures for storm water flow through a site 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 is to be responsible for ensuring implementation of the erosion control measures on site during the construction period.
- The EPC Contractor holds ultimate responsibility for remedial action in the event that the approved storm water plan is not correctly or appropriately implemented and damage to the environment is caused.

During the construction phase, the contractor must prepare a Storm Water & Erosion Control Method Statement to ensure that all construction methods adopted on site do not cause, or precipitate soil erosion and shall take adequate steps to ensure that the requirements of the Storm Water Management Plan are met before, during and after construction. The designated responsible person on site, must be indicated in the Storm Water & Erosion Control Method Statement and shall ensure that no construction work takes place before the relevant storm water control measures are in place.

An operation phase Storm Water & 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 5: 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 on site.

This WMP has been compiled as part of the project 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 phases. This plan should be updated throughout the life cycle of the infrastructure established for the Gamma Substation and associated 400kV powerline turn-in infrastructure, 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 site should be compiled by the Contractor.

2. RELEVANT ASPECTS OF THE SITE

It is expected that the development of various infrastructure will generate construction solid waste, as well as general waste and hazardous waste during the lifetime of the Gamma substation and associated 400kV powerline turn-in infrastructure.

Waste generated on site, 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, batteries situated in specially adapted shipping containers, and waste ink cartridges.
- Recyclable waste in the form of paper, glass, steel, aluminium, wood/ wood pallets, plastic (PET bottles, PVC, LDPE) and cardboard.
- Organic waste from food waste as well as alien and endemic vegetation removal.
- Sewage from portable toilets and septic tanks.
- Inert waste from spoil material from site clearance and trenching works.

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); and
- 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 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; and
- Waste that cannot be recycled is to be disposed of in the most environmentally responsible manner.

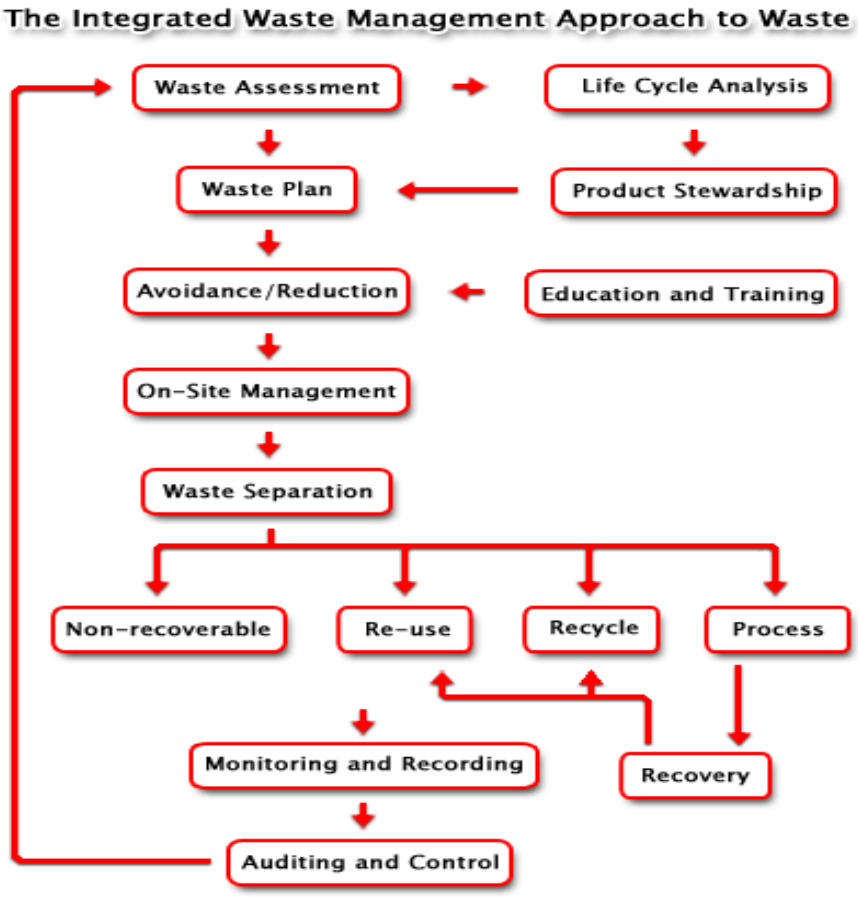

Figure 1: Integrated Waste Management Flow Diagram
(Source: http://www.enviroserv.co.za)

