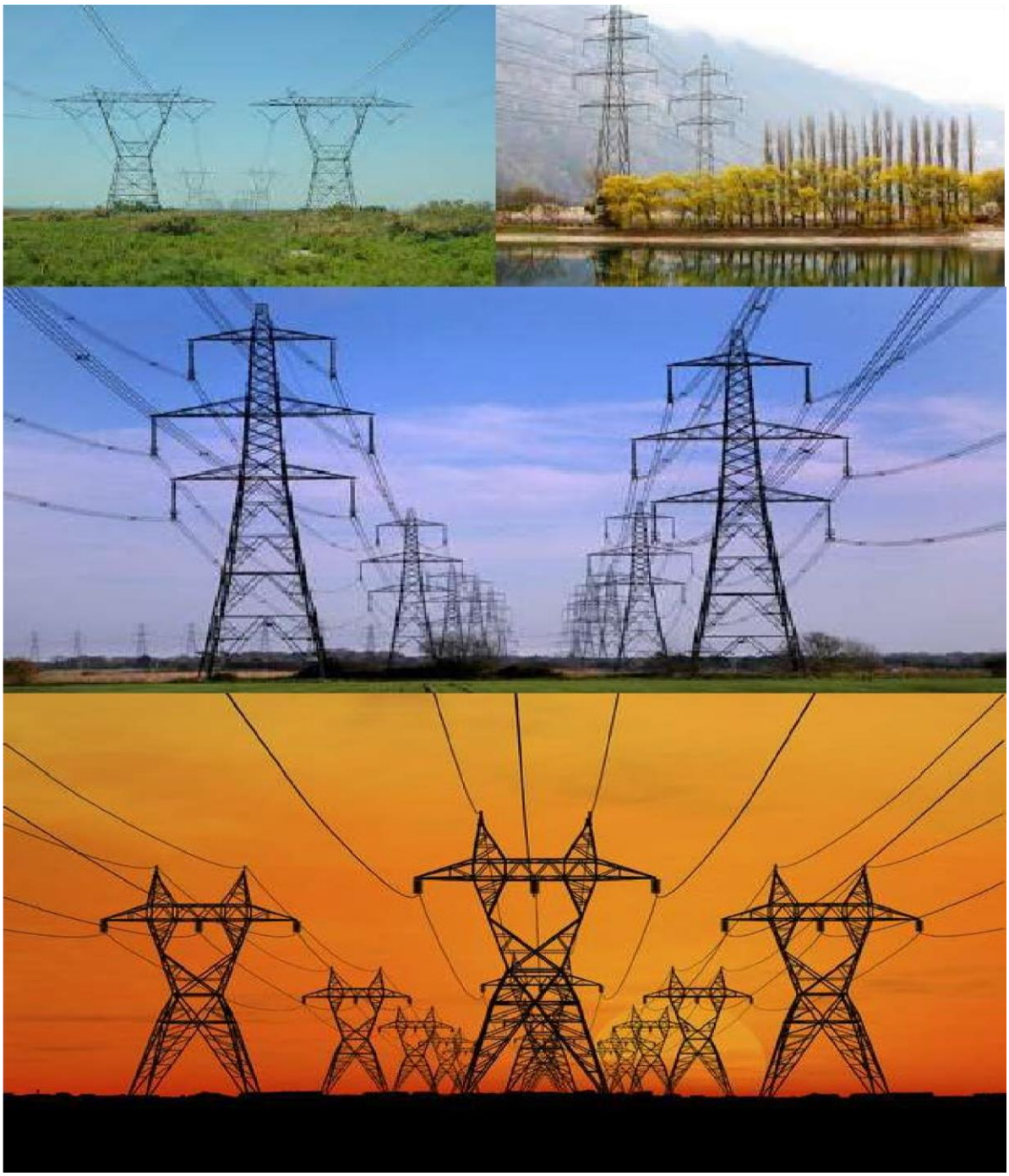
GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR THE DEVELOPMENT AND EXPANSION FOR OVERHEAD ELECTRICITY TRANSMISSION AND DISTRIBUTION INFRASTRCUTURE



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environmental affairs
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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 overhead electricity transmission and distribution infrastructure, 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 overhead electricity transmission and distribution infrastructure. 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 overhead electricity transmission and distribution infrastructure requiring EA in terms of NEMA, i.e. with a capacity of 33 kilovolts or more. 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

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A		Provides general guidance and information and is not **legally binding**	Definitions, acronyms, roles & responsibilities and documentation and reporting.
B	1	Pre-approved EMPr template generic	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 overhead electricity 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 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

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			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 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

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			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 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 be 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.

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

Once the activity has commenced a holder of an EA may make amendments to the environmental management controls in the following manner:

- Amendment of the environmental management outcome – in line with regulation 37 of the Environmental Impact Assessment Regulation, 2014; and
- Amendment of the environmental management activity – in line with regulation 36 of the Environmental Impact Assessment Regulations, 2014.

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 2 requires a map to be produced.

Sub-section 1 contains the project name, the applicants name and details, the site information which includes coordinates of the corridor in which the proposed electricity transmission and

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distribution infrastructure is proposed as well as the 21-digit Surveyor General code of each cadastral land parcel and where available the farm name.

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

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

(i) 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.

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PART A – GENERAL INFORMATION

1. DEFINITIONS

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

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

"construction camp" is the area designated for key construction infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;

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

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

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

The method statement must cover applicable details with regard to:

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

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

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

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

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

"works" means the works to be executed in terms of the Contract

2. ACRONYMS and ABBREVIATIONS

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

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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 a generic EMPr

Responsible Person(s)	**Role and Responsibilities**
Developer's Project Manager (DPM)	Role The Project Developer is accountable for ensuring compliance with the generic EMPr and any conditions of approval from the competent authority (CA). Where required, an independent 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 environmental authorization (EA). The Project Developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent. Responsibilities Be fully conversant with the conditions of the EA; Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s); Issuing of site instructions to the Contractor for corrective actions required; Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings. Overall management of the project and EMPr implementation; and Ensure that periodic environmental performance audits are undertaken on the project implementation.

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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&AP's), as required. Issues of non-compliance raised by the ECO must be taken up by the Project Manager, and resolved with the Contractor as per the conditions

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Responsible Person(s)	Role and Responsibilities
	of his contract. Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the performance Specification) must be endorsed by the Project Manager. The ECO must also, as specified by the EA, report to the relevant CA as and when required. Responsibilities The responsibilities of the ECO will include the following: Be aware of the findings and conclusions of all EA related to the development; - Be familiar with the recommendations and mitigation measures of this EMPr; - Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them; - Undertake regular and comprehensive site inspections / audits of the construction site according to the generic EMPr and applicable licenses in order to monitor compliance as required; - Educate the construction team about the management measures contained in the EMPr and environmental licenses; - Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective; - Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements; - In consultation with the Developer Site Supervisor order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses; - Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns; - Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr; - Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO); - Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc.) as well as corrective and preventive actions taken;

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Responsible Person(s)	Role and Responsibilities
	- Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken; Assisting in the resolution of conflicts; - Facilitate training for all personnel on the site – this may range from carrying out the training, to reviewing the training programmes of the Contractor; - In case of non-compliances, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance; - Maintenance, update and review of the EMPr; - Communication of all modifications to the EMPr to the relevant stakeholders.
developer Environmental Officer (dEO)	Role The dEOs will report to the Project Manager and are responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities. Responsibilities - Be fully conversant with the EMPr; - Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures; - Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s) ; - Confine the development site to the demarcated area; - Conduct environmental internal audits with regards to EMPr and authorisation compliance (on cEO); - Assist the contractors in addressing environmental challenges on site; - Assist in incident management: - Reporting environmental incidents to developer and ensuring that corrective action is taken, and

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Responsible Person(s)	Role and Responsibilities
	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	Role The Contractor appoints the cEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr while performing the onsite activities as per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion for overhead electricity transmission and distribution infrastructure activities. Responsibilities project delivery and quality control for the development services as per appointment; - employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site during the construction period; - ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely; - attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones; - ensure that contractors' staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in EMPr, to the satisfaction of the ECO.

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

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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 overhead electricity transmission and distribution infrastructure projects as a minimum requirement.

4.1 Document control/Filing system

The holder of the EA is solely responsible for the upkeep and management of the EMPr file. 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.

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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;

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- 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;

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- 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;

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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:

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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.

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PART B: SECTION 1

5. IMPACT MANAGEMENT OUTCOMES AND ACTIONS

This section provides a pre-approved generic EMPr template with activities that are common to the development of overhead electricity transmission and distribution infrastructure. There are 30 activities identified for the development of overhead electricity transmission and distribution infrastructure, and for each activity a set of prescribed impact management outcomes and associated management actions have been identified. Holders of EAs are responsible to ensure the implementation of these controls for all projects as a minimum requirement for mitigating the impact of particular construction related activities. and to ensure the implementation of these outcomes and actions for all projects as a minimum requirement, in order to mitigate the impact of such aspects identified for the development or expansion of overhead electricity transmission and distribution infrastructure.

The template provided below is to be completed by providing the information under each headings for each environmental 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.

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5.1 Environmental awareness training

Management outcome: All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
– All staff must receive environmental awareness training prior to commencement of the activities; – The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course; – Refresher environmental awareness training is available as and when required; – All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr; – The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum: a) Safety notifications; and b) No littering. – 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;	cEO ECO	Weekly toolbox talks Awareness Training Induction Presentation	Start of construction and when a new employee starts work Weekly	dEO ECO	Fortnightly	Record of attendance to the toolbox talks and awareness training must be filed in the Site Environmental File Contents of induction Presentation Poster displays

e) Procedures to be followed when working near or within sensitive areas; f) Wastewater management procedures; g) Water usage and conservation; h) Solid waste management procedures; i) Sanitation procedures; j) Fire prevention; and k) Disease prevention. – A record of all environmental awareness training courses undertaken as part of the EMPr must be available; – Educate workers on the dangers of open and/or unattended fires; – A staff attendance register of all staff to have received environmental awareness training must be available. Course material must be available and presented in appropriate languages that all staff can understand.						

5.2 Site Establishment development

Management outcome: Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**

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– A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management; – Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through; – Sites must be located where possible on previously disturbed areas; – The camp must be fenced in accordance with ***Section 5.5: Fencing and gate installation***; and – The use of existing accommodation for contractor staff, where possible, is encouraged.	Contractor	Method Statement and layout of construction camps / laydown areas to be compiled and approved by the ECO	Prior to site establishment	ECO	Once-off	Approved Method Statement and Layout Plan

5.3 Access restricted area

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**

MK

– Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any additional areas identified during development; – Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate; and – Unauthorised access and development related activity inside access restricted areas is prohibited.	Contractor	Demarcation of sensitive areas with danger tape or barrier netting and signage	Prior to site establishment	dEO ECO	Fortnightly	Site Inspection Barriers and signage maintained in good condition

5.4 Access roads

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**

MK

– An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities; – All private roads used for access to the servitude must be maintained and upon completion of the works, be left in at least the original condition – All contractors must be made aware of all these access routes. – Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense; – Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads; – In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with ***section 4.9: photographic record***; prior to use and the condition thereof agreed by the landowner, the DPM, and the contractor; – Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands – Access roads must only be developed on a pre-planned and approved roads.	Contractor	Access routes must be mapped prior to construction	Prior to site establishment	dEO ECO	Fortnightly	Site Inspection

5.5 Fencing and Gate installation

Management outcome: To minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.

Impact Management Actions	Implementation	Monitoring

	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Use existing gates provided to gain access to all parts of the area authorised for development, where possible; – Existing and new gates to be recorded and documented in accordance with **section *4.9: photographic record***; – All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner; – At points where the line crosses a fence in which there is no suitable gate within the extent of the line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner; – Care must be taken that the gates must be so erected that there is a gap of no more than 100 mm between the bottom of the gate and the ground; – Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate; – Original tension must be maintained in the fence wires; – All gates installed in electrified fencing must be re-electrified; – All demarcation fencing and barriers must be maintained in good working order for the duration of the development activities; – Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where applicable; – Any temporary fencing to restrict the movement of life-stock must only be erected with the permission of the land owner. – All fencing must be developed of high quality material bearing the SABS mark; – The use of razor wire as fencing must be avoided;	Contractor	Access routes must be mapped prior to construction	Ongoing	dEO ECO	Fortnightly	Site Inspection

MK

– Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from site. Site security will be required at all times; – On completion of the development phase all temporary fences are to be removed; – The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely.						

5.6 Water Supply Management

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; – The Contractor must ensure the following: a. The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river; b. No damage occurs to the river bed or banks and that the abstraction of water does not entail stream diversion activities; and c. All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented. – Ensure water conservation is being practiced by: a. Minimising water use during cleaning of equipment;	Contractor	Water abstraction from municipal sources or licensed sources	Construction	ECO	Fortnightly	Site inspection Proof of water use authorisation for the abstraction of water (if applicable).

b. Undertaking regular audits of water systems; and c. Including a discussion on water usage and conservation during environmental awareness training. d. The use of grey water is encouraged.						

5.7 Storm and waste water management

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; – All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility; – Natural storm water runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO; 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	DSS cEO	Detailed SWMP, if any	Construction	DPM ECO	Fortnightly	Approval of SWMP, if any

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environment must be subject to the Project Manager's approval and support by the ECO.						

5.8 Solid and hazardous waste management

Management outcome: Wastes are appropriately stored, handled and safely disposed of at a licensed waste facility.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**

MK

– All measures regarding waste management must be undertaken using an integrated waste management approach; – Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided; – A suitably positioned and clearly demarcated waste collection site must be identified and provided; – The waste collection site must be maintained in a clean and orderly manner; – Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal; – Staff must be trained in waste segregation; – Bins must be emptied regularly; – General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company; – Hazardous waste must be disposed of at a registered waste disposal site; – Certificates of safe disposal for general, hazardous and recycled waste must be maintained.	Contractor	Segregated disposal bins All waste containers have lids Waste contractor appointed Daily to weekly site cleanups	Ongoing	ESO ECO	Daily Fortnightly	Waste safe disposal slips; Service Level Agreements

5.9 Protection of watercourses and estuaries

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**

MK

– All watercourses must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities; – In the event of a spill, prompt action must be taken to clear the polluted or affected areas; – Where possible, no development equipment must traverse any seasonal or permanent wetland – No return flow into the estuaries must be allowed and no disturbance of the Estuarine functional Zone should occur; – Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available; – There must not be any impact on the long term morphological dynamics of watercourses or estuaries; – Existing crossing points must be favored over the creation of new crossings (including temporary access) – When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken: a) Water levels during the period of construction; 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	Contractor	Demarcation of watercourses and sensitive areas maintaining the specified buffers Spill control kits available on site and operators trained to use them Spills cleaned promptly to prevent water contamination	Construction	ECO	Fortnightly	Watercourses and sensitive areas are marked as Restricted areas Spills controlled Evidence of operators trained in spill prevention

MK

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.						

5.10 Vegetation clearing

Management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
General: – Indigenous vegetation which does not interfere with the development must be left undisturbed; – Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species; – Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing; – Permits for removal must be obtained from the relevant CA prior to the cutting or clearing of the affected species, and they must be filed;	Contractor Ecologist	Working within demarcated areas AIP eradication and control	Pre- Construction and Construction and Operation Once-off	dECO ECO	Weekly Fortnightly	Site Inspection

– The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals; – Trees felled due to construction must be documented and form part of the Environmental Audit Report; – Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris; – Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained; – A daily register must be kept of all relevant details of herbicide usage; – No herbicides must be used in estuaries; – All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance to ***Section 5.3: Access restricted areas***. – Alien invasive vegetation must be removed and disposed of at a licensed waste management facility. Servitude: – Vegetation that does not grow high enough to cause interference with overhead transmission and distribution infrastructures, or cause a fire hazard to any plantation, must not be cut or trimmed unless it is growing in the road access area, and then only at the discretion of the Project Manager; – Where clearing for access purposes is essential, the maximum width to be cleared within the servitude must be in accordance to distance as agreed between the land owner and the EA holder						

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

5.11 Protection of fauna

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;	Contractor	Awareness Training Injuring, capturing, killing of animals identified on site must be reported	Construction	ECO	Fortnightly	Training material relating to wildlife management

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– The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme; – Breeding sites must be kept intact and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present; – Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds; – No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be marked as Access restricted areas; – No deliberate or intentional killing of fauna is allowed; – In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up, being electrocuted and causing power outages; and – No Threatened or Protected species (ToPs) and/or protected fauna as listed according NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/or relocated without appropriate authorisations/permits.	Ecologist	as an environmental incident and investigated	Once-off			

5.12 Protection of heritage resources

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**

MK

– Identify, demarcate and prevent impact to all known sensitive heritage features on site in accordance with the No-Go procedure in ***Section 5.3: Access restricted areas***; – Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance; All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/ palaeontologist (or the South African Police Services), so that a systematic and professional investigation can be undertaken. Sufficient time must be allowed to remove/collect such material before development recommences.	Contractor Paleontologist /Archaeologist	Implement chance finds procedure immediately upon uncovering heritage material Training in chance finds for all employees	Pre-construction and construction Once-off	dEO ECO Paleontologist/Archaeologist	Fortnightly As required	Chance finds records

5.13 Safety of the public

Management outcome: All precautions are taken where possible 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**

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– Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc.; – All unattended open excavations must be adequately fenced or demarcated; – Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding; – Ensure structures vulnerable to high winds are secured; Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.	Contractor	Awareness Training Injuries and complaints on site must be reported as an environmental incident and investigated	Construction	ECO	Fortnightly	Training material relating to health and safety for the public Complaints Register

5.14 Sanitation

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**

MK

– Mobile chemical toilets are installed onsite if no other ablution facilities are available; – The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances; – Where mobile chemical toilets are required, the following must be ensured: a) Toilets are located no closer than 100 m to any watercourse or water body; b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause; c) No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the EMPr; d) Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out; e) Toilets are emptied before long weekends and workers holidays, and must be locked after working hours; f) Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards; A copy of the waste disposal certificates must be maintained.	Contractor	Provision of ablution facilities Management of facilities	Construction	ESO ECO	Daily Fortnightly	Proof of servicing and safe disposal Service level agreement with service provider

5.15 Prevention of disease

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**

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– Undertake environmentally-friendly pest control in the camp area; – Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS; – The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area; – Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable; – Free condoms must be made available to all staff on site at central points; – Medical support must be made available; – Provide access to Voluntary HIV Testing and Counselling Services.	Contractor	Provision of services	Pre- and construction phase	ESO	Fortnightly	Proof of services on site

5.16 Emergency procedures

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**

MK

– Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project; – The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation; – All staff must be made aware of emergency procedures as part of environmental awareness training; – The relevant local authority must be made aware of a fire as soon as it starts; In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see ***Hazardous Substances section 5.17***).	Contractor	Provision of emergency procedures	Pre- and construction phase	ESO	Fortnightly	Proof of emergency procedures on site

5.17 Hazardous substances

Management outcome: safe storage, handling, use and disposal of hazardous substances.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
– The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible; – All hazardous substances must be stored in suitable containers as defined in the Method Statement; – Containers must be clearly marked to indicate contents, quantities and safety requirements; – All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers; – Bunded areas to be suitably lined with a SABS approved liner;	Contractor	Bunding of hazardous storage sites	Construction	ESO ECO	Daily Fortnightly	Site inspection of hazardous storage areas and inspection of drip trays and impervious surfaces

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– An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis; – All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS); – All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet; – Employees handling hazardous substances / materials must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment must be made available; – The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers; – The tanks/ bowsers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/ bowsers (110% statutory requirement plus an allowance for rainfall); – The floor of the bund must be sloped, draining to an oil separator; – Provision must be made for refueling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained; – All empty externally dirty drums must be stored on a drip tray or within a bunded area; – No unauthorised access into the hazardous substances storage areas must be permitted; – No smoking must be allowed within the vicinity of the hazardous storage areas;						

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– Adequate fire-fighting equipment must be made available at all hazardous storage areas; – Where refueling away from the dedicated refueling station is required, a mobile refueling unit must be used. Appropriate ground protection such as drip trays must be used; – An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substance must be available at all times; – The responsible operator must have the required training to make use of the spill kit in emergency situations; – An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken; In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to ***Section 5.7*** for procedures concerning ***storm and waste water management*** and ***5.8*** for ***solid and hazardous waste management.***						

5.18 Workshop, equipment maintenance and storage

Impact Management outcome: Soil, surface water and groundwater contamination is minimized.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
– Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area; – During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a	Contractor	Bunding of storage sites and inspection of equipment	Construction	ESO ECO	Daily Fortnightly	

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suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts; – Leaking equipment must be repaired immediately or be removed from site to facilitate repair; – Workshop areas must be monitored for oil and fuel spills; – Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available; – The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil / water separator where maintenance work on vehicles and equipment can be performed; Water drainage from the workshop must be contained and managed in accordance Section ***5.7: Storm and waste water management***.						

5.19 Batching plants

Impact Management outcome: Minimise spillages and contamination of soil, surface water and groundwater.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
– Concrete mixing must be carried out on an impermeable surface; – Batching plants areas must be fitted with a containment facility for the collection of cement laden water. – Dirty water from the batching plant must be contained to prevent soil and groundwater contamination	Contractor	Identification of area that is not sensitive and set-up batching plant	Construction	ESO ECO	Daily Fortnightly	Site inspection of batching plant area to ensure no contamination is occurring to environment

– Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains; – A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted; – Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility; – Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site; – Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to ***Section 5.20: Dust emissions***) – Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility; – Temporary fencing must be erected around batching plants in accordance with Section ***5.5: Fencing and gate installation***.						