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 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.
- » Septic tanks and portable toilets must be monitored by the EO or responsible subcontractor and maintained regularly. Below ground storage of septic tanks must withstand the external forces of the surrounding environment. The area above the tank must be demarcated to prevent any vehicles or heavy machinery from moving around in the surrounding area.
- » 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 site for the storage of all waste streams before removal from site. 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 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' 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 site 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 site 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 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 appropriately 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 from part of the EO's reports to the ECO on a monthly basis.

APPENDIX 6: EMERGENCY PREPARDNESS, RESPONSE & 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

The proposed update to the layout (dated April 2023) as part of this Part 2 Amendment process consists of the proposed 132kV/400kV substation yard and the proposed 400kV Droerivier-Hydra 2 powerline turn-in on both Farm Uit Vlugt Fontein No.265 and Remainder of Farm Schietkuil No.3 in the Western and Northern Cape Provinces. (as originally assessed during EIA undertaken by ACER in 2007.)

Component	Description / Dimensions

Location of the site	Pixely Ka Seme and Central Karoo District Municipalities
Farm Names	Portion 1 of Farm Uit Vlugt Fontein No.265 and Remainder of Farm Schietkuil No.3
Original Substation Site Area Assessed (2007)	1.5 x 1,15km² (172 ha)
Substation Structure Area	1,290 m x 465 m (60 ha)
Access to Site	Access road to R63
Transmission lines	765kV outgoing transmission lines (6 x 400 kV feeder lines that feeds into existing 400kV power grid)
Transformers	2 EHV transformers

- Due to the scale and nature of this development, it is anticipated that the following risks could potentially arises during the construction and operation phases:
- Fires;
- Leakage of hazardous substances;
- Storage of flammable materials and substances;
- Flood events;
- Accidents; and
- 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 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 the 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 development footprint. 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, pickaxes 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 the 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.

d) 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.

e) Reporting procedures

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.