5.20 Dust emissions

Impact Management outcome: Dust prevention measures are applied to minimise the generation of dust.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**

MK

– Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO; – Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re-vegetated or stabilised as soon as is practically possible; – Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present; – During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level; – Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind; – Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO; – Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas; – Straw stabilisation must be applied at a rate of one bale/10 m^2 and harrowed into the top 100 mm of top material, for all completed earthworks; – For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.	Contractor	Regular dust suppression techniques conducted.	Construction	ESO ECO	Daily Fortnightly	Site inspection of areas susceptible to dust and ensure suppression techniques are conducted.

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5.21 Blasting

Impact Management outcome: impact to the environment is minimised through a safe and healthy blasting practice.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
– Any blasting activity must be conducted by a suitably licensed blasting contractor; and – Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site.	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

5.22 Noise

Impact Management outcome: Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
– The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only; – All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained; – Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers;	Contractor	Compliance with SANS 10103 and OHS Act Use of appropriate PPE	Construction	ESO ECO	Daily Fortnightly	Inspection of Complaints Register Site inspection

Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management outcome related to noise management.						

5.23 Fire prevention

Impact Management outcome: Prevention of uncontrollable fires.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
– Designate smoking areas where the fire hazard could be regarded as insignificant; – Firefighting equipment must be available on all vehicles located on site; – The local Fire Protection Agency (FPA) must be informed of construction activities; – Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site; – Two way swop of contact details between ECO and FPA.	Contractor	Awareness Training Designated smoking areas Services firefighting equipment Emergency numbers for Fire Protection Association displayed	Construction	ECO	Fortnightly	Site Inspection Records of fire-fighting training and drills Emergency numbers for Fire Protection Association displayed

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5.24 Stockpiling and stockpile areas

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

5.25 Finalising tower positions

Impact Management outcome: No environmental degradation occurs as a result of the survey and pegging operations.		
Impact Management Actions	**Implementation**	**Monitoring**

	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– No vegetation clearing must occur during survey and pegging operations; – No new access roads must be developed to facilitate access for survey and pegging purposes; – Project manager, botanical specialist and contractor to agree on final tower positions based on survey within assessed and approved areas; – The surveyor is to demarcate (peg) access roads/tracks in consultation with ECO. No deviations will be allowed without the prior written consent from the ECO.	Contractor	Method Statement	Construction	ECO	Monthly	Site Observation

5.26 Excavation and installation of foundations

Impact Management outcome: No environmental degradation occurs as a result of excavation or installation of foundations.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**

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– All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a licensed landfill site, if not used for backfilling purposes; – Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes; – Management of equipment for excavation purposes must be undertaken in accordance with ***Section 5.18: Workshop, equipment maintenance and storage***; and – Hazardous substances spills from equipment must be managed in accordance with ***Section 5.17: Hazardous substances***. – Batching of cement to be undertaken in accordance with ***Section 5.19 : Batching plants;*** – Residual cement must be disposed of in accordance with ***Section 5.8: Solid and hazardous waste management.***	Contractor	Preventative measures adhered to Engineering Drawings	Construction	ECO	Fortnightly	Site inspection

5.27 Assembly and erecting towers

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

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
– Prior to erection, assembled towers and tower sections must be stored on elevated surface (suggest wooden blocks) to minimise damage to the underlying vegetation; – In sensitive areas, tower assembly must take place off-site or away from sensitive positions; – The crane used for tower assembly must be operated in a manner which minimises impact to the environment;	Contractor	Method Statement	Construction	ECO	Fortnightly	Method Statement Site observation

– The number of crane trips to each site must be minimised; – Wheeled cranes must be utilised in preference to tracked cranes; – Consideration must be given to erecting towers by helicopter or by hand where it is warranted to limit the extent of environmental impact; – Access to tower positions to be undertaken in accordance with access requirements in specified in Section 8.4: Access Roads; – Vegetation clearance to be undertaken in accordance with general vegetation clearance requirements specified in Section 8.10: Vegetation clearing; – No levelling at tower sites must be permitted unless approved by the Development Project Manager or Developer Site Supervisor; – Topsoil must be removed separately from subsoil material and stored for later use during rehabilitation of such tower sites; – Topsoil must be stored in heaps not higher than 1m to prevent destruction of the seed bank within the topsoil; – Excavated slopes must be no greater that 1:3, but where this is unavoidable, appropriate measures must be undertaken to stabilise the slopes; – Fly rock from blasting activity must be minimised and any pieces greater than 150 mm falling beyond the Working Area, must be collected and removed; – Only existing disturbed areas are utilised as spoil areas; – Drainage is provided to control groundwater exit gradient with the spill areas such that migration of fines is kept to a minimum; – Surface water runoff is appropriately channeled through or around spoil areas; – During backfilling operations, care must be taken not to dump the topsoil at the bottom of the foundation and then put spoil on top of that;						

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– The surface of the spoil is appropriately rehabilitated in accordance with the requirements specified in Section 5.29: Landscaping and rehabilitation; – The retained topsoil must be spread evenly over areas to be rehabilitated and suitably compacted to effect revegetation of such areas to prevent erosion as soon as construction activities on the site is complete. Spreading of topsoil must not be undertaken at the beginning of the dry season.						

5.28 Stringing

Impact Management outcome: No environmental degradation occurs as a result of stringing						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**
– Where possible, previously disturbed areas must be used for the siting of winch and tensioner stations. In all other instances, the siting of the winch and tensioner must avoid Access restricted areas and other sensitive areas; – The winch and tensioner station must be equipped with drip trays in order to contain any fuel, hydraulic fuel or oil spills and leaks; – Refueling of the winch and tensioner stations must be undertaken in accordance with Section 5.17: Hazardous substances; – In the case of the development of overhead transmission and distribution infrastructure, a one metre "trace-line" may be cut through the vegetation for stringing purposes only and no	Contractor	Method Statement	Construction	ECO	Fortnightly	Site observation

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vehicle access must be cleared along "trace-lines". Vegetation clearing must be undertaken by hand, using chainsaws and hand held implements, with vegetation being cut off at ground level. No tracked or wheeled mechanised equipment must be used; – Alternative methods of stringing which limit impact to the environment must always be considered e.g. by hand or by using a helicopter; – Where the stringing operation crosses a public or private road or railway line, the necessary scaffolding/ protection measures must be installed to facilitate access. If, for any reason, such access has to be closed for any period(s) during development, the persons affected must be given reasonable notice, in writing; – No services (electrical distribution lines, telephone lines, roads, railways lines, pipelines fences etc.) must be damaged because of stringing operations. Where disruption to services is unavoidable, persons affected must be given reasonable notice, in writing; – Where stringing operations cross cultivated land, damage to crops is restricted to the minimum required to conduct stringing operations, and reasonable notice (10 work days minimum), in writing, must be provided to the landowner; – Necessary scaffolding protection measures must be installed to prevent damage to the structures supporting certain high value agricultural areas such as vineyards, orchards, nurseries.						

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5.29 Socio-economic

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

5.30 Temporary closure of site

Impact Management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.						
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	**Method of implementation**	**Timeframe for implementation**	**Responsible person**	**Frequency**	**Evidence of compliance**

– Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in ***sections 5.17: Hazardous substances and 5.18: Workshop, equipment maintenance and storage***; – Hazardous storage areas must be well ventilated; – Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service; – Emergency and contact details displayed must be displayed; – Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel; – Night hazards such as reflectors, lighting, traffic signage etc. must have been checked; – Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.; – Structures vulnerable to high winds must be secured; – Wind and dust mitigation must be implemented; – Cement and materials stores must have been secured; – Toilets must have been emptied and secured; – Refuse bins must have been emptied and secured; – Drip trays must have been emptied and secured.	Contractor	Preventative measures adhered to	Construction – when applicable	dEO ECO	Fortnightly	Site Inspections ECO Reports

5.31 Landscaping and rehabilitation

Management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.		
Impact Management Actions	**Implementation**	**Monitoring**

	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed of to a registered waste site; – All slopes must be assessed for contouring, and to contour only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983 – All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983; – Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition; – Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners; – Rehabilitation of access roads outside of farmland; – Indigenous species must be used for with species and/grasses to where it compliments or approximates the original condition; – Stockpiled topsoil must be used for rehabilitation (refer to ***Section 5.24: Stockpiling and stockpiled areas***); – Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion; – Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed; – Subsoil must be ripped before topsoil is placed; – The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment; – Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled;	Contractor Ecologist	Clean rehabilitated site free of litter and construction material	Concurrent with Construction Once-off	ECO Ecologist	Fortnightly Monthly, until rehabilitation ends	Site Inspection, Record Keeping and ECO Reports

MK

– Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly; – Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil. – Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described below. A mixture of seed can be used provided the mixture is carefully selected to ensure the following: a) Annual and perennial plants are chosen; b) Pioneer species are included; c) Species chosen must be indigenous to the area with the seeds used coming from the area; d) Root systems must have a binding effect on the soil; e) The final product must not cause an ecological imbalance in the area						

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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 regulation 26 (h) of the Environmental Impact Assessment Regulations, 2014.

PART B: SECTION 2

7. SITE SPECIFIC INFORMATION AND DECLARATION

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

7.1.1.Details of the applicant:

Name of applicant:	**Karpowership SA Proprietary Limited represented by Mehmet Katmer**
Tel No:	**+90 212 295 47 37 - 121**
Fax No:	**+90 212 295 47 43**
Email address:	**Mehmet.Katmer@karpowership.com**
Postal Address:	**Karpowership, Inanda Greens, Building 9, First Floor, 54; Wierda Road, Sandton**
Physical Address:	**Karpowership, Inanda Greens, Building 9, First Floor, 54; Wierda Road, Sandton**

7.1.2.Details and expertise of the EAP:

Name of EAP:	**Hantie Plomp, assisted by Chen Read**
Tel No:	**032 946 3213**
Fax No:	**Not applicable**
E-mail address:	**hantie@triplo4.com**

Expertise of the EAP (Curriculum Vitae included – Appendix 2):
Hantie Plomp: Masters Degree Environmental Management, Registered EAP and SACNASP registered, more than 20 years' experience in environmental management.

Chen Read: Postgraduate Diploma Environmental Management, Registered EAP, more than 10 years' experience in environmental management.

7.1.3.Project name:

The Gas to Power via Powership Project at Port of Richards Bay, uMhlatuze Local Municipality, Kwazulu-Natal

7.1.4.Description of project:

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The generated electricity, converted by the on-board High Voltage substation (capacity of 110 – 170kV) will be evacuated from the Powership via a double circuit twin Tern conductor 132kV transmission line over a distance of approximately 3.6km to the Switching Station. The electricity will be evacuated from the Powership to the Impala substation, via a connection point (necessitating a new switching station) in proximity to the existing Bayside Substation, which feeds electricity into the national grid.

The switching station will measure approximately 17 898m^2 in size and will comprise of an incoming circuit for the lines from the ship, a busbar system to distribute the electricity and an outgoing circuit for the electricity to Eskom. The switching station further comprises of landing gantries, breakers, isolators, current transformers, voltage transformers and a control room for the monitoring, measurement and control of the power.

Power will be transferred from the Shark Class Powership to the Khan Class Powership via an overhead connection to the towers which are already existing on the Powerships. The overhead line will span approximately 100m between the ships.

7.1.5.Project location:

Property Description	**CENTRAL GPS-COORDINATE**	
	Longitude	**Latitude**
Remainder of Lot 223 uMhlatuzi No.16230 N0GV00000001623000000	32°1'32.46"E	28°47'39.14"S
Portion 21 (of 8) of Erf 5333 Richards Bay N0GV04210000533300021	32°1'27.60"E	28°47'36.35"S
Portion 45 of Erf 5333 Richards Bay N0GV04210000533300045	32°1'10.78"E	28°47'22.84"S
Remainder of Erf 5333 Richards Bay N0GV04210000533300000	32°00'42.22"E	28°46'51.22"S
Remainder of Portion 8 of the Erf 5333 Richards Bay N0GV04210000533300008	32°1'27.60"E	28°47'36.35"S
Remainder of Erf 6363 Richards Bay N0GV04210000636300000	32°00'48.3"E	28°46'45.4"S

7.1.6.Preliminary technical specification of the overhead transmission distribution:

- Length – **3.6km**
- Tower parameters
  - Number and types of towers - **16 and Monopoles**

MK

- Tower spacing (mean and maximum) - **The maximum span is 307m with an average of 210m**
- Tower height (lowest, mean and height) - **The maximum height: 31m, mean height: 22m**
- Conductor attachment height (mean) - **as per Eskom-approved requirement and minimum clearance specifications**
- Minimum ground clearance - **as per Eskom-approved requirements and minimum clearance specifications**

Coordinates and areas of the proposed transmission line route

Alternative 1 (preferred)	**GPS-COORDINATE**			
	Left		**Right**	
	Longitude	**Latitude**	**Longitude**	**Latitude**
Start	32° 1'52.32"E	28°47'40.71"S	32° 1'49.71"E	28°47'39.14"S
Bend 1	32° 1'46.34"E	28°47'48.46"S	32° 1'45.23"E	28°47'44.85"S
Bend 2	32° 1'7.44"E	28°47'26.38"S	32° 1'11.10"E	28°47'24.78"S
Bend 3	32° 1'19.44"E	28°46'55.55"S	32° 1'23.20"E	28°46'54.38"S
Bend 4	32° 0'46.72"E	28°46'45.19"S	32° 0'44.99"E	28°46'42.04"S
Bend 5	-	-	32° 0'41.05"E	28°46'45.65"S
End	32° 0'43.48"E	28°46'52.68"S	32° 0'39.89"E	28°46'51.45"S

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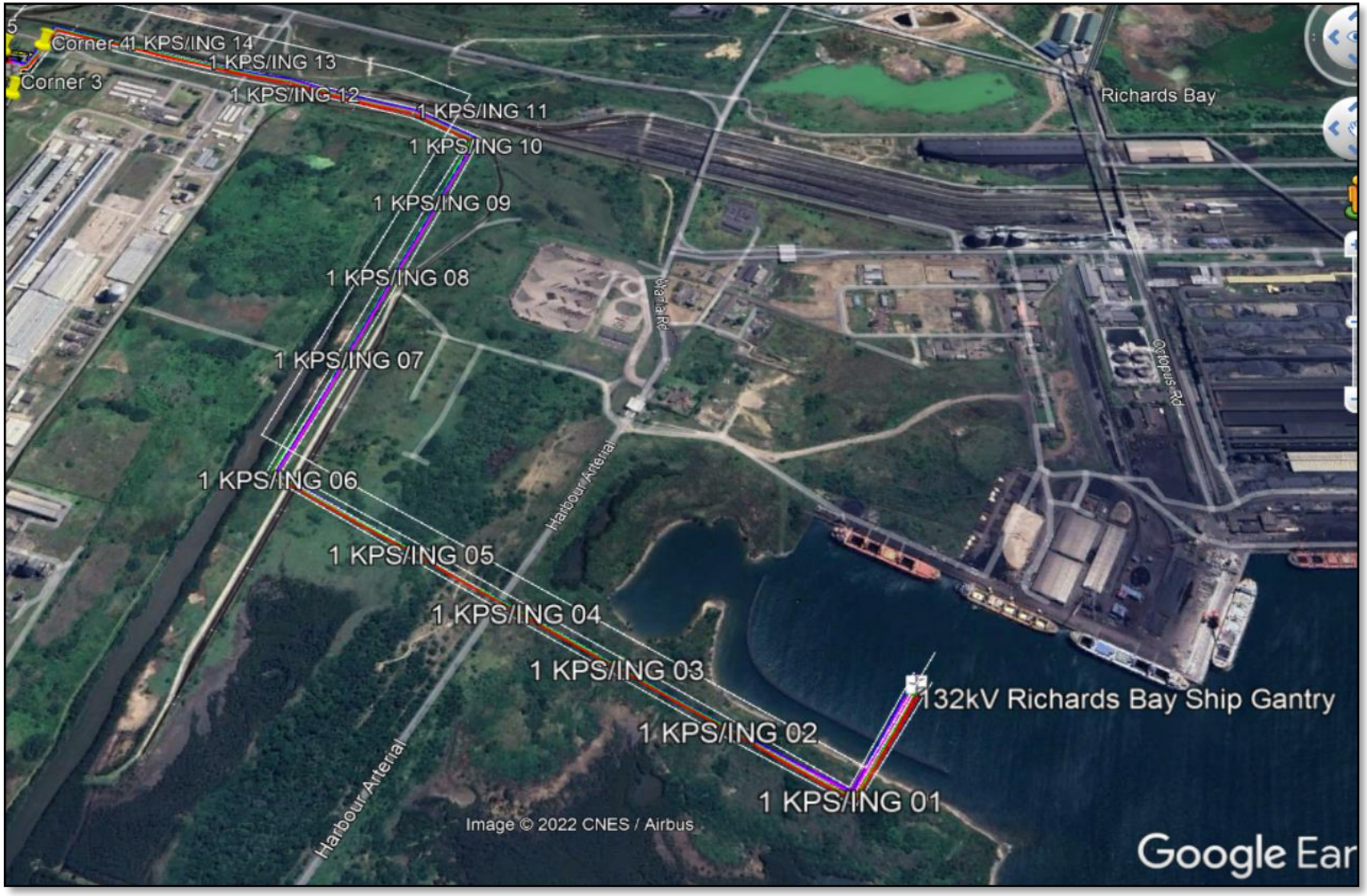

Figure 1. Transmission line route - Alternative 1 (preferred)

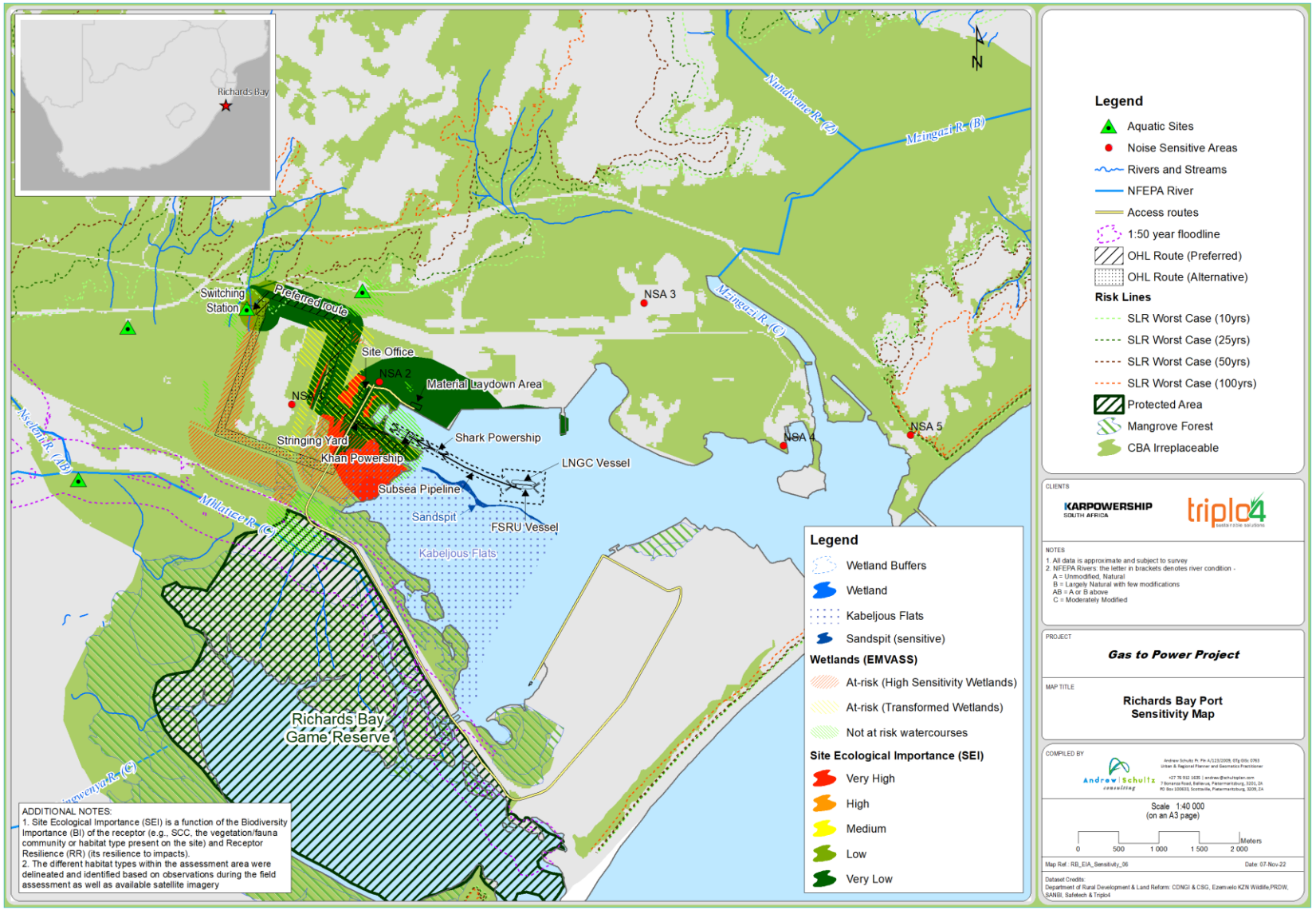

Figure 2. Sensitivity Map

7.2. Sub-section 2: Development footprint site map

Details and expertise of the EAP:

Name of EAP:	**Hantie Plomp, assisted by Chen Read**
Tel No:	**032 946 3213**
Fax No:	**Not applicable**
E-mail address:	**hantie@triplo4.com**

Expertise of the EAP (Curriculum Vitae included – Appendix 2):
Hantie Plomp: Masters Degree Environmental Management, Registered EAP and SACNASP registered, more than 20 years' experience in environmental management.