- 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

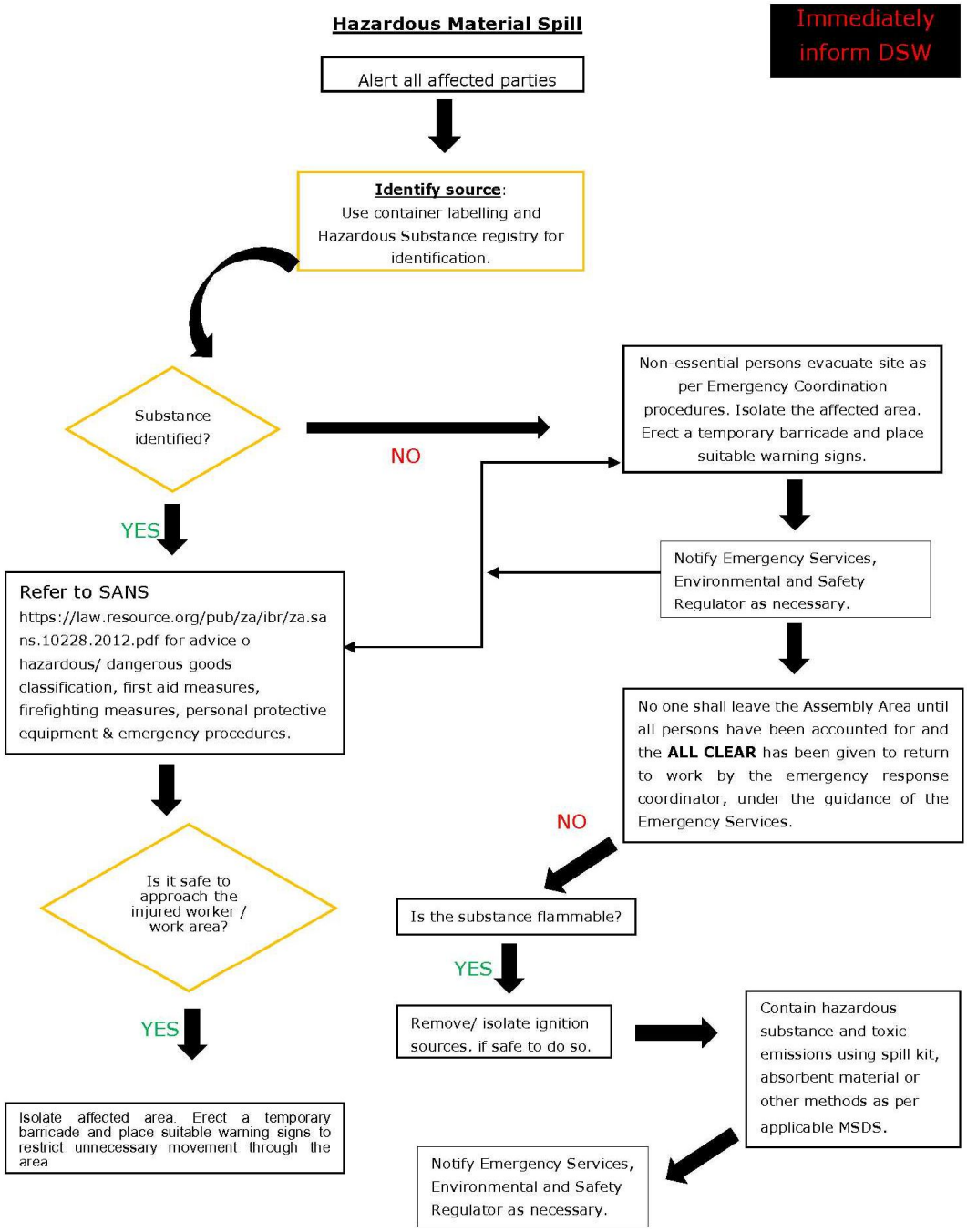

Figure 1: Hazardous Material Spill

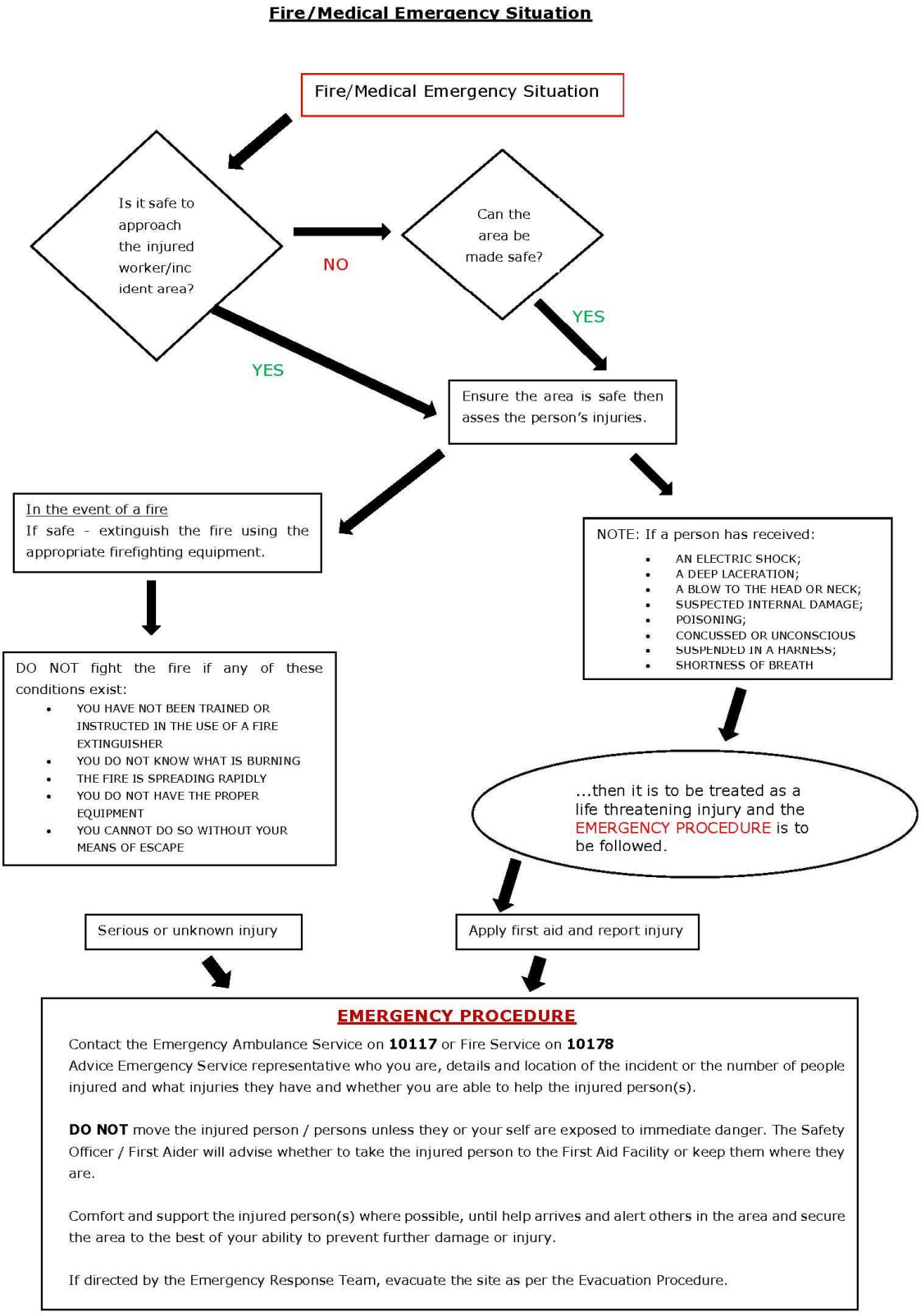

Figure 2: Emergency Fire/Medical

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 7: PLANT SEARCH & RESUE AND ALIEN INVASIVE SPECIES ERADICATION MANAGEMENT PLAN

1. PLANT SEARCH & RESCUE

PURPOSE

The purpose of the Plant Search and Rescue Protection Plan is to implement avoidance and mitigation measures, in addition to the mitigations included in this Generic EMPr to reduce the impact of the various infrastructure establishment at the authorised 132/400kV Gamma Substation yard 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 footprint.

The Plan first provides some legislative background on the regulations relevant to listed and protected species under the Red List of South African plants, and trees protected under the National 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.

IDENTIFICATION OF LISTED 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 and Fisheries, and Environment (DFFE) under the National 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/) are protected and require provincial permits. Of particular relevance to the current study are the following, which are extracted from the legislation and are not intended to provide a comprehensive list of all protected species, only those which are likely to be encountered in the area. The reader is referred to the schedules of the Act for a full list of species listed under the act.

In this section, the listed species observed to occur within the surrounding area are identified and listed below. Those present and the number affected within the development footprint would be clarified following the pre-construction walk-through. The list is not considered exhaustive and additional species may be observed to be present during the pre-construction walk-through, which should be conducted at a favourable time of year, such that there is a maximal chance of picking up geophytes and other species which may not be easily observed at other times of the year.

MITIGATION & AVOIDANCE OPTIONS

The primary mitigation and avoidance measure that must be implemented at the pre-construction phase of the development footprint. This defines which and how many individuals of listed and protected species are found within the

development footprint. This information is required for the DFFE and Provincial Conservation permits which must be obtained before construction can commence.

Where listed plant species fall within the development footprint and avoidance is not possible, then it may be possible to translocate the affected individuals outside of the development footprint. 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.

RESCUE AND PROTECTION PLAN

Pre-construction

- Identification of all listed species which may occur within the site, based on the SANBI POSA database as well as the specialist BA studies for the site and any other relevant literature.
- Before construction commences at the site, the following actions should be taken:
    - A permit to clear the site and relocate species of concern is required from provincial conservation authority 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 footprint. Affected individuals should be translocated to a similar habitat outside of the development footprint and marked for monitoring purposes.