Chen Read: Postgraduate Diploma Environmental Management, Registered EAP, more than 10 years' experience in environmental management.

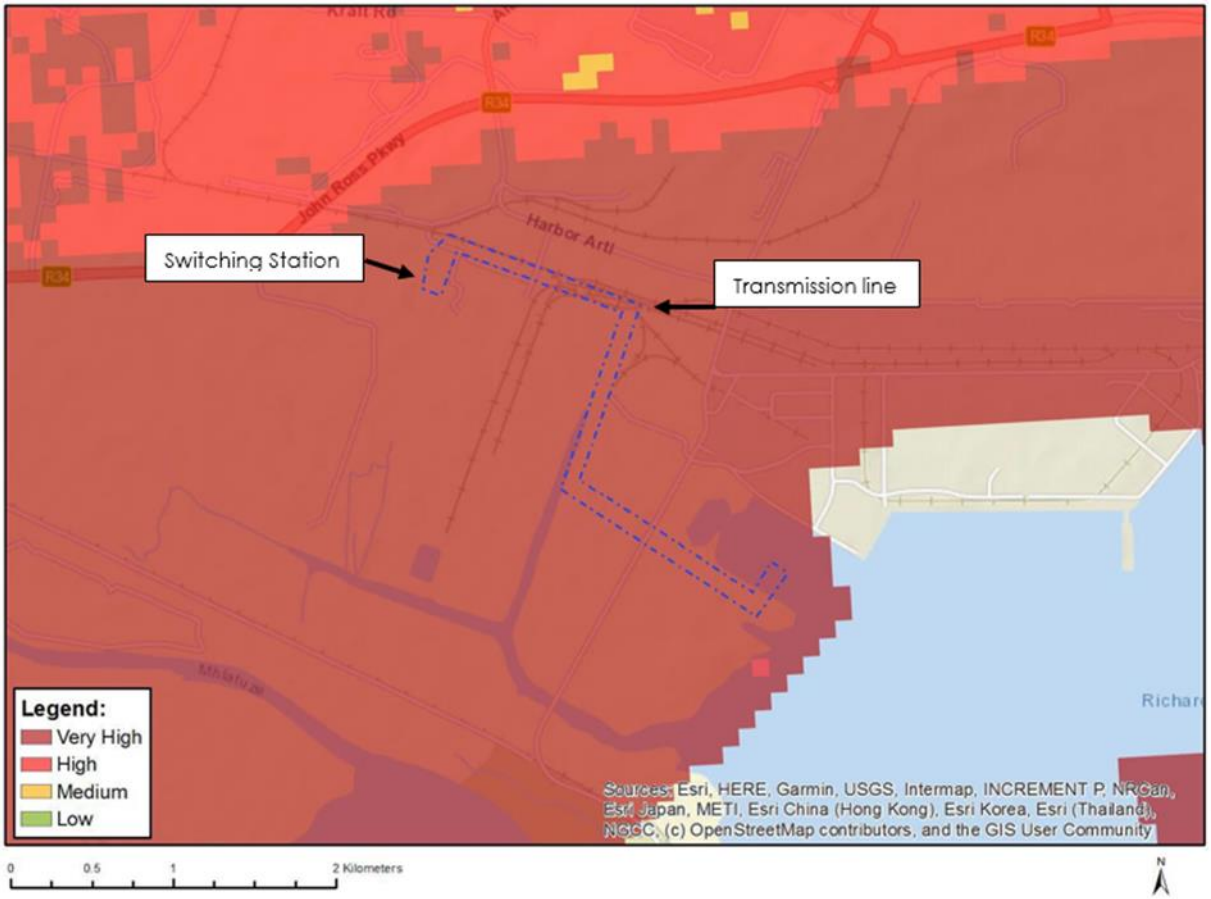

Figure 3. Agriculture theme sensitivity according to the DFFE national web-based screening tool

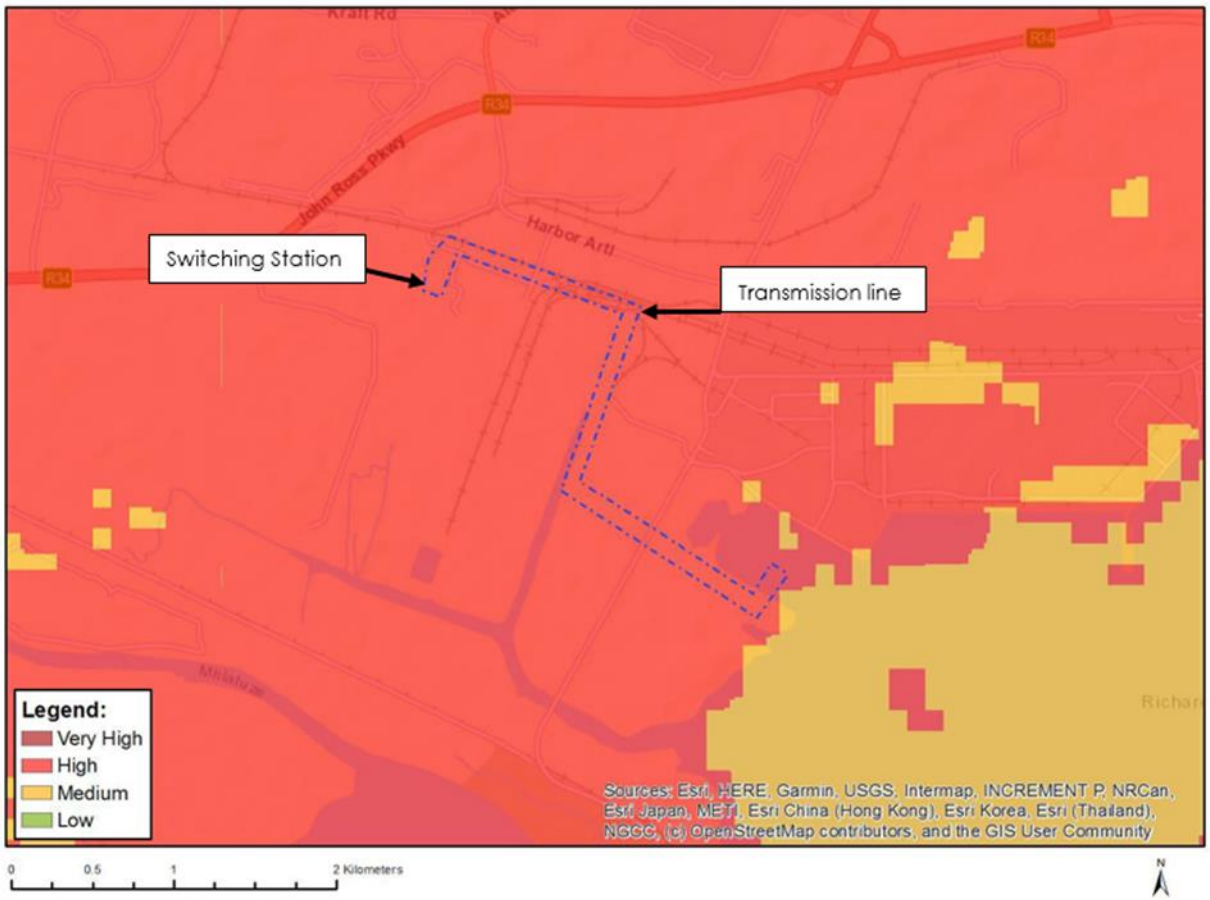

Figure 4. Animal theme sensitivity according to the DFFE national web-based screening tool

Figure 5. Aquatic Biodiversity theme sensitivity according to the DFFE national web-based screening tool

Figure 6. Archaeological and cultural heritage theme sensitivity according to the DFFE national web-based screening tool

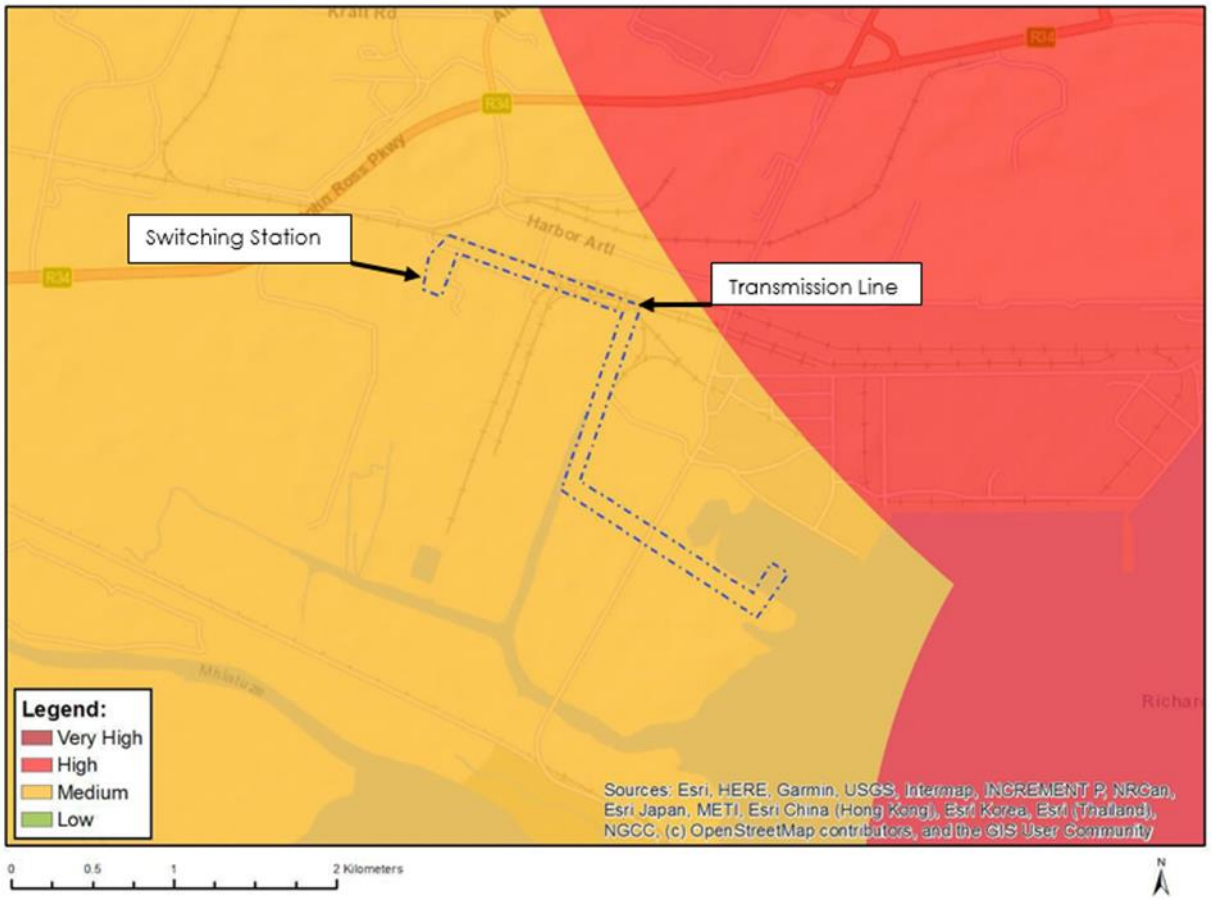

Figure 7. Civil aviation theme sensitivity according to the DFFE national web-based screening tool

Figure 8. Defense theme sensitivity according to the DFFE national web-based screening tool

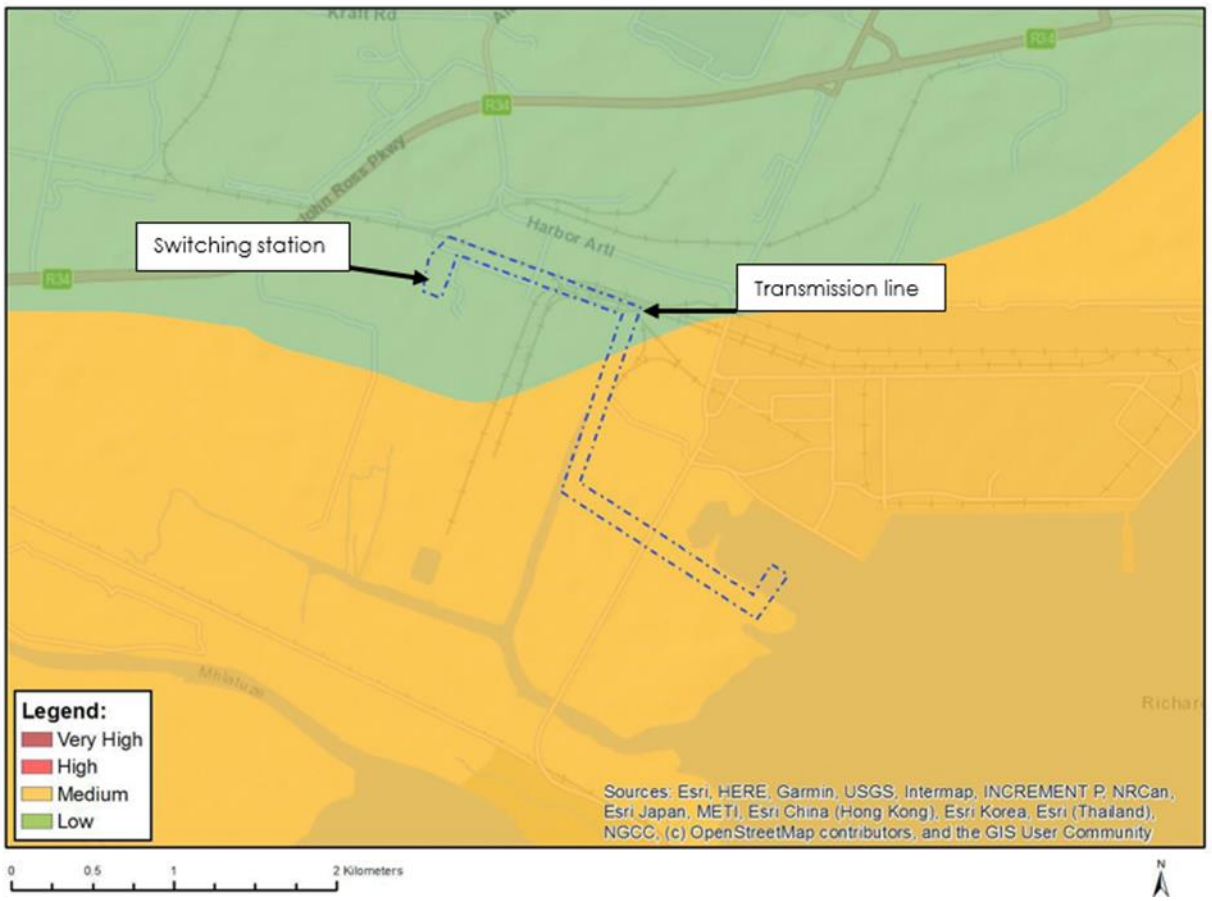

Figure 9. Paleontology theme sensitivity according to the DFFE national web-based screening tool

Figure 10. Plant species theme sensitivity according to the DFFE national web-based screening tool

Figure 11. Relative Terrestrial Biodiversity theme sensitivity according to the DFFE national web-based screening tool

7.3. Sub-section 3: Declaration

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

Signature Proponent/applicant/ holder of EA Date:

Katner 12.05.2023

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

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

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PART C

8. SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES

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

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8.1. Planning and Design Phase & Pre-Construction Activities

8.1.1 Environmental Training Awareness					
Impact Management Outcome: All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible person	**Method of implementation**	**Responsible Person**	**Frequency of monitoring**	**Mechanism for monitoring compliance**
1. All personnel should undergo environmental induction with regards to avifauna and in particular awareness about not harming, collecting, or hunting terrestrial species (e.g., guineafowl and francolin), and owls, which are often persecuted out of superstition. Signs must be put up to enforce this. 2. All construction and maintenance motor vehicle operators should undergo an environmental induction	ECO & Contractor	Weekly toolbox talks and awareness training	ECO	Monthly	Record of attendance to the toolbox talks and awareness training must be filed in the Site Environmental File

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that includes instruction on the need to comply with speed limit (40km/h), to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited 3. The cost-effective qualitative monitoring of the rehabilitation area may be time based through the use of periodic photographs taken from permanent photo points. These points are required to be established during site inception. The timeline created between the pre- and post-rehabilitation photos will provide an invaluable visual representation of the progress that is conveyed in a straightforward manner. The photographer should be an environmental scientist therefore allowing an expert assessment of the site adding to the qualitative information gathered from the photographs.	ECO & Contractor	Weekly toolbox talks and awareness training	ECO	Monthly	Record of attendance to the toolbox talks and awareness training must be filed in the Site Environmental File

8.1.2 Access restricted areas					
Impact Management Outcome: Impact on restricted areas are avoided through effective demarcation and management of these areas					
Impact Management Actions	**Implementation**		**Monitoring**		
1. A full site walk-through should be conducted in the summer prior to any construction activities to list all SCC and associated permits should be obtained for their	**Responsible person**	**Method of implementation**	**Responsible Person**	**Frequency of monitoring**	**Mechanism for monitoring compliance**

removal or transplantation. 2. All SCC must be compensated for at a ratio of at least 3:1 either in gardens or as part of restoration and conservation efforts within the Richards Bay IDZ.	Ecologist and ECO	Demarcation of sensitive areas with danger tape or barrier netting and identification of floral species of conservation concern	ECO	Daily Fortnightly	Site Inspection

8.1.3 Access Roads					
Impact Management Outcome: Construction vehicle movement is restricted to approved routes					
Impact Management Actions	**Implementation**		**Monitoring**		
1. Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads; 2. The use of existing servitudes/corridors must be discussed with the relevant landowners before construction commences. 3. Any new access roads must only be established after discussion with the relevant landowners before access to site. 4. As per the wetlands specialist recommendations: 5. Soft engineering (grassed swales (Teff Grass or Red Grass ideal for this climate)) instead of hard gutters should be used where possible. 6. Crossing structures utilised must be wide enough to allow diffuse, unhindered through-flow of the wetland systems and avoid impoundment upslope.	**Responsible person** Contractor	**Method of implementation** Access routes must be mapped prior to construction	**Responsible Person** ESO ECO	**Frequency of monitoring** Fortnightly	**Mechanism for monitoring compliance** Site Inspection

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7. Cut and fill must be avoided where possible during the set-up of the construction camp. The utilisation of the already heavily disturbed areas should be encouraged.					

8.2 Construction Phase Activities

8.2.1 Site Establishment					
Impact Management Outcome: Impacts relating to site establishment are minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
1. Herbicides should only be utilised where manually removing is not possible. Herbicides utilised are restricted to products which have been certified safe for use in	**Responsible person**	**Method of implementation**	**Responsible Person**	**Frequency of monitoring**	**Mechanism for monitoring compliance**

wetland areas by an independent testing authority. The ECO must be consulted before the purchase of any herbicide. 2. Water used on site must be from an approved source.	Contractor and ESO	Method Statement and layout of construction camps / laydown areas to be compiled and approved by the ECO	ECO	Once-off	Approved Method Statement and Layout Plan

8.2.2 Access roads					
Impact Management Outcome: Construction vehicle movement are restricted to approved routes to minimise disturbance					
Impact Management Actions	**Implementation**		**Monitoring**		
1. The access roads to tower positions must be signposted before the commencement of the activities; 2. The use of access roads and private roads must	**Responsible person**	**Method of implementation**	**Responsible Person**	**Frequency of monitoring**	**Mechanism for monitoring compliance**

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comply with all road legislation pertaining to driving including adhering to road safety standards. 3. Installation of new gates to be discussed with affected landowners to ensure that safety of access is considered and maintained.	Contractor	Access routes must be mapped prior to construction	ESO ECO	Fortnightly	Site Inspection

8.2.3 Fencing and gate installation					
Impact Management Outcome: Construction of fencing and gate should not occur within sensitive environments					
Impact Management Actions	**Implementation**		**Monitoring**		
1. 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.	**Responsible person**	**Method of implementation**	**Responsible Person**	**Frequency of monitoring**	**Mechanism for monitoring compliance**
	Contractor	Access routes must be mapped prior to construction	ESO ECO	Fortnightly	Site Inspection

8.2.4 Storm and waste water management					
Impact Management Outcome: Avoid, prevent and manage impacts related to storm and waste water.					
Impact Management Actions	**Implementation**		**Monitoring**		
1. It is recommended that sandbags and temporary berms be used, to manage stormwater runoff (if storms do	**Responsible person**	**Method of implementation**	**Responsible Person**	**Frequency of monitoring**	**Mechanism for monitoring**

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occur). Temporary stormwater systems must be sufficient to manage the stormwater at the site during construction. 2. Ensure that eroded areas are re-vegetated, to ensure reduced sedimentation risk and reduced runoff volumes to the streams. 3. The impoundment of water upslope due to the proposed development must be avoided. This is specifically relevant at the points where the proposed development will cross wetlands as per the current design (preferred alternative) and following wetlands: FP03 and UVB04. 4. Silt traps must be erected at the base of the slopes leading into the downstream wetlands and around all site camps, spill sites, access roads and temporary structures. Removal of sediment from the erected silt traps must take place on a weekly basis.					**compliance**
	Project Manager	Detailed SWMP, if any	ECO	Fortnightly	Approval of SWMP, if any

8.2.5 Protection of watercourses and estuaries					
Impact Management Outcome: Impact to watercourses and estuaries are managed in adherence to legislation and specialist recommendations					
Impact Management Actions	**Implementation**		**Monitoring**		
1. No return flow into the estuaries must be allowed and no disturbance of the Estuarine Functional Zone should occur; 2. Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available; 3. There must not be any impact on the long term morphological dynamics of watercourses or estuaries;	**Responsible person**	**Method of implementation**	**Responsible Person**	**Frequency of monitoring**	**Mechanism for monitoring compliance**
	Contractor	Demarcation of watercourses and sensitive areas	ECO	Fortnightly	Watercourses and sensitive areas are marked as restricted areas

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4. Existing crossing points must be favored over the creation of new crossings (including temporary access). 5. Mangrove and swamp forest habitat must be avoided. 6. 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 earthworks 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. 7. Temporary stormwater channels and preferential flow paths should be filled with aggregate and/or logs (branches included) to dissipate and slow flows limiting erosion. 8. If long periods of flow obstruction may be required,		maintaining the specified buffers			

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during periods of flow, intermitted releases of water, for a few hours every few days should be allowed for. 9. Water quality monitoring of the nearby river if there are visual signs of any sedimentation or surface pollution. 10. Install a temporary cut off trench to contain poor quality runoff. 11. Construction within and in the nearby vicinity of all watercourses or wetlands must proceed mainly during the dry, winter months where possible in order to minimize soil erosion linked to high runoff rates 12. Surface water monitoring if there are visual signs of soil pollution. 13. During the constructions of transmission lines within wetland areas, a Wetland Specialist must be present to ensure that construction are not entering sensitive environments (e.g: Mangrove Forest) and to ensure mitigation measures outlined in the Wetland Report are being followed. 14. In wetland areas including reed beds, the construction of berms should be avoided as far as possible. Construction measures must consist of the least impactful individual erection of monopole structures. No linear 3m corridors should be cleared of vegetation in these areas but individual drilled foundations used.					

8.2.6 Vegetation clearance		
Impact Management Outcome: Vegetation clearance and associated impacts are minimised		
Impact Management Actions	**Implementation**	**Monitoring**

General: 1. Search and Rescue plan must be developed for confirmation of those species of conservation concern that have a high probability of occurrence, and which will be impacted by the proposed infrastructure. 2. Construction measures must consist of the least impactful individual erection of monopole structures and all protected species avoided where possible. 3. A full site walk-through should be conducted prior to any construction activities to list all SSC and associated permits should be obtained for their removal or transplantation. 4. Should protected trees be disturbed by the proposed project, a compensation ratio of 1:5 will apply for each protected tree removed and it is the responsibility of the developer to determine the offsite area or to negotiated with the land owner for the area to plant those trees. 5. Transplantable indigenous trees or seedlings should be transplanted to a suitable place prior the commencement of the activities **Corridor:** 6. Vegetation that does not grow high enough to cause interference with overhead transmission and distribution infrastructures, or cause a fire hazard to any plantation, must not be cut or trimmed unless it is growing in the road access area, and then only at the discretion of the Project Manager; 7. Where clearing for access purposes is essential, the maximum width to be cleared within the corridor must	**Responsible person** Contractor Ecologist	**Method of implementation** Working within demarcated areas AIP eradication and control Once off	**Responsible Person** ESO ECO Ecologist	**Frequency of monitoring** Weekly Fortnightly Quarterly (per year)	**Mechanism for monitoring compliance** Site Inspection

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be in accordance to distance as agreed between the land owner and the EA holder 8. Alien invasive vegetation must be removed according to a plan (in line with relevant municipal and provincial procedures, guidelines and recommendations) and disposed of at a recognised waste disposal facility; 9. Vegetation must be trimmed where it is likely to intrude on the minimum vegetation clearance distance (MVCD) or will intrude on this distance before the next scheduled clearance. MVCD is determined from SANS 10280; 10. Debris resulting from clearing and pruning must be disposed of at a recognised waste disposal facility, unless the landowners wish to retain the cut vegetation; 11. In the case of the development of new overhead transmission and distribution infrastructures, a one metre "trace-line" must be cut through the vegetation for stringing purposes only and no vehicle access must be cleared along the "trace-line". Alternative methods of stringing which limit impact to the environment must always be considered. 12. A walk through of the site prior to any construction to determine the presence of any Species of Conservation Concern (this is currently underway). 13. Application for permits for removal of any SCC where required (this is currently underway). 14. All working areas must be demarcated with safety tape and site construction disturbances be limited to within the demarcated area to prevent disturbing a wider					

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area. 15. Felled trees must be stockpiled and not prevent movement off vehicles, people and drainage lines. 16. Landowners are to be notified about wood stockpiles and for the wood to be given away or taken to a dedicated vegetation waste collection site. 17. Notifying the landowner about wood stockpiles prevents contractors being sued in case of fire which the stockpile can be biomass fuel of the rampant fire. 18. A record of notification from the landowner with regards to wood stockpiling must be kept at the construction site. 19. The use of herbicides to treat stumps must be in line with the approved Eskom Vegetation Management standard. 20. In natural areas, the construction of a corridor should be avoided wherever possible. Construction measures must consist of the least impactful individual erection of monopole structures. No linear 3m corridors should be cleared of vegetation in these areas but individual drilled foundations used.					

8.2.7 Protection of fauna					
Impact Management Outcome: Impacts on fauna are minimized through adherence to EMPr requirements.					
Impact Management Actions	**Implementation**		**Monitoring**		
1. A total of 12-month monitoring have been conducted over the period 2020-2023 as part of pre-construction baseline monitoring. A second 12-month post	**Responsible person**	**Method of implementation**	**Responsible Person**	**Frequency of monitoring**	**Mechanism for monitoring compliance**

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construction monitoring programme will commence as soon as construction is complete. 2. Results from the monitoring will inform implementation of and any enhancement to the proposed mitigation measures to ensure the development does not have a long-term impacts on the SCCs and migratory waders in the area. 3. A follow-up assessment on avian biodiversity and species abundance within the assessment area and surrounding areas must be conducted within one year after the facility has been in operation and should be repeated every 3-5 years. A monitoring plan has been developed for the site and monitoring is currently ongoing. Information obtained from the monitoring must be provided to BirdLife Renewable Energy Programme on energy@birdlife.org.za. The data must be presented as described in Jenkins et al., 2017. 4. All project activities must be undertaken with appropriate noise mitigation measures to avoid disturbance to avifauna population in the region. 5. A walk-though must be done prior to construction to locate any nests, especially of any Species if Conservation Concern, which then should be dealt with on a case-by-case basis by an avifauna specialist. 6. The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the construction programme; 7. 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;	Contractor Ecologist	Awareness Training Injuring, capturing, killing of animals identified on site must be reported as an environmental incident and investigated Once off	ECO Ecologist Avian Specialist	Fortnightly Quarterly (per year) Monthly, for a minimum of 12 months	Training material relating to wildlife management

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line as per the recommendations of the Avifauna specialist; 9. Add bird diverters to all sections of the line as it goes up. 10. Design the over-water line to stop birds perching on it and to stop them colliding with it (via diverters). 11. All new overhead pylons must be made bird-friendly to avoid electrocutions. 12. The use of static or dynamic marking devices can make the lines more conspicuous (particularly earth-wires). Various marking devices (spirals, bird flappers) have been used globally, and those tested reduce collisions between 50% and 92% relative to un-mitigated controls. 13. All pylons must follow the approved bird-friendly design to avoid electrocution of any species. 14. Avoid any active nests (some ground-nesters may be found on the beach). 15. Avoid polluting the area with plastics or human waste – all material to be disposed of in suitable receptacles. 16. Reduce the extent of human disturbance around the transmission line. 17. Speed limits should be posted and not exceed 40km/hr, especially at night when nocturnal and crepuscular species tend to rest on roads. 18. The monitoring must include the following (as per BARESG guidelines): a. Construction monitoring should be started as the lines are erected;					

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b. All carcasses should be photographed with a GPS, in situ, and identified and recorded. c. The search area should be defined and consistently applied throughout the monitoring period; 19. Where avian fatalities are found to occur (i) to Red Data species, or (ii) at unacceptably high levels, to priority species, then the mitigation measures in the monitoring BARESG guidelines must occur. 20. Outside lighting should be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided and sodium vapor (red/green) motion detection lights should be used wherever possible.					

8.2.8 Protection of heritage resources					
Impact Management Outcome: Impacts on heritage resources are minimised through adherence to EMPr requirements.					
Impact Management Actions	**Implementation**		**Monitoring**		
1. In terms of the heritage aspect, no sites were recorded for possible finds. 2. No heritage sites have been recorded in the study area. The project should be exempt from further HIA mitigation, especially for the maritime aspect since the harbour dredging removed all potential heritage deposits. A Chance Find protocol will be initiated during construction.	**Responsible person**	**Method of implementation**	**Responsible Person**	**Frequency of monitoring**	**Mechanism for monitoring compliance**
	Contractor	Awareness Training Injuring, capturing, killing of animals	ECO	Fortnightly	Training material relating to wildlife management

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3. As a precaution, the following mitigation measures must be noted, in the case of a heritage find on site. 4. The rescue of fossils during earth works critically depends on spotting this material immediately as it is uncovered. The contractor must carry out general monitoring of excavation activity for potential fossils, artefacts and material of heritage importance; 5. All work must cease immediately, if any human remains and/or other archaeological, paleontological and historical material are uncovered. Such a find must be reported to the ECO. 6. The subsequent process to be followed in the case of a find is: It must be reported to the nearest museum, archaeologist/ paleontologist (or the South African Police Services). Sufficient time must be allowed to remove/collect such material before construction recommences. 7. Identify and appoint stand-by paleontologist should paleontological finds be uncovered by earthworks. 8. Construction personnel to be alert for rare fossil bones and follow a Fossil Finds Procedure. 9. Exposed fossiliferous sections in earthworks must be recorded and sampled by appointed paleontologist. 10. The Environmental Control Officer (ECO) and contractor must inform staff of the need to watch for potential fossil occurrences as part of the Environmental Awareness training. 11. In the case of a significant find, a paleontologist must undertake the recording of the stratigraphic context and sedimentary geometry of the exposure and the compilation of the report to Heritage KZN.	Paleontologist /Archeologist	identified on site must be reported as an environmental incident and investigated Once off			

8.2.9 Workshop, equipment maintenance and storage					
Impact Management outcome: Soil, surface water and groundwater contamination is minimised.					
Impact Management Actions	**Implementation**		**Monitoring**		
1. As per the Hydrology specialist report, it is recommended that all vehicles are in good working order when entering the site (i.e., visual observations of any leakages that may emanate from the vehicle accessing the site) and parked in designated areas with drip trays. Weekly inspection of vehicles should be sufficient.	**Responsible person**	**Method of implementation**	**Responsible Person**	**Frequency of monitoring**	**Mechanism for monitoring compliance**
	Contractor	Bunding of storage sites and inspection of equipment	ESO ECO	Daily Fortnightly	Site inspection and maintenance of onsite equipment

8.2.10 Noise					
Impact Management Outcome: Noise management is undertaken in accordance with SANS 10103 and the Occupational Health and Safety Act (Act No. 85 of 1993)					
Impact Management Actions	**Implementation**		**Monitoring**		
1. All project activities must be undertaken with appropriate noise mitigation measures to avoid disturbance to avifauna population in the region.	**Responsible person**	**Method of implementation**	**Responsible Person**	**Frequency of monitoring**	**Mechanism for monitoring compliance**

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2. All construction operations should only occur during daylight hours if possible. Should the construction programme necessitate night shift work, permission must be sought via the ECO and Engineer. 3. No construction piling may occur at night. Piling must only occur during the day to take advantage of unstable atmospheric conditions. 4. Construction staff must receive "noise sensitivity" training such as switching off vehicles when not in use, as part of the Environmental Awareness training / Toolbox Talks. 5. An ambient noise survey should be conducted at the noise sensitive receptors during the construction phase.	Contractor	Compliance with SANS 10103 and OHS Act Use of appropriate PPE	ESO ECO	Daily Fortnightly	Inspection of Complaints Register Site inspection

8.2.11 Finalising tower position					
Impact Management outcome: No environmental degradation occurs as a result of the survey and pegging operations.					
Impact Management Actions	**Implementation**		**Monitoring**		
1. Add bird diverters or spirals (diurnal and nocturnal) to all new lines, to reduce fatality rates by 50% 2. Ensure all electrical infrastructure is bird-friendly to avoid electrocutions. 3. Marking, with bird diverters, all new overhead power lines that cannot run parallel with the existing lines. 4. The existing pylon servitude adjacent to the Manzamnyama Canal and the existing berms must be used as the preferred route to minimise the disturbance footprint to the adjacent intertidal sand/mudflats of the canal.	**Responsible person** Contractor Ecologist	**Method of implementation** Preventative measures adhered to Once off	**Responsible Person** ECO	**Frequency of monitoring** Fortnightly	**Mechanism for monitoring compliance** Site inspections

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5. The design of the proposed transmission line must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa (Jenkins et al., 2017). 6. Infrastructure should be consolidated where possible in order to minimise the amount of ground and air space used. 7. All the parts of the infrastructure must be nest proofed and anti-perch devices placed on areas that can lead to electrocution. 8. Any exposed parts must be covered (insulated) to reduce electrocution risk. 9. Follow existing routes where possible, staggering pylons and aligning transmission lines with existing lines, or setting the lines low.					

8.2.12 Stringing					
Impact Management outcome: No environmental degradation occurs as a result of stringing.					
Impact Management Actions	**Implementation**		**Monitoring**		
1. Where possible, previously disturbed areas must be used for the siting of winch and tensioner stations. In all other instances, the siting of the winch and tensioner	**Responsible person**	**Method of implementation**	**Responsible Person**	**Frequency of monitoring**	**Mechanism for monitoring compliance**

must avoid Access restricted areas and other sensitive areas; 2. The winch and tensioner station must be equipped with drip trays in order to contain any fuel, hydraulic fuel or oil spills and leaks; 3. Refueling of the winch and tensioner stations must be undertaken in accordance with Section 8.3.15: Hazardous substances; 4. In the case of the development of overhead transmission and distribution infrastructure, a one metre "trace-line" may be cut through the vegetation for stringing purposes only and no vehicle access must be cleared along "trace-lines". Vegetation clearing must be undertaken by hand, using chainsaws and hand held implements, with vegetation being cut off at ground level. No tracked or wheeled mechanised equipment must be used; 5. Alternative methods of stringing which limit impact to the environment must always be considered e.g. by hand or by using a helicopter; 6. Where the stringing operation crosses a public or private road or railway line, the necessary scaffolding/ protection measures must be installed to facilitate access. If, for any reason, such access has to be closed for any period(s) during development, the persons affected must be given reasonable notice, in writing; 7. No services (electrical distribution lines, telephone lines, roads, railways lines, pipelines fences etc.) must be damaged because of stringing operations. Where disruption to services is unavoidable, persons affected must be given reasonable notice, in writing.	Contractor	Preventative measures adhered to	ECO	Fortnightly	Site inspections

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8. Where stringing operations cross cultivated land, damage to crops is restricted to the minimum required to conduct stringing operations, and reasonable notice (10 work days minimum), in writing, must be provided to the landowner.					

8.2.13 Landscaping, rehabilitation, and monitoring					
Impact Management Outcome: Post-construction and rehabilitation activities are undertaken in accordance with EMPR requirements					
Impact Management Actions	**Implementation**		**Monitoring**		
	Responsible person	**Method of implementation**	**Responsible Person**	**Frequency of monitoring**	**Mechanism for monitoring compliance**
1. Development and implementation of an alien invasive plant species management plan, which would remove and control the alien vegetation within and bordering the site. 2. The land beneath the transmission line, and any other areas required for construction, but not for the operational phase, should be rehabilitated with indigenous species to retain connectivity within the system. 3. The development of a rehabilitation plan in line with port expansion plans and in conjunction with Transnet and the IDZ. 4. Monitoring plan of alien invasive plants must be implemented to prevent streamflow reduction on the Mhlatuze River. 5. Management interventions: Where avian fatalities are found to occur (i) to Red Data species, or (ii) at	Contractor Ecologist	Clean rehabilitated site free of litter and construction material Once off	ECO Ecologist Avian Specialist	Fortnightly Monthly (until closure of rehab) Monthly, minimum of 12months	Site Inspection, Record Keeping and ECO Reports

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unacceptably high levels, to priority species, then the mitigation measures detailed above, should be brought into play. 6. We encourage the developers to release the results of the annual monitoring to the Endangered Wildlife Trust-Eskom partnership to be collated and assessed. In this way cumulative impacts assessments, currently crudely estimated, can be refined, region by region. 7. Disturbance around tower establishment and erection areas must be rehabilitated. 8. Rehabilitation must include application of stored topsoil to not more than 30mm to support growth. 9. Indigenous grass seed mixture can be applied onto the topsoil and raked into soil. 10. The topsoil must be slightly compacted to encourage adherence of soil material thus preventing potential erosion. **11.** In terms of rehabilitation, this must be done with local supplier. 12. The establishment and infestation of AIPs must be prevented, managed and eradicated in the areas impacted upon by the proposed construction activities by a horticulturist for the period stipulated in the Wetland Rehabilitation Plan. 13. The type of species and location of that species will determine the type of methodology required for its management and eradication. This methodology should target all lifecycle phases and propagules of the specific species, e.g. seedlings/saplings, seeds, roots. 14. The cost-effective qualitative monitoring of the					

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rehabilitation area may be time based through the use of periodic photographs taken from permanent photo points. These points are required to be established during site inception. The timeline created between the pre- and post-rehabilitation photos will provide an invaluable visual representation of the progress that is conveyed in a straightforward manner. The photographer should be an environmental scientist therefore allowing an expert assessment of the site adding to the qualitative information gathered from the photographs. 15. The Wetland Rehabilitation Plan, dated October 2022, must be implemented.					

8.2.14 Socio-economic					
Impact Management outcome: Socio-economic development is enhanced					
Impact Management Actions	**Implementation**		**Monitoring**		
1. A social development and economic development programme should be devised by the developer throughout the project's lifespan. 2. The plan should be developed in consultation with local authorities and local communities to identify community projects that would result in the greatest social benefits. 3. These plans should be reviewed on an annual basis and, where necessary, updated.	**Responsible person**	**Method of implementation**	**Responsible Person**	**Frequency of monitoring**	**Mechanism for monitoring compliance**
	Operations Manager, Project Manager and Engineer	Interview process	Operations Manager	Fortnightly	Site inspections

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4. When identifying enterprise development initiatives, the focus should be on creating sustainable and self-sufficient enterprises. 5. In devising the programmes to be implemented, the developer should consider the priorities set out in the local IDP. 6. Use of local community for labour is encouraged, where possible. 7. Access into office, camp site and work area must be controlled to prevent accidents. 8. A register of visitors must be kept. 9. All health standards must be adhered to. 10. New temporary workers must be trained on environmental issues and management as well as on safety standards.					

8.2.15 Monitoring, Reporting, Record Keeping & Compliance					
Impact Management Outcome: Impact to the operational site and surrounding areas are minimal as result of adherence to the authorisations and EMPr.					
Impact Management Actions:	**Implementation**		**Monitoring**		
1. Compliance must be ensured with all monitoring, auditing, reporting and record keeping requirements as per approved environmental authorisations e.g. (EA, permits, licenses and amendments there to), programmes and plans (e.g. monitoring programmes). 2. Environmental monitoring must be undertaken by the ECO on a fortnightly basis.	**Responsible Person/s**	**Method of Implementation**	**Responsible Person**	**Frequency of Monitoring**	**Mechanism for Monitoring Compliance**
	Operations Manager and Project Manager	Establish registers, record of receipts, environmental file	ECO	Fortnightly	Site inspections

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3. An Environmental Audit Report to be completed by an external auditor, in accordance with the requirements of regulation 34 of the NEMA EIA Regulations, 2014 (as amended). 4. This monitoring must be undertaken in order to ensure compliance with all aspects or requirements of the EMPr and Environmental Authorisations. 5. The noise impact from the proposed project should be measured during the operational phase, to ensure that the impact is within the required legal limit. 6. Management interventions: Where avian fatalities are found to occur (i) to Red Data species, or (ii) at unacceptably high levels, to priority species, then the following mitigation measures should be brought into effect: a. Construction monitoring should be started as the lines are erected; b. Post-construction monitoring should estimate bird mortalities along the entire 4.5-km of power line c. All carcasses should be photographed with a GPS, in situ, and identified and recorded. d. The search area should be defined and consistently applied throughout the monitoring period; e. Post-construction monitoring of bird abundance and movements and fatality surveys should span a minimum of 12 months.					