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 EO, to ensure that the EO is able to monitor activities appropriately.
- All cleared material should be handled according to the Re-vegetation and Habitat Rehabilitation Plan and used to encourage the recovery of disturbed areas.
- EO to monitor vegetation clearing at the site. 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 rehabilitation of already cleared areas should be identified and relocated before general clearing takes place.
- Any listed species observed within the development footprint 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 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.

Operation

- Access to the site should be strictly controlled and all personnel entering or leaving the site 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 site.

MONITORING & REPORTING REQUIREMENTS

The following reporting and monitoring requirements are recommended as part of the plant rescue and protection plan:

- The location and distribution of all listed and protected species must be compiled. 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 DFFE and the provincial conservation authority. 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 DFFE or the provicial authority 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 site.
- 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.

Table a. Provincially Protected flora species recorded within the assessment area and their respective growth form and conservation status. Species in the Provincial column are protected by legislation. EN = Endangered, NT= Near Threatened, VU = Vulnerable, LC = Least Concern and NE = Not Evaluated

Family	Scientific name	Provincial	Red List
Aizoaceae	*Aizoon africanum*	Sch. 4	LC
Aizoaceae	*Delosperma multiflorum*	Sch. 4	LC
Aizoaceae	*Drosanthemum dejagerae*	Sch. 4	DDT
Aizoaceae	*Drosanthemum hispidum*	Sch. 4	LC
Aizoaceae	*Malephora lutea*	Sch. 4	LC

Aizoaceae	*Mesembryanthemum coriarium*	Sch. 4		LC
Aizoaceae	*Ruschia intricata*	Sch. 4		LC
Aizoaceae	*Ruschia spinosa*	Sch. 4		LC
Aizoaceae	*Stomatium duthiae*	Sch. 4		LC
Amaryllidaceae	*Boophone disticha*	Sch. 4		LC
Apocynaceae	*Gomphocarpus fruticosus*	Sch. 4		LC
Apocynaceae	*Pachypodium succulentum*	Sch. 4		LC
Asphodelaceae	*Aloe broomii*	Sch. 4		LC
Asphodelaceae	*Aloe claviflora*	Sch. 4		LC
Asphodelaceae	*Haworthia semiviva*	Sch. 4		LC
Iridaceae	*Moraea polystachya*	Sch. 4		LC
Iridaceae	*Moraea* sp.		Sch. 4	
Iridaceae	*Romulea tortuosa*	Sch. 4		LC

2. ALIEN INVASIVE SPECIES MANAGEMENT PLAN

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 Gamma substation and associated 400kV powerline turn-in infrastructure. 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 life-cycle of the various infrastructure, 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.

LEGISLATIVE CONTEXT

Conservation of Agricultural Resources Act (Act No. 43 of 1983)

In terms of the amendments to the regulations under the Conservation of Agricultural Resources Act (Act No. 43 of 1983), 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 (NEM:BA) regulates all invasive organisms in South Africa, including a wide range of fauna and flora. Regulations have been published in Government Notices R.506, R.507, R.508 and R.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 Conservation of Agricultural Resources Act (Act 43 of 1983) (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.

ALIEN PLANT MANAGEMENT PRINCIPLES

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.

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. Appropriate registered chemicals and other possible control agents should be considered in the action plans for each site/species. The use of chemicals are 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 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.

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 won't 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.

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 so 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 additional disturbance which stimulates alien plant invasion and may also be ineffective for many woody species which 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, product 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) – GNR 1120 of 2010.
- South African Bureau of Standards, 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, Agricultural Remedies and Stock Remedies Act (Act No. 36 of 1947). This is regulated by the Department of Environment, Forestry and Fisheries.

- **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 on 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), Department of Environment, Forestry and Fisheries (DEFF) can be contacted.

General management practices

The following general management practices should be encouraged or strived for:

- Establish an on-going 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 regrow, 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.

Monitoring

In order to assess the impact of clearing activities, follow-ups and rehabilitation efforts, 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.
This Alien Invasive Management Plan as developed in consultation with the Terrestrial Ecologist must be followed and abided by for all phases of the development.