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7. Monitoring must be done to determine the rate of electrocution, as well as which species are affected. 8. Monopoles and lines must be regularly checked for any faults that may result in increased risk of electrocution. 9. New lines should be monitored monthly for a year to determine avifaunal mortality as a result of collisions and adaptive management techniques put in place to reduce impacts, or confirmation of low mortality levels. 10. The use of registered landfill sites must be utilised and waste disposal volumes must be recorded and documented proof kept on the site Environmental File. 11. Monitoring of noise levels at the sandspit is recommended at least monthly during operation so these can be compared to the changes in bird populations, if any. 12. An avifauna monitoring plan must be developed and implemented for both the ship and transmission lines. 13. All lighting should be downlighting. 14. No lights should be directed at the sandspit or Kabeljous flats. 15. Light monitoring should be done monthly both pre- and post-construction along with avifaunal monitoring to determine change over time.					

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8.3 Post-Construction and Operational Phase Activities - ESKOM

8.3.1 Maintenance of servitude and related infrastructure					
Impact Management Outcome: Environmental impacts during the Operation & Maintenance Phase for the Transmission Line will be effectively mitigated					
Impact Management Actions:	**Implementation**		**Monitoring**		
1. Erosion control and alien invasive management plan must be compiled. 2. Where possible, existing access routes and walking paths must be made use of. 3. No dedicated buffer areas were identified as part of this hydropedology assessment, as the predicted impacts associated with the proposed activity on the hydropedological environment are deemed low to neutral. It is however proposed to maintain the operational phase buffer (working servitude) for any vehicles servicing the transmission line. 4. In accordance with the Hydrology report, no dedicated groundwater monitoring is required. Regular (monthly or during maintenance runs) visual assessments of the transmission lines and switching station should be however be conducted (i.e. signs of oil spills, sediment runoff, switching station leakages etc.) to monitor potential pollution. 5. Sampling the non-perennial, wetlands and perennial streams downstream of the site will help to determine if the repair/maintenance activities are impacting the	**Responsible Person/s**	**Method of Implementation**	**Responsible Person**	**Frequency of Monitoring**	**Mechanism for Monitoring Compliance**
	Operations Manager and Project Manager and Engineer	Standard Operating Procedures	ECO	Fortnightly	Site inspections

surface water quality (only if visual observations support potential pollution). 6. A fire management plan needs to be compiled and implemented to restrict the impact fire might have on the surrounding areas.					

8.3.2 Access control & Socio-economic					
Impact Management Outcome: Environmental impacts during the Post Construction and Operation & Maintenance Phase for the Transmission Line will be effectively mitigated.					
Impact Management Actions:	**Implementation**		**Monitoring**		
1. 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. 2. Environmentally friendly dust suppressants need to be utilised.	**Responsible Person/s**	**Method of Implementation**	**Responsible Person**	**Frequency of Monitoring**	**Mechanism for Monitoring Compliance**
	Operations Manager and Project Manager and Engineer	Standard Operating Procedures	ECO	Fortnightly	Site inspections

8.3.3 Fauna		
Impact Management Outcome: Environmental impacts during the Post Construction and Operation & Maintenance Phase for the Transmission Line will be effectively mitigated		
Impact Management Actions:	**Implementation**	**Monitoring**

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8.3.3 Fauna					
Impact Management Outcome: Environmental impacts during the Post Construction and Operation & Maintenance Phase for the Transmission Line will be effectively mitigated					
Impact Management Actions:	**Implementation**		**Monitoring**		
1. A total of 12-month monitoring have been conducted over the period 2020-2023 as part of pre-construction baseline monitoring. A second 12-month post construction monitoring programme will commence as soon as construction is complete. 2. Results from the monitoring will inform implementation of and any enhancement to the proposed mitigation measures to ensure the development does not have a long-term impacts on the SCCs and migratory waders in the area. 3. A follow-up assessment on avian biodiversity and species abundance within the assessment area and surrounding areas must be conducted within one year after the facility has been in operation and should be repeated every 3-5 years. A monitoring plan has been developed for the site and monitoring is currently ongoing. Information obtained from the monitoring must be provided to BirdLife Renewable Energy Programme on energy@birdlife.org.za. The data must be presented as described in Jenkins *et al.,* 2017. 4. All project activities must be undertaken with appropriate noise mitigation measures to avoid disturbance to avifauna population in the region.	**Responsible Person/s**	**Method of Implementation**	**Responsible Person**	**Frequency of Monitoring**	**Mechanism for Monitoring Compliance**
	Operations Manager and Project Manager and Engineer	Standard Operating Procedures	ECO	Fortnightly	Site inspections

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5. All project activities must be undertaken with appropriate noise mitigation measures to avoid disturbance to avifauna population in the region. 6. All pylons must be monitored for being bird-friendly (conductors slung below the towers) to avoid electrocution. 7. The 3.6km of overhead power line's diurnal-nocturnal diverters (night time solar bird diverters) must remain in place. 8. Post construction monitoring should be undertaken by competent ornithologists familiar with the area's threatened species. 9. 12-month baseline avifaunal monitoring of the sandspit and Kabeljous flats. 10. Waterbird counts of the full site including both Richards Bay Port and the Richards Bay Game Reserve should resume and continue annually in both summer and winter. 11. The monitoring plan for the avifauna should speak to the existing monitoring plans of the port, if no such documents are available, Karpowership can contribute to them. 12. Monitoring must be done in conjunction with all port users and the TNPA as cumulative impacts are likely to be the most detrimental to such habitats. 13. An agreement must be concluded with EKZNW on an appropriate biodiversity offset to compensate for residual impacts on waterbirds that cannot be effectively avoided, minimised, or mitigated through implementation of measures. It is noted that an agreement has been developed with input from EKZNW and is detailed in Chapter 7 of the EIA Report.					

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2. Some Species of Conservation Concern are present just outside the Transmission Line route(s). Although a higher risk during construction, care must be taken that they are not damaged / removed during maintenance to infrastructure. 3. The relevant specialist recommends Conservation of the sandspit and Kabeljous flats, and that no development should take place in these areas. An adaptively managed conservation plan should be developed for these areas in particular that aligns with the existing TNPA conservation management plan for the port. If no such document exists, KPS partnership with SANPARKS and EZEMVELO should have input into its development. 4. The cost-effective qualitative monitoring of the rehabilitation area may be time based through the use of periodic photographs taken from permanent photo points. These points are required to be established during site inception. The timeline created between the pre- and post-rehabilitation photos will provide an invaluable visual representation of the progress that is conveyed in a straightforward manner. The photographer should be an environmental scientist therefore allowing an expert assessment of the site adding to the qualitative information gathered from the photographs. 5. The Wetland Rehabilitation Plan, dated October 2022, must be implemented.	Manager and Engineer				

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8.4 Spatially Referenced Specific Management Controls

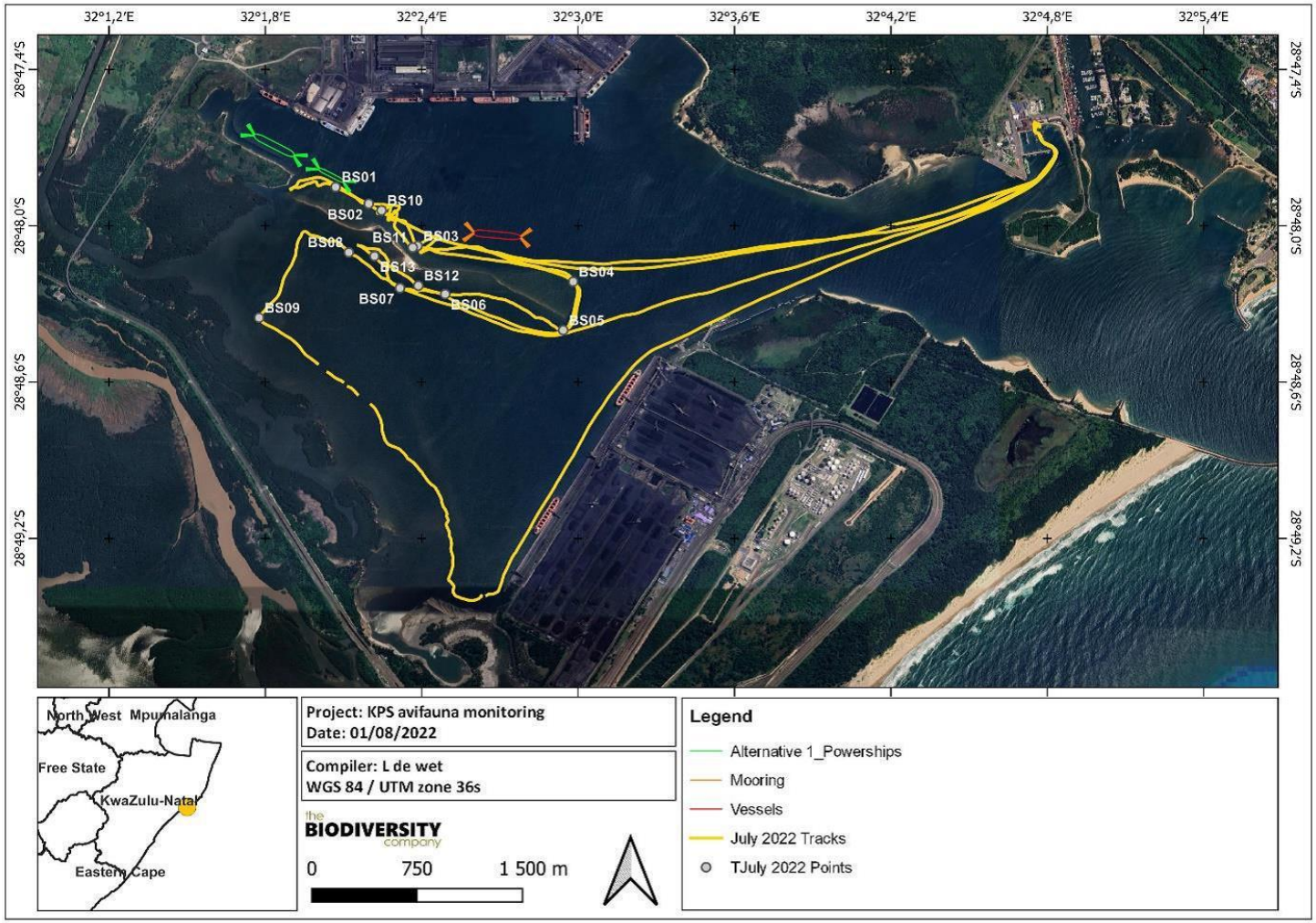

Figure 12. Map of recommended sampling points. BS01 to BS09 being low tide, with BS10 to BS14 being high tide