APPENDIX 8: CONSTRUCTION AND OPERATION MONITORING PLAN

1. Purpose

This monitoring plan serves as a framework for the set-up of bird monitoring during the construction and operational phase of the development. The relevant best practice guidelines published by BirdLife (version as relevant at the time of setting up the programme) should also be read in conjunction with this framework document and should be considered when setting up bird monitoring.

This management plan details what needs to be monitored in terms of this Generic EMPr, detailing monitoring techniques, frequency, and reporting requirements. This plan outlines response actions for the monitoring of possible impacts resulting from the infrastructure installation on bird communities. It details response procedures that will aid in gathering of data and information on bird communities present in the area and to monitor the effectiveness of the mitigation measures. The plan has been prepared to effective and efficient access to all the information required in responding to possible present bird communities in the area. Such that, this management plan will enable an effective monitoring and response action in the conservation of faunal species and communities (including species of conservation concern) during the project. Contractors are expected to comply with all procedures described in this document. A Method Statement must 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.

2. Construction Phase Monitoring

Construction phase bird monitoring must be implemented in line with applicable guidelines. This monitoring can be used to:

a) Determine if the proposed mitigation measures (e.g., buffers) are implemented by the developer, and whether or not they are effective in minimising impacts on sensitive birds during construction.
b) Provide insights into the triggers and duration of any observed changes in species presence, abundance and behaviour,
c) Provide an opportunity to gather additional data on priority species and focal points (particularly where nest sites have been identified).

Active breeding in the immediate surroundings must also be monitored during construction by the Environmental Control Officer (ECO)/Avifaunal Specialist during site visits and audits. Should any bird nests be found that are likely to be disturbed by construction activities, these will not be relocated without first consulting an avifaunal specialist. If nests cannot be relocated, other mitigation measures must be investigated.

The construction Phase ECO, and the on-site Environmental Manager (or Environmental Officer (EO) as the case may be) should have sufficient experience and knowledge of local avifauna to identify red data and priority bird species, as well as their nests. The ECO and Environmental Manager/EO must then, during audits/site visits, make a concerted effort to look out for such breeding activities of red data species, 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. If any nests or breeding locations for these species are located, the avifaunal specialist is to be contacted for further instruction.

3. Operational Monitoring

Operational phase bird monitoring must be implemented in line with the most recent and applicable officially accepted guidelines. The aims of this monitoring will include:

» To compare the abundance index for all the priority species within the development area after construction against the pre-construction baseline to measure actual displacement due to the construction and operation phases. Recommended survey method is line transect counts.

» To estimate the risk of priority species being electrocuted by powerlines by recording actual carcasses and comparing post-construction flight patterns with pre-construction baseline data. Recommended methods are carcass searches and Vantage Point (VP) watches.

As stated in the best practice guideline[1] in minimum, survey protocols used in the pre-construction monitoring should be repeated during the first two years of operation and should be combined with monitoring of fatalities. The need for further monitoring of bird abundance and movements should be reviewed at the end of this to determine if it is necessary to continue with some, or all, components of this work. The need for further monitoring of fatalities should also be reviewed after the first two years, and then again on an annual basis. Carcass searches must, however, be repeated in the fifth year, and again every five years thereafter.

Prior to the carcass search commencing and before a carcass search team is appointed for monitoring in the operation phase, the Landowners/ Farmers must be consulted. The consultation should outline the methods of the carcass searches. Details, e.g., frequency of searches, contact/ responsible persons, access control, etc. must be discussed and agreed with the Landowners/ Farmers. To ensure the safety of Landowners/ Farmers it is also recommended that a background check is done on all employees/ members of the carcass search team before they are appointed and that proof of this is kept. The carcass search team should be introduced to the Landowners/ Farmers. Landowners/ Farmers should, at all times, be kept informed of the whereabouts of the carcass search team. All relevant EMPr conditions, e.g., no hunting/ killing of animals, etc. will apply to the carcass search team. They must therefore be inducted to the project site and made aware of all rules, regulations, and code of conduct. Landowner Requirements agreed upon will be signed and form part of this Report.

This document must be updated as and when required to ensure compliance with the relevant best practice guidelines.

[1] A.R. Jenkins, C.S. van Rooyen, J.J. Smallie, J.A Harrison, M. Diamond, H.A. Smit-Robinson and S. Ralston (2015). Best Practice Guidelines for assessing and monitoring the impact of wind energy facilities on birds in South Africa. Third Edition, 2015

APPENDIX 9: RE-VEGETATION AND HABITAT REHABILITATION PLAN

1. PURPOSE

The purpose of the Revegetation and Habitat Rehabilitation Plan is to ensure that areas cleared or impacted during construction activities within the development footprint for various infrastructure at the authorised 400kV Droerivier Hydra 2 Overhead Powerline turn-ins, and those 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 Re-vegetation and Habitat Rehabilitation Plan for the site 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.

OBJECTIVE: Re-vegetate open areas and rehabilitate disturbed areas

This Re-vegetation and Habitat Rehabilitation Plan must be read in conjunction with other site-specific plans, including the Alien Invasive Species Eradication and Management Plan, Erosion Management Plan*, and Plant Search & Rescue and Protection Plan. Prior to the commencement of construction, a detailed Re-vegetation and Rehabilitation Plan and Method Statement for the site must be compiled with the aid of a suitably qualified and professionally registered specialist (with a botanical or equivalent qualification).

2. RELEVANT ASPECTS OF THE SITE

The vegetation of the proposed Gamma Sub-station site falls in the Nama-Karoo Biome, more specifically in the Upper Karoo Bioregion. The most recent vegetation map at the time (Mucina et al., 2005) classifies it as **Eastern Upper Karoo**. Construction of the proposed Gamma Substation is expected to destroy most of the vegetation of the site, and, adopting a precautionary principle, it is assumed that all of the vegetation of the site will be cleared for construction. The vegetation of the Nama-Karoo is dominated by chamaephytes (low-growing shrubs) and hemicryptophytes (graminoids) in a grassy, dwarf shrubland (Edwards, 1983). Graminoids are mostly C4 (Vogel et al. 1978) and shrubs are mostly asteraceous (daisy-family; Mucina and Rutherford, 2006). The Upper Karoo has been much modified by grazing with Mucina and Rutherford (2006) proposing five stages in its degradation.

3. REHABILITATION METHODS AND PRACTICES

- Clearing of invaded areas must be conducted as per the Alien Management Plan, included in the 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 site prior to clearance or from suitable neighbouring sites.
- Topsoil must be reserved wherever possible on site, to be utilised during rehabilitation.
- Sods used for revegetation must be obtained directly from the site, but not from the sensitive areas. Sods must 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 must 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 must be pegged down to ensure that it captures soil and organic matter flowing over the surface.
- The final rehabilitated area must 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 must be implemented where feasible.
- No construction equipment, vehicles or unauthorised personnel must be allowed onto areas that have been rehabilitated.
- Where rehabilitation sites are located within actively grazed areas, they must be fenced off, this must be undertaken in consultation with the landowner.
- Any runnels, erosion channels or wash-aways developing after revegetation must be backfilled and consolidated and the areas restored to a proper stable condition.
- Re-vegetated areas must be monitored frequently and prepared and revegetation from scratch should inadequate signs of surface coverage or grown be evident after two growth seasons. Adequate recovery must be assessed by a qualified botanist or rehabilitation specialist.

- The stockpiled vegetation from the clearing operations must be reduced to mulch where possible and retained along with topsoil to encourage seedbank 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 must be applied to individual plants only. General spraying must be strictly prohibited, and only the correct herbicide type must be applied.
- Once rehabilitated, areas must be protected to prevent trampling and erosion.
- Fencing must 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 Officer (EO) and EPC Contractor will be responsible for initiating and maintaining a suitable monitoring system. Once the development is operational, the Developer 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 must 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:

- Rehabilitation areas must be monitored every 4 months for the first 12 months following construction, or as per the recommendations of specialist.
- 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 must 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, must be adaptively managed with particular erosion control measures, depending on the situation.

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 commences.

Monitoring of the rehabilitation success, as well as follow-up adaptive management, combined with the clearing of emerging alien plant species must all continue for as long as is considered necessary, depending on regrowth rates.