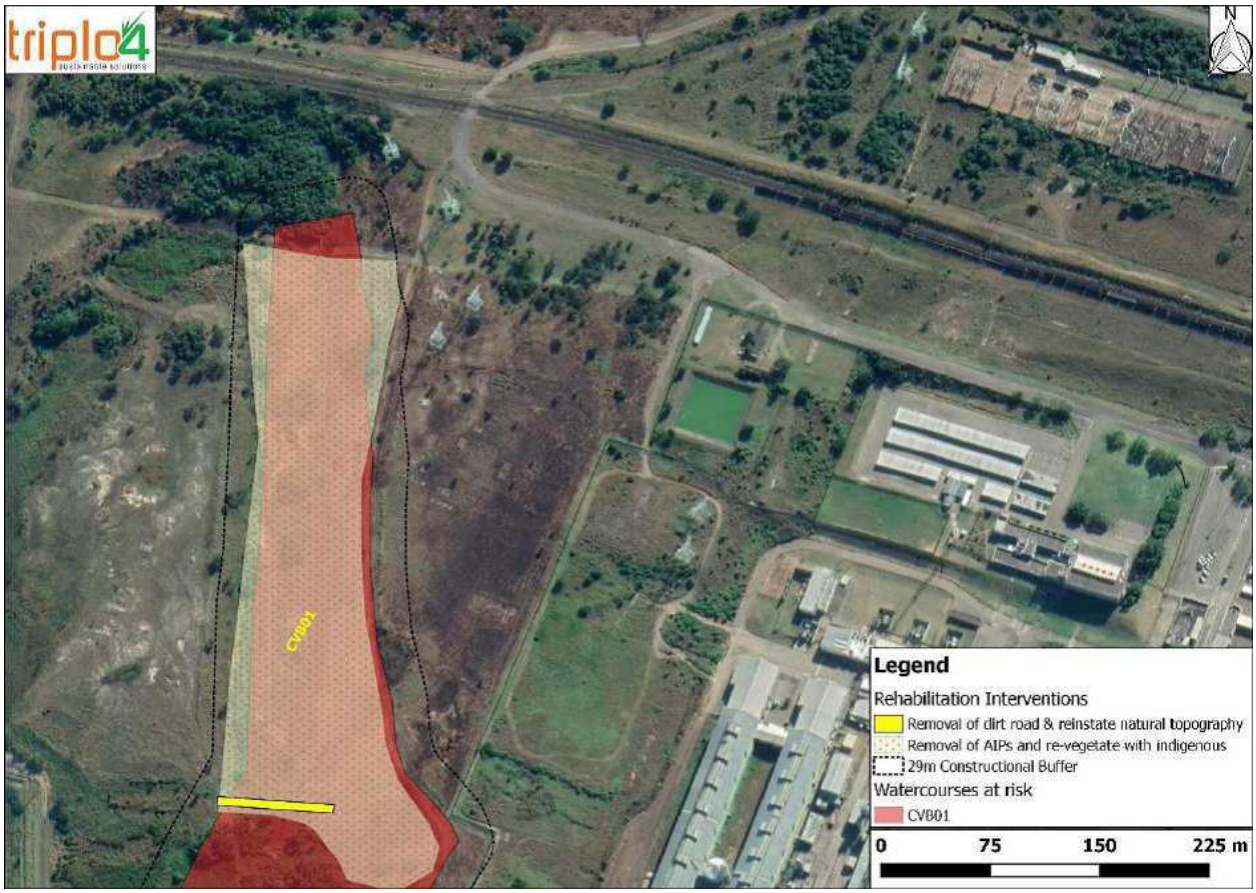

Figure 13. Map of the rehabilitation strategy for CVB01

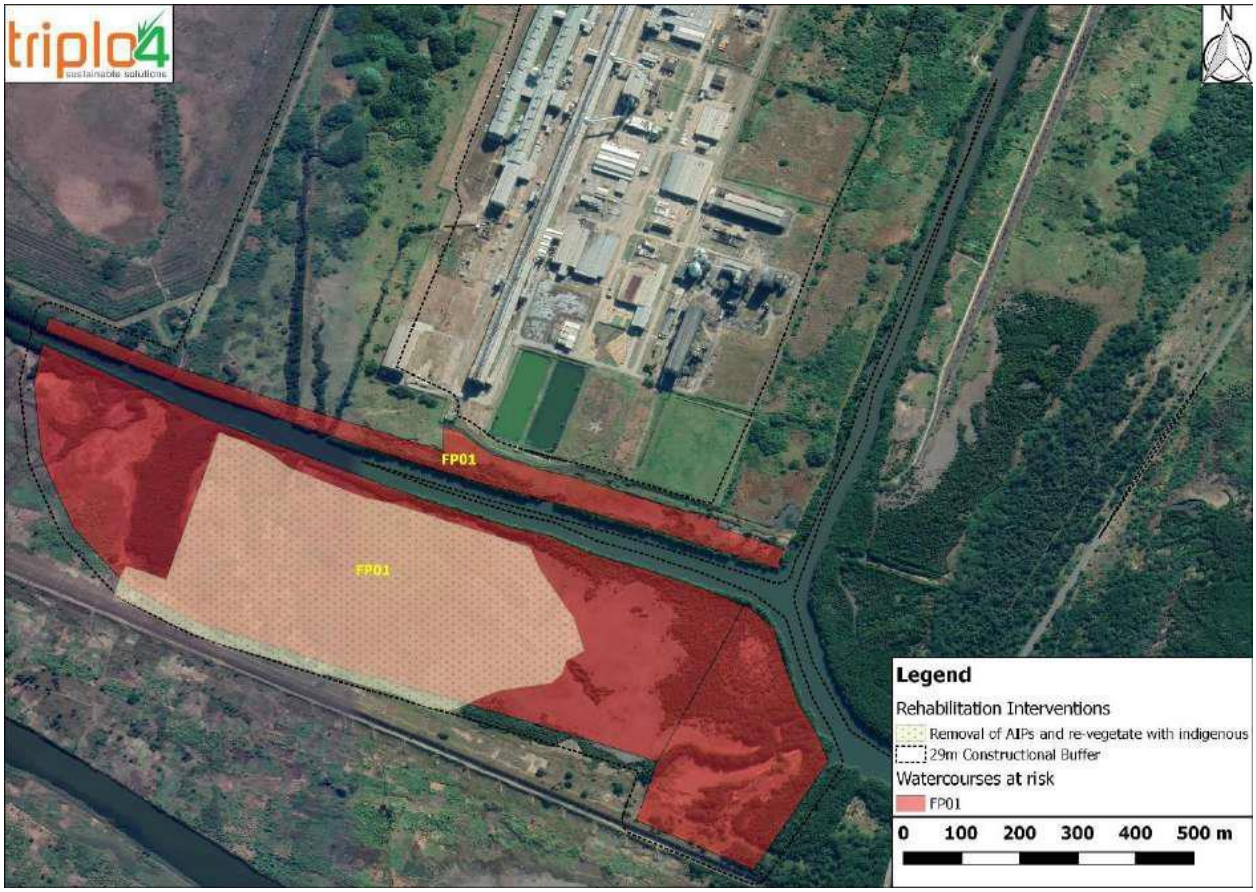

Figure 14. Map of the rehabilitation strategy for FP01

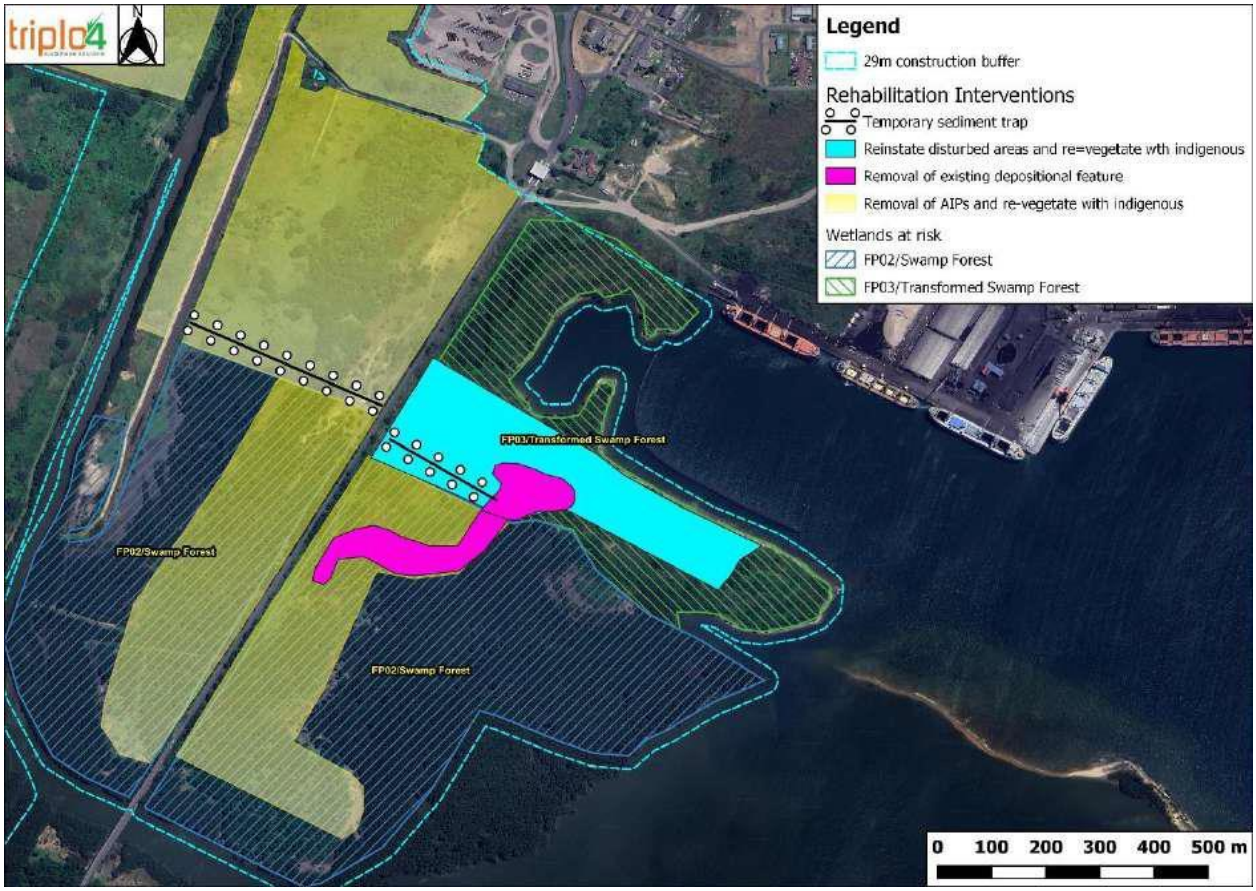

Figure 15. Map of Rehabilitation Strategy for FP02 and FP03

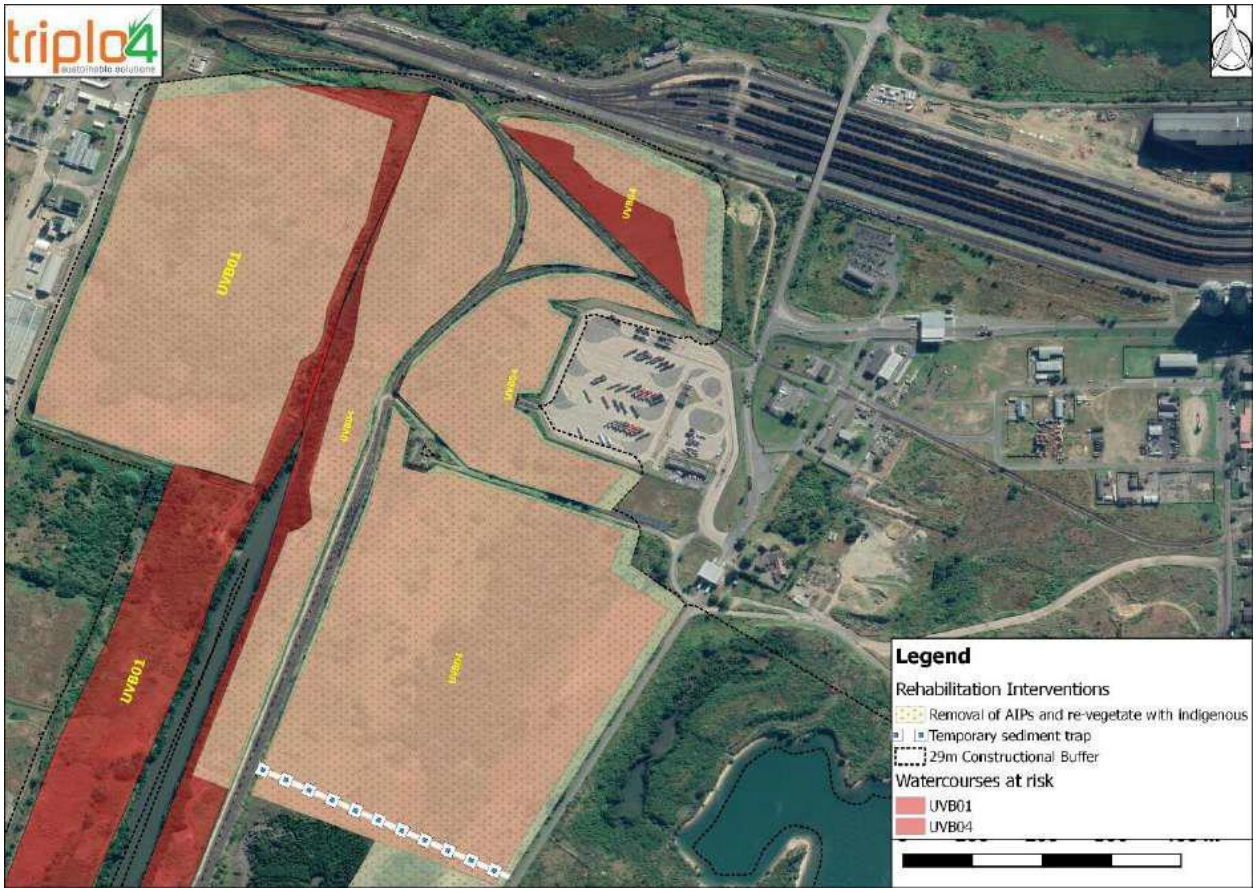

Figure 16. Map of the rehabilitation strategy for UVB01 and UVB04

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: CURRICULUM VITAE OF EAP

CURRICULUM VITAE

Name of Firm:	**Triplo4 Sustainable Solutions (Pty) Ltd**		
Name of Staff:	Aletta Johanna Plomp (Hantie)		
Position in Firm:	Managing Director		
Profession:	Environmental Management		
Date of Birth:	23-01-1966		
Years of Professional Experience:	>20	**Nationality:**	South African

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Professional Registrations and Memberships:
Registered as Professional Natural Scientist with the South African Council for Natural Scientific Professions; Professions in the field "Environmental Science" (2001) Registration number 400026/2001;
Registered as EAP with EAPASA. Registration Number 2019/189;
Registered Accredited Professional – Green Buildings Council South Africa (GBCSA);
Registered member – International Association for Impact Assessment South Africa (IAIAsa);
Registered member – Aquaculture Institute of Southern Africa;
Registered member – Project Management Institute (PMI);
Registered member – Institute of Directors of Southern Africa (IODSA);
Registered company membership – Green Buildings Council South Africa;
Registered company membership – Institute of Waste Management of South Africa (IWMSA);
Registered company membership – Water Institute of South Africa (WISA).

Education:

Key Qualifications:

Mar 2001	Master in Environmental Management (Cum Laude), The University of the Free State (Student No 1999323726)
May 1997	National Diploma in Analytical Chemistry, Technikon Pretoria (Student No 93096851)
Jul 1990	Government Certificate of Competency: Assayers Certificate Part A, Department of Mineral and Energy Affairs
Aug 1989	Modular Training Programme for Analyst, AAC Gold and Uranium Division (Certificate No C.L.009)
Mar 1988	BSC (Microbiology, Physiology), University of Pretoria (Student No 8419329)
Nov 2002	Management Development Programme, Gordon Institute of Business Science – University of Pretoria
Nov 1993	Certificate in Business Management, (Cum Laude), Potchefstroom University for Christian Higher Education Small Business Advisory Bureau
Apr 2013	Registered Accredited Professional – Green Buildings Council South Africa
Sep 2017	Certificate of Competence: Train The Trainer (US 117871) – ETDP SETA
Sep 2017	Certificate of Competence: Conduct Assessments (US 115753) – ETDP SETA

Continued Professional Development: Additional Courses, Workshops, Seminars, Fora, Events:	
Apr 2019	Being a Director Part 5 (IODSA - 1 day Interactive Board Simulation)
Mar 2019	Woman on Boards Programme (Limit Breakers – 3 month programme)
Oct 2018	Sludge to Resource Symposium - 2 days (WISA)
Jun 2018	ISO 19011:2011 Guidelines for Auditing Management Systems, SHEQ National Cert, SA
Feb 2018	Aquaculture Farming 5 Day Course (Certificate of Attendance)
Feb 2018	SETA accredited to conduct environmental training (LG SETA)
Oct 2017	EAP Workshop Programme, DEA Environment House (Workshop)
Oct 2017	Environmental Affairs Business Forum, Durban Chamber of Commerce (Event)
May 2017	SETA Accreditation and Skills Development (Workshop)
Apr 2017	Ugu Maritime Strategy Implementation (Workshop)
Sep 2016	Environmental Affairs Business Forum, Durban Chamber of Commerce (Event)
Sep 2016	Energy Management System (EnMS) 2 Day End User, National Cleaner Production Centre (NCPC) South Africa;
Jun 2016	Hazardous Waste Training Course, Institute of Waste Management of Southern Africa (IWMSA) (Certificate of Attendance No 0106/16)
Apr 2016	Waste Legislation Training Course, IWMSA (Certificate of Attendance No 0304/16)
Mar 2016	SPLUMA, IAIAsa Event
Mar 2016	Sustainable Development Forum (SDF), Institute of Directors in Southern Africa (IODSA)
Sep 2015	Resource Efficient and Cleaner Production Basic Training, National Cleaner Production Centre (NCPC) South Africa (Certificate of Attendance)
Mar 2015	NEMA Environmental Legislation, Shepstone Wylie Attorneys (Certificate of Attendance)
Jun 2015	Being a Director Part 4, IODSA (Certificate of Attendance)
May 2015	Being a Director Part 3, IODSA (Certificate of Attendance)
May 2015	Environmental Law Update, Shepstone Wylie (Certificate of Attendance)
Apr 2015	Governance for SME's, IODSA (Certificate of Attendance)
Oct 2015	Windeed, Windeed Systems, a Division of Korbitec (Certificate of Completion)
Nov 2014	New proposed NEMA regulations 2014, IAIAsa and EDTEA (Workshop)
Nov 2014	Water Use Registrations, IAIAsa & DWS (Workshop)
Oct 2015	KwaDukuza Municipality Low Emissions Strategy for 2030, ICLEI (Stakeholder Contribution)
Aug 2015	KwaDukuza Green Buildings Guidelines Workshop, ICLEA & KDM (Stakeholder Contribution)
Various 2014	KwaDukuza Municipality Low Emissions Strategy for 2030, ICLEI (Workshops)
Various 2013	KwaDukuza Municipality Low Emissions Strategy for 2030, ICLEI (Workshops)
Nov 2012	Coastal Vulnerability Index Workshop, EDTEA (Workshop)
Sep 2010	National Environmental Management – EIA Regulations, DAEA (Workshop)
Sep 2010	National Environmental Management: Waste Act, DAEA (Workshop)
2009-2010	Project Management Course: Internal, RHDHV / SSI Engineers & Environmental Consultants
Sep 2009	Green Buildings & Accreditation, Green Buildings Council SA (Certificate of Attendance)
Nov 2008	DESD Course, Eskom Environmental KZN (Certificate of Completion)
Aug 2008	Quality Management System Training Internal, RHDHV / SSI Engineers & Environmental Consultants
Oct 2007	Project Management, Insite Training Services SETA Accreditation No 0270 (Certificate of Completion)
Apr 2005	Transition Workshop ISO 14001:1996 to ISO 14001:2004, North-West University (Certificate of Attendance)
Feb 2005	Crystal Reports, Business Objects (Certificate of Completion)
Jan 2005	Leadership Development Programme Phase 1 (Emotional Intelligence), AngloGold Ashanti Training and Development Services (Certificate of Completion, No 7152)

Mar 2004	Driver Evaluation K53, Code B, Exclusive Training & Services (Certificate of Competence No 17792)
Oct 2003	Isokinetic Sampling, University of Pretoria (Certificate L15257)
Sep 2003	Practical Landfill Management Principles, Enviro-Fill (Certificate of Attendance)
Aug 2003	Waste Management for Environmental Managers, Potchefstroom Universiteit vir Christelike Hoer Onderwys (Certificate of Attendance)
Mar 2003	Safety Management Audit Training, E.I du Pont Nemours and Company (Certificate of Completion)
Jul 2002	Hazardous Materials, Institute for International Research (Certificate of Participation, No P2333)
Aug 2001	Environmental Law, Potchefstroom Universiteit vir Christelike Hoer Onderwys Centre for Regional Development (Certificate of Completion)
May 2001	Environmental Management Systems, Universiteit vir Christelike Hoer Onderwys Centre for Regional Development (Certificate of Completion)
Apr 2001	Environmental Auditing, Universiteit vir Christelike Hoer Onderwys Centre for Regional Development (Certificate of Completion)
Feb 2000	Biodiversity and Biomonitoring Methodology, University of the Orange Free State Centre for Environmental Management (Certificate of Attendance)
Feb 2000	Integrated Environmental Management for Local Authorities, University of the Orange Free State Centre for Environmental Management (Certificate of Attendance)
Jan 2000	Environmental Impact Assessment, University of the Orange Free State Centre for Environmental Management (Certificate of Attendance)
Nov 1998	National Water Act, 1998 – Implications for the Mining Industry, South African Institute of Mining and Metallurgy and the Water Institute of Southern Africa Joint Colloquium
Mar 1998	Introduction to Computers, Windows 95, Procomp Computer Training (Certificate of Completion)
Feb 1998	Management Development Phase 1, Vaal Reefs Exploration and Mining Co Ltd Human Resource Development (Certificate of Attendance)
Jan 1998	Business Presentation Skills, Business Presentations Skills Pty Ltd (Certificate of Completion)
Sep 1997	Accident and Incident Investigations (Chamber of Mines South Africa Mine Safety Division (Certificate of Attendance)
Sep 1996	Risk Assessment for Mining Engineering Practice, AngloGold Technical Training and Development Services (Certificate of Completion No FG/96/02)
Jan 1995	Communication Skills Course (Oral & Written), Vaal Reefs Exploration and Mining Co Ltd Regional Training Centre (Certificate of Attendance)
Apr 1993	Communication Skills Course (Written), Vaal Reefs Exploration and Mining Co Ltd Regional Training Centre (Certificate of Attendance)
Aug 1990	Advanced Supervision Vaal Reefs Exploration and Mining Co Ltd Regional Training Centre (Certificate of Attendance)
Feb 1990	Safety Representative Vaal Reefs Exploration and Mining Co Ltd Metallurgical Plants (Certificate of Competence No SR 157)
Jan 1990	Supervision Vaal Reefs Exploration and Mining Co Ltd Regional Training Centre (Certificate of Attendance)
Feb 1989	Certificate in Mine Safety and Loss Control, Vaal Reefs Exploration and Mining Co Ltd Metallurgical& Engineering Plants (Certificate of Competence No M-324)

Employment History:

October 2011 to date Triplo4 Sustainable Solutions Pty Limited
Managing Director
Responsible for the establishment and sustainable growth of the company and

ensuring the provision of consulting services and sustainability products as per the company profile. Ensure Corporate Governance and development and implementation of the company strategy.

August 2010 to September 2011	Enspire Environmental CC Founding Member Responsible for the execution of existing projects and the winding down of the close corporation and transition to Triplo 4 Sustainable Solutions Pty (Ltd).
November 2006 to July 2010	SSI Engineers and Environmental Consultants (Environmental Sector) Sector Area Manager – KZN Environmental / Principal Associate Responsible for the overall management and development of the regional environmental sector, including the identification, development and implementation of the regional strategy, innovation and corporate social responsibility management system. Business development, marketing and quality delivery were key aspects to address in ensuring a sustainable sector. Responsibilities also included the provision of environmental consulting services, technical assistance for environmental projects and ensuring compliance with occupational health and safety issues related to the Ballito satellite office.
Mar 2004 to Oct 2006	AngloGold Ashanti Environmental Manager Systems Environmental Manager responsible for managing the development and implementation of fifteen ISO 14001:2004 certificated Environmental Management Systems, conducting audits and ensuring the conducting of legal compliance and system audits, ensured the development and implementation of environmental training as well the conducting of impact and risk assessments and development of environmental management plans for AngloGold Ashanti (mining, chemical processing and engineering related). Responsibilities included the development and presentation of a range of environmental and EMS training courses and managing the investigation, reporting and review of major environmental incidents.
Jan 2003 to Mar 2004	Environmental Coordinator: Air and Waste Management Responsible for the development of a waste management and air quality management systems for the company. Initiated the strategies and driving of the implementation of the waste management strategy at corporate and business unit levels, ensuring the identification of the baseline assessment and identification of waste streams, development of guidelines and operational procedures as well as establishing appropriate waste contractors for recycling and disposal. Specific action plans were developed to ensure compliance with legislation, which were later incorporated into the certificated ISO 14001 system.
Apr 2001 to Dec 2002	Environmental Auditor Developed and implemented an audit protocol and programme and conducted compliance audits to ensure company compliance with environmental legal requirements. Assisted with the development of corrective and preventative action plans to address noncompliance and built environmental capacity through the implemented audit process. Developed an incident identification, classification and reporting programme, which required the detailing of environmental impacts, basic causes, immediate actions as well as long term corrective and preventative actions.
Mar 1996 to Apr 2001	Environmental Management, Training and Awareness & Water Co-coordinator The main function entailed the development of part 9 EMPR amendments for all South Africa Region mining Business Units (25). Coordinated the development and implementation of environmental training courses and awareness programmes.

	Regarding water management; developed a blueprint for water monitoring, analyzed and interpreted data relating to water monitoring and recommended remedial actions to be taken and assisted with the development of water balances and water related risk assessments.
Mar 1988 to Mar 1996	Chemical Analyst Grade 2 and Grade 1, Analytical Chemist and acting Assistant Chief Chemist As Chemical Analyst, responsibilities included the chemical analysis of solid and liquid mining samples. Responsibilities as Chemist included the supervising and co-coordinating uranium and gold laboratory staff and processes to meet planned schedules, co-coordinating the quality assurance programme, ensuring compliance with safety regulations and code of practices and procuring instrumentation and ensuring financial management.

Employment Experience:

ISO 14001:2004 & 2015 Environmental Management Systems (EMS) & ISO 9001:2015

Facilitated the stakeholder and public participation process and compiled a draft environmental policy for KwaDukuza Municipality. Compiled Environmental Management Policy and aligned company processes and systems with ISO 14001 required for supplier purposes for a refrigeration company, KZN.

Successfully assisted approximately 7 different AngloGold Ashanti (South Africa and Ghana based) mining sectors (mines, metallurgy, engineering, rehabilitation, properties (high and low density), procurement and human resources, with the design, development and implementation of a certified EMS, in accordance with the ISO 14001:2004 standard.

These EMS's included original policy development, gap analysis, EMS planning, implementation and review, including environmental training, assessment, non-conformance and environmental incident management, system and operational procedure development and auditing of the EMS systems.

In early 2018 ensured the successful development and implementation of the Triplo4 Sustainable Solutions ISO 9001:2015 and ISO 14001:2015 and external certification by SHEQ National Cert during May 2018.

Environmental Assessments

Completed or assisted consultants to complete various EIA's, environmental risk assessments and smaller environmental recommendations (list only as examples and therefore not comprehensive):

- BA's and EIA's for residential and housing developments;
- Environmental authorization for biodiesel processing facility and Moringa plantation;
- BA's for shopping Centres;
- Basic Assessments for roads and storm water management;
- Basic Assessment for pipelines and bridges with watercourse crossings;
- Basic Assessments for masts and antennas;
- Basic Assessments for construction activities within 100 metres of the high water mark;
- Basic Assessments and EIAs for Property Developments;
- Basic Assessment for the storage of dangerous goods;
- Basic Assessments for filling stations;
- EIA and Basic Assessments for Waste Licenses;
- EIA for a ventilation shaft (land rezoning);
- EIA for the development of a new water treatment facility;

- EIA for AngloGold Ashanti - Various smaller EIA's (2004 – 2006);
- New mining area extensions;
- Mining deepening project; ·
- Drainage trench pollution management project;
- New mill project;
- Removal of topsoil prior to waste rock dump extension;
- Calcine and pyrite storage areas;
- Underground garage tanks removal;
- Hydrocarbon discharge and containment requirements;
- SPCA relocation; and·
- Amendment and exemption applications for property development, storm water management, activities within 100 metres of the high water mark and public participation.

Environmental Audits

Conducted in excess of 50 legal compliance audits as environmental auditor for AngloGold Ashanti. These audits included all facilities associated with the mining authorizations, for example:

- mines / shafts;
- waste disposal sites;
- waste transfer stations / salvage yards;
- sewage treatment works;
- compliance to water use and discharge conditions;
- game parks;
- engineering workshops;
- third party audits e.g. rock drill and exploration drilling contractors; and high density, residential accommodation.

Conducted as lead auditor, gap analysis and internal environmental audits for ISO 14001:2004 certification.
Conducted external audits on environmental legal compliance, inclusive of relevant authorizations, licenses, permits and EMPs for:

- Dube Tradeport Corporation;
- Hazardous waste management facilities;
- Beema Bamboo plantation (approx. 500ha) for green energy generation;
- Construction and upgrades of roads and bridges;
- Shopping centers;
- Desalination plant;
- Pipeline constructions;
- Mines / shafts;
- Waste disposal sites;
- Mines / shafts;
- Waste transfer stations / salvage yards;
- Sewage treatment works;
- Compliance to water use and discharge conditions
- Cemeteries;
- Game parks; and
- Engineering workshops.

Environmental Disasters, Non-conformance and Incidents

Completed Section 30 and Section 28 emergency incident applications and business plans for KwaDukuza private sectors and Ugu District Municipality following the 2007 coastal storm event. Served on the KwaDukuza and Ugu Municipality Disaster Steering Committees and worked with the coastal management department of DAEA KZN, regarding coastal damage and remediation. Identifying remediation requirements in accordance with coastal principles and conducted environmental monitoring (Environmental Control Officer) for remediation work.

Conducted various workshops to assist business units to identify environmental incidents. Developed procedures for the identification, classification and reporting of environmental incidents. Developed inspection checklists and training material to build capacity for environmental incident management. Assisted business units with the identification and implementation of practical options to address and prevent future environmental incidents. Monitored the implementation and sustainability of the remediation plans and programmes and monthly reported statistics.

Compiled various major environmental review documentation, including:

- Hydrocarbon contamination;
- Pipeline failures and contamination;
- Contractor and contract management;
- Air pollution from tailing storage facilities; and
- Emergency preparedness and response.

Compiled Section 24G applications and environmental assessment and successfully obtained environmental authorizations for unauthorized activities in terms of the National Environmental Management – EIA Regulations.

Supervised S24G applications with GDACE and KZN DAEA/ EDTEA within various areas included:

- Activities within 100 meters of the high water mark (Ilembe, Ugu);
- Cemetery (Ugu);
- Crematorium (iLembe);
- Housing development (KwaDukuza)
- Foundry (Sedibeng).

New Mining Authorizations, EMPr Amendments, EIA Amendments and EMPr Assessments

Experience includes the management of and compilation of new mining authorizations and permits, EMPr Amendments and EMPr Assessments. The following is a short summary of work managed and compiled:

- Coal mining EMPr and pre-commencement requirements (Mpumalanga);
- Coal mining permits and EIA (KZN);
- Sand mining permits (KZN);
- EIA Assessments for activities within 100 meters of the high water mark (Ilembe, Ugu);
- EIA Assessment for Cemetery (Ugu);
- EIA Amendments for developments (various within KZN);
- EMP amendment for a Uranium Plant expansion project;
- EMPr's for property developments (low income, affordable housing, high density, upmarket residential);
- Environmental Performance Assessments for mining (33);
- New mining authorizations (2);
- Development and assessments of exploration EMP's;
- Tailings storage facility expansion;

- Waste Rock Dump mining and utilization;
- Pollution control dam (with safety risk) establishment;
- New ROM mill construction;
- Regional EMP updates in accordance with MPRDA;

As Environmental Manager – System, assistance was provided to the Legal Department with the environmental conditions for the conversion of the old order mining rights.

Environmental Feasibility Studies and Environmental Enquiries

Responsible for the compilation of feasibility studies and environmental enquiries for:

- Property developments;
- Linear developments;
- Commercial and industrial developments;
- Airport expansion; and
- Waste water treatment works.

Where possible, innovative solutions are investigated with Clients and the Authorities to reduce or eliminate environmental impacts within the legal frameworks, thereby reducing costs, timeframes and potential penalties associated with environmental processes and transgressions.

Environmental Control Officer Functions

Conducted numerous site inspections and produced environmental audit reports to Clients and the Authorities. Directed, guided and reviewed the work of subordinates:

- Linear developments e.g. roads and pipelines;
- Commercial developments e.g. Shopping Centers within urban and rural areas;
- Property developments, inclusive of sensitive areas; and
- Industrial developments e.g. desalination plant.

Waste and Water Management, including Water Use Licenses

Practical experience and competence in waste management was established through the development of waste management programmes and procedures for the responsible management (re-use, recycle and disposal) of waste, following the identification of general and hazardous waste types and waste streams for the various mining sectors. Procedures developed, included:

- General waste (paper, plastic, wood);
- Domestic waste;
- Hazardous waste (fluorescent tubes, hydrocarbons, batteries, medical); and
- Water management.

Conducted legal compliance audits for waste disposal sites - Gauteng and North West in accordance with the DWAF permits as well as the external (3rd party) audit of the Holfontein hazardous waste disposal site. Coordinated the review of the existing landfill and airspace requirements and investigations for extensions or new sites and provided recommendations to improve operational performance from an environmental perspective. As part of the corporate responsibility programme, assisted the Municipality and DAE&RD with waste recycling and waste awareness programmes.

Involvement with the establishment of a regional water balances, incident investigations and the review of Business Unit water resource and water quality management issues as well as developed competence on surface water management issues.

Applications for waste licenses in terms of the National Environmental Management Waste Act included:

- E-waste facility;

- Waste disposal facility (land building);
- Waste Water Treatment Works.

Conducted and managed applications for water use registrations for industry, private and public sectors that include:

- Water abstraction from a resource;
- Water storage;
- Wetland (c) and (i); and
- Discharge of water to a resource.

Training Courses and Awareness Programmes

Throughout my environmental career, I have been involved with the development of training and awareness programmes and material as well as the presenting of training to all levels within organizations and the public sector. The following is a list of courses prepared and delivered and awareness created:

- Environmental awareness programme to improve inadequate EMS performance;
- Train the trainer courses – waste management and general environmental awareness;
- Environmental Management Courses for Managers and Councilors – Local Municipality;
- 1-day General Environmental Management Course for Managers;
- Environmental incident recognition and reporting;
- Top management training course;
- General awareness course for C-level as well as Group 3 - 8 employees;
- Water management awareness course;
- General introduction to waste management and mining authorization requirements;
- EMS system procedures course;
- Water week awareness day with schools;
- Environment day projects with local pre-primary and primary schools;
- Greening project with local community (presentations and site visits);
- Arbour day programme with high schools; and
- Grassing and recycling project with local community.

In 2017, I completed the Train-The-Trainer and Assessor Courses and lead the company to obtain LG SETA accreditation.

International Experience:

Ghana

Languages:

	Speak	**Read**	**Write**
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

Environmental Experience: Selected Projects undertaken at Triplo4, Enspire Environmental & SSI:

During my employment as Environmental Consultant as well as being a member of Enspire Environmental and Director and shareholder of Triplo4 Sustainable Solutions, Pty (Ltd), I have been and continue to be involved in environmental projects at various levels. Responsibilities included and continues to include:

- Conducting of site visits with the Clients and Authorities;
- Identifying environmental issues, legislative requirements and feasible alternatives;

- Compiling relevant documentation or advising on the requirements;
- Liaising with the Client, Authorities and conducting Public Participation Processes;
- Conducting ECO work and conducting external audits with the Authorities;
- Addressing Authority requirements;
- Problem-solving, innovation and advising on preventative and corrective measures;
- Reviewing documentation;
- Developing consultant's competence though coaching and mentoring;
- Ensuring quality management;
- Developing own competence though training;
- Taking full responsibility for own work;
- Being accountable for the unit (SSI) and companies' (Enspire and Triplo4) performance.

The following is a reference sample of specific projects:

Environmental Impact Assessments/ Basic Assessment Reports/ Environmental Management Programmes/ 24G Applications/ Amendments Applications / Closure Plans/ Enquiries

2021	Elaleni Lifestyle Estate Basic Assessment	Blue Gum Estate (Pty) Ltd
	Ballito Village & Ballito Views Part 2 Amendment	
	AMahlongwa Estuarine Management Plan	Department of Economic Development, Tourism and Environmental Affairs
	Gas to Power Powership Project at the Port of Saldanha Bay, EIA, Specialist Studies, EMPr	Karpowership SA (Pty) Ltd
	Gas to Power Powership Project at the Port of Richards Bay, EIA, Specialist Studies, EMPr, WULA	Karpowership SA (Pty) Ltd
	Gas to Power Powership Project at the Port of Nqgura, EIA, Specialist Studies, EMPr, General Authorization	Karpowership SA (Pty) Ltd
2020	Elaleni Lifestyle Estate Part 2 Amendment	Blue Gum Estate (Pty) Ltd
	The Strategic Corridor Development Plan for Vryheid to Ermelo	SMEC for COGTA
	Elaleni Coastal Forest Estate Leisure Centre Basic Assessment	Northglobal Properties
	Ballito Village Part 2 Amendment	ARCIS Pty Ltd
2019	South Coast Environmental Assessment	Black Balance Projects
	Seaward Estate Emergency Application	Seaward Estate
	Rocky Ridge Township Part 1 Amendment	Rocky Ridge Farming and Investments (Pty) Ltd
	Greater Inanda Local Area Plan (environmental input)	Zimanga Urban and Rural Design for eThekwini Human Settlement Department
	Development Framework and Master Plan Update for the La Mercy Joint Venture	Dube TradePort and ACSA JV
	Mandeni Filling Station, South Africa	Amazulu Foundation
	Oriole Precinct	Abland Propriety Limited
	Thompsons Bay Beach MMP	KwaDukuza Local Municipality
	Vlakspruit Crematorium Air Emissions License and Environmental Impact Assessment	KwaDukuza Local Municipality
	Thompsons Bay Beach Stormwater Infrastructure Maintenance Management Plan and S30 Application	KwaDukuza Local Municipality
	Nonoti Housing, WWTW and associated infrastructure EIA	SMA Consultants
	Elaleni External Audit and Legal Compliance	North Global Development
	Vuthela Waste Scoping & Assessment - Research	Vuthela
	eThafeni Cemetery – Water Management Assessment	KwaDukuza Municipality

	The Vines & Lush – Elaleni Amendments	Elaleni Estate
	The Executive Amendments	Golden Dividend 341
2018	Sappi Tugela Mill Effluent Pipeline - Maintenance Management Plan	Sappi Tugela Mill
	La Mercy South Beach Road Fatal Flaw Analysis Assessment	Met Developments (PTY) LTD
	Waste Tyre Pyrolosis Plant, Gauteng - Environmental Opinion and EMPr	Cosmic Energy Africa
	Oasis Sibaya Residential Development - Environmental Enquiry and EMPr	Edison Property Group
	Vulindlela Strategic Environmental Assessment	SMEC for Msunduzi Municipality
	Waste Tyre Pyrolysis Plant, Newcastle, Environmental Opinion	Encogenix
	Malachite Business Park - Environmental Enquiry, Part 1 amendment	Abland Propriety Limited
	Hydrocarbon Ground Contamination at a residence in Umlazi, Q Section	Ms. Nelisile Nzama
	Inoxa Cookware Factory: Environmental Management Programme	Shree Property Holdings
	Avondale Basic Assessment	Horsewood Trust
	Environmental Enquiries – Cellphone Masts	Huawei MTN
	Beachwood Coastal Estate – Basic Assessment	Beachwood Investments
	Elaleni – Lush Environmental Enquiry	Firewings Properties
	Shaya Quarry Mining Permit	Mataroway (Pty) Ltd
	Empangeni Coal Mining Permit	Mbavuza Mining
	KDM Sport Complex Basic Assessment	KwaDukuza Municipality
2017	KwaDukuza Coastal Maintenance Management Plan	KwaDukuza Municipality
	Southern Regional Bulk Water & Sanitation Scheme BA	Escongweni Engineers for iLembe District Municipality
	Yzermyn Underground Coal Mine, Mpumalanga	Atha Africa Ventures
	Remainder of Portion 1 of Erf 2838 is located within the	Golden Dividend 344 (Pty) Ltd
	“Executive Office Estate" Release from DMOSS and Part 1 Amendment	
	Groutville D Sanitation Programme Due Diligence, Planning and EMPr	DKG Project Managers and Engineers
	Lower Thukela Regional Bulk Water Supply Scheme, KZN, Basic Assessments and Amendments	Various Engineers e.g. Naidu Consulting for iLembe District Municipality
	Phase 1A and 1B of the Proposed Southern Regional Bulk Water and Sanitation Scheme - Basic Assessment and Environmental Enquiry	Escongweni Engineers (on behalf of iLembe)
	Cornubia North Phase 1 Mixed Use Development EIA	Tongaat Hulett Developments
	Yzermyn Underground Coal Mine, Mpumalanga EMPr	Atha Africa Ventures
	Springvale Country Estate Residential Development Section 24G and Part 2 Amendment	DG Investment / Springvale Country Estate
	KwaDukuza Crematorium S24G	KwaDukuza Municipality
	Zinkwazi Beach Sewer System Upgrade BA	Nyeleti Consulting for KwaDukuza Municipality
	Desalination Plants Pre-feasibility studies and business plan for 4 Districts (Ugu, iLembe, King Cetshwayo & uMkhanyakude)	FocusPM / Umhlatuze Water for CoGTA
	Homestead Residential Development Comprising of 288 Units, Umhlali	Spinosa Developments (Pty) Ltd

2016	Elaleni Coastal Forest Estate Residential Development EIA Pre-Commencement Environmental Services, EMPr and Part 2 Amendment	Cross Atlantic Properties 65
	Lower Thukela Regional Bulk Water Supply Scheme, KZN, Basic Assessments and Amendments	Black Balance Projects and Various Contractors for iLembe District Municipality
	BP Sunpark Motors Phase II Assessment	Sunpark Motors CC
	Dibiliza Junction – Petrol Filling Station (PFS) Relocation Enquiry and Closure Plan	Silverton 96 CC
	Felix Dlamini Road PFS BA	Dawngrove Investments CC
	Ngwelezane PFS Assessment, Enquiry and EMPr	Unlock Land Potential Pty Ltd
	Ethafeni Precinct Housing Development S24G and EIA	SMA Consultants for KwaDukuza Municipality
	Erf 196 Residential Development Tinley Manor BA	Elysium Trust
	Foxhill Smallholdings Development Assessment and Enquiry	Weaver
	Avondale Residential Development (Erf 1433, 1432, 1447) Enquiry and BA's	The Horsewood Trust
	Gasifier Project Environmental Assessment	Green Grid Energy
2015	Oceans Umhlanga Hotel & Residential Development	Edison Property Group
	Lower Thukela Regional Bulk Water Supply Scheme, KZN, Basic Assessments and Amendments	Black Balance Projects for iLembe DM
	Nonoti Housing Development EIR, EMPr and Specialist Studies	SMA Consultants for KwaDukuza Municipality
	Bhamshela PFS BA	Timocento (Pty) Ltd
	Zulti South Access Roads	RHDHV for Richards Bay Minerals
2014	Mhlabatshane Bulk Water Supply Scheme Phase 2 BA	Umgeni Water
	KwaDukuza Mall and Urban Precinct Development BA	Edison Property Group
	Lower Thukela Regional Bulk Water Supply Scheme BA's	Black Balance Projects for iLembe DM
	Mpophomeni Shopping Centre BA	Dymatron Pty Ltd
	Stanger Fuel Depot EDTEA Response, Enquiry and EMPr	Desai Family Trust
	Tugela Ferry PFS BA	Copperzone 163 Pty Ltd
	Eshowe Industrial Township BA	uMlalazi Local Municipality
	Bhamshela WWTW BA	Timcento Pty Ltd
2013	The Stables Retirement Village	Kabod Development Group
	Ugu Water and Sanitation – Generic EMPr for WWTW and Bulk Infrastructure	Ugu District Municipality
	Joymac Sands Mining Permit	Joymac Sands Sales
	Nyathikazi Road upgrade	SMA Consultants for KwaDukuza Municipality
	Cornubia North 760 hectare Mixed Use Phased Development - Full Scoping and Environmental Impact Assessment	Tongaat Hulett Developments
	Simbithi Eco Estate – Jacana Development	Silvermoon Properties
	P232 Road Upgrade and Stream Crossing BA	RHDHV for Department of Transport
	D887 Road Upgrade	RHDHV for Department of Transport
	Mbozamo Road Upgrade and Stream Crossing BA	SMA Consultants for KwaDukuza Municipality
	Greytown Bulk Water Supply Scheme Phase 2 – 35km	RHDHV for uMzinyathi DM

	Jozini Regional Community Water Supply Scheme – 62km BA & EMPr	RHDHV for Umkhanyakude DM
	77 Colwyn Drive BA	Marlboro Pty Ltd
2012	Steve Biko Phase 2 Housing Development	SMA Consultants for KwaDukuza Municipality
	Tugela Ferry Shopping Centre, WWTW	Copperzone 163 (Pty) Ltd
	Gqolweni Road BA	Umdoni Municipality
	Simba Mabhele Farm Enquiry and EMPr	Mrs Mbalo
2011	Steve Biko Phase 2 Housing Development	SMA Consultants for KwaDukuza Municipality
	Tugela Ferry Shopping Centre, WWTW	Copperzone 163 (Pty) Ltd
	Biodiesel BA (Moringa Oil)	Enterprise Ilembe
2010	Foundry Environmental Assessment & Authorisation	Yellow Star
	Umzinto Low Level Bridge BA	Liquid Platinum
	88 Compensation Amendment	Imali Corp / @ 88
	South Beach Road Amendment	Ivan Architects
	Umdoni Crematorium S24G and EMPr	Umdoni Municipality
2009	Environmental input into planning for the R102 & Local Area Plans for Northern Urban Development Corridor	eThekwini Municipality – Framework Planning
	Lower Sizananjalo Pedestrian Bridge in Underberg	Emzansi Engineers
	Emalangeni Rural Housing Development	eThekwini Municipality – Housing
	Umdoni Flood Damage Repair BA's and EMP	Umdoni Municipality
	eThekwini Promenade Upgrade	Aecom
	Compensation Industrial and Business Estate – 320 hectare EIA	Tongaat Hulett Developments
	Prospecton Anaerobic Digester Gas Conversion to Electricity BA	South African Breweries (Pty) Ltd
2008	Cornubia Mixed Use Phased Development – 1300 hectare EIA	Tongaat Hulett Developments
	Mkhuze Airport Feasibility Study	Umhlosinga Development Agency & DBSA
	Ekhrosini Livestock Market and Urban Node Development	Isibuko Se-Africa for Msunduzi Municipality
2007	National Radar Network Upgrading	South African Weather Service
	Signal Hill Housing Development – 200 hectare	Msunduzi Municipality – Housing
	Ximba Low Income Rural Housing Development	Msunduzi Municipality – Housing

Environmental Enquires / Environmental Opinion

2020	Elaleni Leisure Centre	Northglobal Properties
	Digrite, Sheffield Beach	Northglobal Properties
	Malachite Phase 2	Lapalaka Property Projects
	Elaleni Beach Club	Northglobal Properties
2019	Jex Estate	Collins Group
	Lazuli Phase 2	Lazuli Coastal Lifestyle Estate (Pty) Ltd
2018	Mandini Petrol Filling Station	Amazulu Foundation
	Romac Farm	Trace Property Investments (Pty) Ltd
2017	Extension to the Executive	Golden Dividend 344 (Pty) Ltd
	Foxhill Forest Estate, Salt Rock	LevEco Architects

	Sage Restaurant Expansion	Clinton Erlank
2016	Avondale Residential Development	Saxony Developments
	Foxhill Smallholdings Development	Mr. Weaver
	Erf 599 Stanger Warehouse Development	Chetty's Properties Trust
	27 Magai Drive	Martin Lind
	Dibiliza Petrol Filling Station	Silvertron 96 cc
	1 Barrier Lane	Mr. Murray
2015	50b Colwyn Drive	Graham Trading & Investments Pty Ltd
2014	Stanger Fuel Depot	Ismail Desai Family Trust
2013	Loxley Estate	Cenprop Pty Ltd

Water Use Authorisations and External Auditing

2019	Sheffield WWTW	Siza Water
	Eston Sugar Mill	Illovo Sugar (South Africa) (Pty) Limited
	Noodsberg Sugar Mill	Illovo Sugar (South Africa) (Pty) Limited
	Ixopo Clover	Dairy Farms of South Africa (Pty) Ltd.
2018	Integrated Water Use Licence Application for the UCL Company properties ; Uitmuntend Farm, Paardefontein Farm, Norton Heath Farm, Vogelvlei Farm	UCL Company (Pty) Ltd
	Izinga Residential Development Phase 2 (Izinga III): WULA	Tongaat Hulett Developments
	Mpumalanga Town Centre Housing - WULA	Pangea Consulting
2017	Elaleni Coastal Forest Estate	Cross Atlantic Properties
	Nonoti Housing Development	SMA Consultants
	Avondale Residential Development	Saxony Developments
	Clover Ixopo	Clover SA
	Groutville Bulk Sanitation Scheme (Ph 2)	Black Balance Projects for iLembe DM
	Eston Sugar Mill	Illovo Sugar (South Africa) Pty Ltd
2016	Avon Peaking Power Plant	Avon Peaking Power Plant (Pty) Ltd
	Bhamshela WWTW	Timocento (Pty) Ltd
	Avondale Residential Development	Saxony Developments
	Kwadukuza Crematorium	Kwadukuza Municipality
	Palm Lakes WWTW	Royal Palm Property Holdings
	Seaglen Dunes WWTW	Glenmore Seaside Resort Pty.
2015	Lower Thukela Bulk Water Supply Scheme	Black Balance Projects for iLembe DM
	Ixopo Clover Depot	Clover SA (Pty) Ltd
	Tugela Ferry Shopping Centre	Copperzone 163 (Pty) Ltd
	Groutville Bulk Sanitation Scheme (Ph 1)	Black Balance Projects for iLembe DM
	Birdhaven Residential Estate Development	Graham Trading & Investments
	Steve Biko Phase 2 Housing Development	SMA Consultants for KwaDukuza Municipality
	Mpophomeni Shopping Centre	Dymatron Pty Ltd
	Humberdale Landfill Site Phase 2 Expansion	Umdoni Municipality
	Jozini Regional Water Scheme	RHDHV
	Tugela Ferry Shopping Centre	Copperzone 163 (Pty) Ltd
	Gledhow Sewage Pipeline	Black Balance Projects for iLembe DM
	KwaDukuza Mall and Urban Precinct Development	Edison Property Group
	Greytown Bulk Water Supply Scheme Phase 2 – 35km	RHDHV for uMzinyathi DM

2014	Dunkirk Estate Club House	The Dunkirk Estate
	Lower Thukela Bulk Water Supply Scheme	Black Balance Projects for iLembe DM
	Zulti South Access Roads	RHDHV for Richards Bay minerals

Environmental Control Officer (ECO) and External Auditing

2020	Elaleni Lifestyle Estate	Blue Gum Estate (Pty) Ltd
	Clairwood Logistics Park	Capital Propfund (Pty) Ltd
	Phase 1b Southern Regional Bulk Water & Sanitation Scheme	Escongweni Engineers for iLembe District Municipality
	The Executive Estate Monitoring	Golden Dividend 341 (Pty) Ltd
2019	Mpophomeni Shopping Centre	Dymatron Pty Ltd
	External Audit Umbogintwini Industrial Complex (Site 17 and 19)	AECI Limited
	Elaleni: Lush	Fire Wings (Pty) Ltd
	Elaleni: Morris Village	Four Arrows Investments II (Pty) Ltd
	Elaleni: Vines	Cross Atlantic Properties 65 (Pty) Ltd
2018	Willard's Beach	Nyeleti Consulting (Pty) Ltd.
	Thompson's Bay Beach	Nyeleti Consulting (Pty) Ltd.
	Compliance Audit in terms of the Water Use Licence for the Impenjati Farm	Doveton Farms
	KwaDukuza Mall - compliance audit License conditions	Edison Property Group
	The Executive – Compliance Monitoring & Reporting	The Executive
2017	Yzermyn Underground Coal Mine, Mpumalanga	Atha Africa Ventures
	Lower Thukela Regional Bulk Water Supply Scheme, KZN, Basic Assessments and Amendments	Black Balance Projects and Various Contractors for iLembe District Municipality
	KwaDukuza Mall and Urban Precinct Development	Edison Property Group
	Elaleni Coastal Forest Estate	North Global Properties
	Warehouse facilities in Woodmead Estate	Shree Property Holdings
	Avon Power Peaking Plant Monthly Water Monitoring and Reporting	Avon Power Peaking Plant
	Humberdale Landfill Site - Annual External Audit in terms of the WML	Mashalaba & Associates Consultants
2016	Jozini Regional Community Water Supply Scheme	Royal HaskoningDHV
	Oceans Umhlanga Hotel & Residential Development	Edison Property Group
	Water Monitoring for Ground and Surface Water for the Avon Peaking Power Plant	Avon Peaking Power Plant
	Lower Thukela Regional Bulk Water Supply Scheme	Black Balance Projects and Various Contractors for iLembe District Municipality
	Beema Bamboo to Energy Project External Audit	Green Grid Energy
2015	Msikaba Water Supply Scheme Phase 1	RHDHV for Ugu DM
	Greytown Bulk Water Supply Scheme Phase 2	RHDHV for uMzinyathi DM
	Warehousing Facility at Dube Trade Port	Shree Property Holdings
	Lower Thukela Regional Bulk Water Supply Scheme	Black Balance Projects for iLembe DM

2014	Tugela Ferry Shopping Centre, WWTW and PFS	Copperzone 163 (Pty) Ltd
	DTP Agrizone & Site Wide External Operational Audit	Dube TradePort Corporation
	Kranskop Bulk Water Supply Scheme	RHDHV for uMzinyathi DM
	Upgrade of Stream Crossing Structure on Mbozamo	SMA Consultants for KwaDukuza Municipality
	DTP Agrizone & Site wide external operational Audits	Dube TradePort Corporation
2013	Beema Bamboo Plantation Site (Bamboo to Energy project) ECO	Green Grid Energy
	88 Compensation Residential Beach Development - Ballito	Imali Corp / @ 88
	Gqolweni Road ECO	Umdoni Municipality
	Foxhill Church and Residential Development	M&C Janigh Trust
2012	Zinkwazi Desalination Plant	Umgeni Water
	Komati Water Pipeline ECO	Stefanutti Stocks / Cycad Pipelines
	Joymac Sand Mining ECO	Joymac Sand Sales
	Clover ECO	Clover, Ixopo
2011	Beema Bamboo Plantation Site (Bamboo to Energy project)	Green Grid Energy
	88 Compensation Residential Beach Development - Ballito	Imali Corp / @ 88
	Foxhill Church and Residential Development ECO	M&C Janigh Trust
	Umzinto Low Level Bridge BECO	Liquid Platinum
2010	AngloGold Ashanti External Legal & ISO 14001 Audits (Various Mines and Services)	AngloGold Ashanti
	Zinkwazi Desalination Plant ECO	Umgeni Water
2009	Blackburn Bridge ECO	SANRAL
	Zinkwazi Desalination Plant ECO	Umgeni Water
	Umdoni Flood Damage Repair Projects ECO	Umdoni Municipality

Water Quality Monitoring

2018	Monthly Surface and Ground Water Monitoring for the Avon Power Peaking Plant	Avon Power Peaking Plant (Pty) Ltd
	KwaDukuza Mall - Groundwater and surface water monitoring	Edison Property Group
2017	Lower Thukela Regional Bulk Water Supply Scheme	Various Contractors for iLembe District Municipality
	KwaDukuza Mall and Urban Precinct Development	Edison Property Group
	Elaleni Coastal Forest Estate	North Global Properties
	Avon Power Peaking Plant Monthly Water Monitoring and Reporting	Avon Power Peaking Plant
	Birdhaven Residential development	Graham Trading and Investments Pty Ltd
2016	Oceans Umhlanga Hotel & Residential Development	Edison Property Group
	Lower Thukela Regional Bulk Water Supply Scheme	Black Balance Projects and Various Contractors for iLembe District Municipality
	Beema Bamboo to Energy Project	Green Grid Energy
	Avon Power Peaking Plant Monthly Water Monitoring and Reporting	Avon Power Peaking Plant

2015	Lower Thukela Regional Bulk Water Supply Scheme	Black Balance Projects and Various Contractors for iLembe District Municipality
2014	Tugela Ferry Shopping Centre, WWTW	Copperzone 163 (Pty) Ltd
2013	Beema Bamboo Plantation Site (Bamboo to Energy project)	Green Grid Energy
	88 Compensation Residential Beach Development - Ballito	Imali Corp / @ 88

Waste Management

2017	Waste Management Authorisation Gauteng & KZN Enquiries, BA's, Category C Registration and Compliance Assessment	Plant Care Waste Management
	Humberdale Landfill Site (Annual External Audit since 2013)	Umdoni Municipality
	Mkondeni Medical Waste Facility (Bi-Annual External Audit since 2013)	Ecocycle Waste Solutions
2014-2016	Glencoe Landfill Site (Annual External Audit since 2014)	Anderson Vogt Engineers for Endumeni Municipality
2012-2014	Waste Management Procedure for Piggery	Mrs Mbalo
	Glencoe Landfill Site (Annual External Audit since 2014)	Anderson Vogt Engineers for Endumeni Municipality
2011	Humberdale Landfill Site (Annual External Audit since 2013)	Umdoni Municipality
	Waste Management License E-Waste	Sims
	Biodiesel BA (Waste Oil)	Enterprise Ilembe
2010	Municipal Material Recovery Feasibility Study, Eastern Cape	Nelson Mandela Bay Municipality
2009	Monitoring and Rehabilitation of BP tanker spill at Chase Valley, KZN	BP South Africa (Pty) Ltd
2008	Medical Waste Incinerator	Quadrotone
2004-2006	AngloGold Ashanti Waste Management System and EMS	AngloGold Ashanti

Training

2016	PSR Landfill Training	PSR Logistics
	Environmental awareness programme to improve EMS performance- Site Supervisors	Stefanutti Stocks Civils KZN
2015	Environmental awareness programme to improve EMS performance – Site ESO's	Stefanutti Stocks Civils KZN
2010	Environmental Courses for Managers and Councillors – Local Municipality	Msunduzi Municipality
2006	Environmental Management Course for Managers	AngloGold Ashanti
	Waste Management Course	AngloGold Ashanti

Carbon Footprint Analysis and Air Emissions Licenses

As Director, ensuring the deliverables of the appointment (sourcing, calculating, evaluating and compiling of the carbon footprint analysis), is met.

2018	Carbon Footprint Analysis for Dube Trade Port	Dube TradePort Corporation
	KwaDukuza Crematorium	KwaDukuza Municipality
2017	Umgeni Water Carbon Footprint Mapping	Umgeni Water
	Karbochem Holdings in Newcastle and Sasolburg	Karbochem
	Calculate direct and indirect emissions from the company	Hychem (Pty) Ltd
2016	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	Dube TradePort Corporation
	KwaDukuza Crematorium	KwaDukuza Municipality
2015	Determine Greenhouse Gas emissions from the Mkondeni Medical Waste Facility activities	EcoCycle Waste Solutions
2010	Foundry Environmental Assessment & Authorisation	Yellow Star
	Umdoni Crematorium	Umdoni Municipality
2004-2006	AngloGold Ashanti Air Quality Management System and EMS	AngloGold Ashanti

Cooperate Social Investments and Responsibility

2017	KwaDukuza Schools Recycling Programme with the Paper Recycling Association of South Africa (PRASA) and Glass Recycling Company	Triplo4 Sustainable Solutions, PRASA & GRC
	The Circle Waste Recycling	Triplo4 Sustainable Solutions
	Mandela 67minutes	Triplo4 Sustainable Solutions
	KwaDukuza Municipality Ward 28 Greening Project	Triplo4 Sustainable Solutions & KwaDukuza Municipality
	Participate in Grace Family Church Thanksgiving Bucket Programme	Grace Family Church
2016	Westbrook Ski Boat Club Waste Management	Triplo4 Sustainable Solutions & Westbrook Ski Boat Club
	The Circle Waste Recycling	Triplo4 Sustainable Solutions
	KwaDukuza Schools Recycling Programme with the Paper Recycling Association of South Africa (PRASA) and Glass Recycling Company	Triplo4 Sustainable Solutions, PRASA & GRC
	Mandela 67 minutes Orphan Fund Initiative	Triplo4 Sustainable Solutions
	Participate in Grace Family Church Thanksgiving Bucket Programme	Grace Family Church
2015	Bhamshela Community Glass Recycling Initiative	Triplo4 Sustainable Solutions
	Entrepreneurship Waste Recycling Programme with Local Women Waste Pickers	Triplo4 Sustainable Solutions
	KwaDukuza Schools Recycling Programme with the Paper Recycling Association of South Africa (PRASA) and Glass Recycling Company	Triplo4 Sustainable Solutions
	Arbour Day	Triplo4 Sustainable Solutions & KwaDukuza Municipality

CURRICULUM VITAE

Name of Firm:	**Triplo4 Sustainable Solutions (Pty) Ltd**		
Name of Staff:	Chen Read		
Position in Firm:	Senior Environmental Consultant		
Profession:	Environmental Management		
Date of Birth:	27/07/1978		
Years of Professional Experience:	> 10	**Nationality:**	South African / Israeli (Dual)

Professional Registrations and Memberships:
Environmental Assessment Practitioner of South Africa (EAPASA)
International Association for Impact Assessment SA (IAIAsa)
African Circular Economy Network (ACEN) – Chapter Member for South Africa
Green Buildings Council of South Africa (GBCSA)
Water Institute of South Africa (WISA)
Institute of Waste Management of Southern Africa (IWMSA)

Key Qualifications:
Chen Read is a registered EAP and a Senior Environmental Consultant with Triplo4 Sustainable Solutions conducting environmental impact assessments (EIA) as well as Water Use License Applications (WULA) for a wide variety of development projects, including road infrastructure and Industrial projects as well as waste, water and coastal management projects. Chen is also actively involved in conducting compliance auditing services, as well as developing and implementing audit protocol and programmes for compliance to environmental legal requirements, and assisting with the development of corrective and preventative action plans to address non-compliance. Chen had a key role in developing and implementing the Quality and Environmental Management System, as well as obtaining the ISO 14001 and ISO 9001 certification in 2018 for Triplo4. Chen is an accredited professional of the Green Star SA (certified with the Green Building Council of South Africa), as well as certified Carbon Footprint Analyst (SETA accredited). Her international experience includes being part of the environmental compliance team for the development of ilmenite mine in Madagascar, as well as managing the Environmental Programme in a local environmental education and training centre in Madagascar, with duties included the design of academic courses and contribution to the researching, planning, and developing of the centre.

Education:

2010	Postgraduate Diploma in Environmental Management - Newcastle University, Australia;
2009	Diploma in Environmental Auditing and Reporting - Stonebridge Associated College, UK;
2008	BSC (Social Science), (cum laude) - The Open University of Israel.

Additional Courses:

2022	Inside the Circular Economy: Africa Programme - Ellen MacArthur Foundation, UK;
2019-2020	Woman On Board/ Reality Based Governance – Leadership Training Programme, Limit Breakers Global Foundation, SA;
2019	Conduct Out-come Based Assessment –EAPASA Assessor (SETA certified), Networx, SA;
2018	ISO 19011:2011 Guidelines for Auditing Management Systems, SHEQ National Cert, SA;
2016-2017	Further Education and Training: Generic Management, NQF4, Ubuhle Consultant (SETA Certified);
2016	Energy Management System, National Cleaner Production Centre (NCPC) South Africa;
2016	Hazardous Waste Management and Legislation, Institute of Waste Management of Southern Africa (IWMSA);
2015	Carbon Footprint Analyst course, NQF4, Terra Firma Academy (SETA Certified);
2014	Accredited Professional: New Building Course, The Green Building Council of South Africa;
2013	Advanced short course in Environmental Management Compliance Inspection (EMI) and Investigation, NQF 8, UNISA, South Africa;

2012 Understanding EIA – WESSA, South Africa.

Employment History:

2012 to date **Triplo4 Sustainable Solutions (Pty) Ltd, South Africa**
Senior Environmental Consultant

2011 to 2012 **The Jewish National Fund (JNF), Durban, KZN, South Africa**
Environmental-Related project Co-ordinator

2006 to 2009 **Ecological Centre Of Libanona, Fort Dauphin, Madagascar**
Environmental Programme Lecturer

2008 **Rio Tinto – QMM Project, Fort Dauphin, Madagascar**
Assistant to the Environmental Superintendent – Construction (Intern)

Environmental Experience: Selected Projects undertaken at Triplo4:

Environmental Impact Assessments (EIA) / Basic Assessment Reports/ Environmental Management Programmes/ 24G Applications/ Amendments Applications / Strategic Environmental Assessment / Planning Projects

Year	Project Name	Client
2022	Eshowe Stormwater Upgrade – Basic Assessment	Bi Infrastructure Consultants (Pty) Ltd – for Umlalazi Municipality
	Msikaba Water Supply Scheme – Part 2 Amendment	RHDHV for Ugu DM
	Gas to Power via Powerships at Port of Richards Bay – Scoping & EIR	Karpowership SA
2021	Whetstone Phase 1 – Fuel Filling Station	Cedar Point Trading 20 (Pty) Ltd
	Mnawe Road upgrade	Bi Infrastructure Consultants (Pty) Ltd – for Maphumulo Municipality
	aMahlongwa Estuarine Management Plan	Department of Economic Development, Tourism and Environmental Affairs
	Gas to Power via Powerships at Port of Richards Bay – Scoping & EIR	Karpowership SA
2020	The Strategic Corridor Development Plan for Vryheid to Ermelo	SMEC for COGTA
	Residential Dwelling Development – Prince's Grant Estate	Mr. Havnar
2019	Groutville D Sanitation Scheme	DKG for iLembe District Municipality
	Development Framework and Master Plan Update for the La Mercy Joint Venture	Dube TradePort and ACSA JV
	Estuarine Management Plan – 4 Estuaries	Umdoni Local Municipality
	Vulindlela Strategic Environmental Assessment	SMEC for Msunduzi Municipality
	Greater Inanda Local Area Plan (environmental input)	Zimanga Urban and Rural Design for eThekwini Human Settlement Department
2018	Effluent Pipeline - Maintenance Management Plan	Sappi Tugela Mill
	KwaDukuza Coastline - Maintenance Management Plan	KwaDukuza Local Municipality
	Malachite Business Park	Abland Propriety Limited
2017	Bellair Cluster 2 Housing Development	KZN Dept. of Human Settlements
	Yzermyn Underground Coal Mine, Mpumalanga	Atha Africa Ventures

Year	Project Name	Client
	Springvale Country Estate Residential Development	DG Investment / Springvale Country Estate
	Gasifier Development in Sappi Mandeni	Green Grid Energy
	Zinkwazi Beach Sewer System upgrade	Nyeleti Consulting for KwaDukuza Municipality
2016	Elaleni Coastal Forest Estate Residential Development	Cross Atlantic Properties 65
	Bellair Cluster 1 Housing Development	KZN Dept. of Human Settlements
	Ntshongweni Integrated Development Bulk Electrical Infrastructure	Tongaat Hulett Developments
	Ethafeni Precinct Housing Development	SMA Consultants for KwaDukuza Municipality
2015	Oceans Umhlanga Hotel & Residential Development	Edison Property Group
	Nonoti Housing Development	SMA Consultants for KwaDukuza Municipality
	Mpophomeni Shopping Centre	Dymatron (Pty) Ltd
2014	Mhlabatshane Bulk Water Supply Scheme Phase 2	Umgeni Water
	KwaDukuza Mall and Urban Precinct Development	Edison Property Group
	Lower Thukela Regional Bulk Water Supply Scheme	Black Balance Projects for iLembe DM
2013	The Stables Retirement Village	Kabod Development Group
	Nyathikazi Road upgrade	SMA Consultants for KwaDukuza Municipality
	Simbithi Eco Estate – Jacana Development	Silvermoon Properties
	P232 and D887 Roads upgrade	RHDHV for Department of Transport
2012	Steve Biko Phase 2 Housing Development	SMA Consultants for KwaDukuza Municipality
	Tugela Ferry Shopping Centre, WWTW and PFS	Copperzone 163 (Pty) Ltd

Water Use Licences and General Authorisations

Year	Project Name	Client
2021-2022	Perez Mixed Development, eThekwini Municipality	Mr Willis
2019 - 2021	Various Sugar Mills – Eston, Noodsberg, Gledhow	Illovo Sugar
2019	Springvale Country Estate Residential Development	DG Investment / Springvale Country Estate
2018	Wetstone Mixed Use Development	Edstan Group of Companies
	Southern Regional Bulk Water and Sanitation Scheme, KwaDukuza	Escongweni Engineers for iLembe DM
2017	Elaleni Coastal Forest Estate	Cross Atlantic Properties
	uMvoti River Sand Mining	Umdlov Omanqindi Resources
	Bellair Cluster 1 & 2 Housing Developments	KZN Dept. of Human Settlements
	Avondale Residential Development	The Horsewood Trust
2016	Avon Peaking Power Plant	Avon Peaking Power Plant (Pty) Ltd
	Bhamshela WWTW	Timocento (Pty) Ltd
	Coastlands Tongaat Hotel Development	Zelphy 1325 (Pty) Ltd

2015	Humberdale Landfill Site Phase 2 Expansion	Umdoni Municipality
	Tugela Ferry Shopping Centre	Copperzone 163 (Pty) Ltd
	Groutville Bulk Sanitation Scheme	DKG Project Manager and Engineers
	Birdhaven Residential Estate Development	Graham Trading & Investments
	Steve Biko Phase 2 Housing Development	SMA Consultants for KwaDukuza Municipality
2014	Dunkirk Estate Club House	The Dunkirk Estate
	Lower Thukela Bulk Water Supply Scheme	Black Balance Projects for iLembe DM

Environmental Control Officer (ECO) and Water Quality Monitoring

Year	Project Name	Client
2022	Bridge City Waste Facility	Plant Care Durban
	House Havnar at Prince's Grant Estate	Mr Havnar
2020	uMvoti River Sand Mining	Umdlov Omanqindi Resources
2019	Groutville D Sanitation Scheme	DKG for iLembe District Municipality
2018	Thompson's Bay Beach, Ballito, KZN	Nyeleti Consulting for KwaDukuza Municipality
	Avon Power Peaking Plant	Avon Power Peaking Plant (Pty) Ltd
	KwaDukuza Mall, Stanger, KZN	Edison Property Group
2017	Full time on site ECO for the Yzermyn Underground Coal Mine, Mpumalanga (project manager)	Atha Africa Ventures
	KwaDukuza Mall and Urban Precinct Development	Edison Property Group
	Warehouse facilities in Woodmead Estate	Shree Property Holdings
2016	Ridgeside Commercial Development	Shree Property Holdings
	Oceans Umhlanga Hotel & Residential Development	Edison Property Group
	Water Monitoring for Ground and Surface Water for the Avon Peaking Power Plant	Avon Peaking Power Plant
2015	Msikaba Water Supply Scheme Phase 1	RHDHV for Ugu DM
	Warehousing Facility at Dube Trade Port	Shree Property Holdings
	Lower Thukela Bulk Water Supply Scheme	Black Balance Projects for iLembe DM
2014	Tugela Ferry Shopping Centre, WWTW and PFS	Copperzone 163 Pty Ltd
	DTP Agrizone & Site wide external operational Audits	Dube TradePort Corporation
	Kranskop Bulk Water Supply Scheme	RHDHV for uMzinyathi DM
2013	Beema Bamboo Plantation Site (Bamboo to Energy project)	Green Grid Energy
	88 Compensation Residential Beach Development - Ballito	Imali Corp / @ 88

Waste Management and Audits

Year	Project Name	Client
2022	Mkondeni Medical Waste Facility (Bi-Annual External Audit since 2013)	Ecocycle Waste Solutions

	Green Corridor waste Facilitates – legal registrations	Green Corridor
	Scope oil waste facilities – legal registrations	Scope Oil
2020	External Compliance Audit – East London Waste Disposal Site	Buffalo City Municipality
	Enquiries and EMPr for new waste facility in Bridge City	Plant Care Durban
2019	Scoping Study for Implementation of Waste Efficiency within the KwaDukuza and Mandeni Municipalities	Vuthela IDM LED Support Programme
	External Compliance Audits – 4 Waste Disposal Facilities	Mossel Bay Municipality
2018	Waste Tyre Pyrolosis Plant, Gauteng - Environmental Opinion and EMPr	Cosmic Energy Africa
	Humberdale Landfill Site (Annual External Audit since 2013)	Umdoni Municipality
2017	Wadeville & Rosslyn Waste Management Facilities	Planet Care Gauteng
	Mkondeni Medical Waste Facility (Bi-Annual External Audit since 2013)	Ecocycle Waste Solutions
2016	Waste Management License (24G) for Springfield Facility	Plant Care Durban
	Glencoe Landfill Site (Annual External Audit since 2014)	Anderson Vogt Engineers (for Endumeni Municipality)

Carbon Footprint Analysis

Year	**Project Name**	**Client**
2018	Carbon Footprint Analysis – report and calculation tool	Dube TradePort Corporation
2017	Carbon Footprint Analysis – report and calculation tool	Umgeni Water
	Carbon Footprint Analysis – report and calculation tool	Karbochem Holdings
2016	Carbon Footprint Analysis – report and calculation tool	Dube TradePort Corporation
2015	Carbon Footprint Analysis– report and calculation tool	EcoCycle Waste Solutions

International Experience:

Madagascar

Languages:

	Speak	**Read**	**Write**
English	Excellent	Excellent	Excellent
Hebrew	Excellent	Excellent	Excellent