

GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE DEVELOPMENT AND EXPANSION OF SUBSTATION INFRASTRUCTURE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICITY



**environmental affairs**

Department:  
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REPUBLIC OF SOUTH AFRICA

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## **INTRODUCTION**

### **1. Background**

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

### **2. Purpose**

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

### **3. Objective**

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

### **4. Scope**

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

## 5. Structure of this document

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

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

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

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

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

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

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

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

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

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

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



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

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

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

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

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

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

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

## PART A – GENERAL INFORMATION

### 1. DEFINITIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

## 2. ACRONYMS and ABBREVIATIONS

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

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

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

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

Responsible Person(s)	Role and Responsibilities
Developer's Project Manager (DPM)	<p><u>Role</u></p> <p>The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). Where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation, and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"><li>- Be fully conversant with the conditions of the EA;</li><li>- Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s);</li><li>- Issuing of site instructions to the Contractor for corrective actions required;</li><li>- 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</li><li>- Ensure that periodic environmental performance audits are undertaken on the project implementation.</li></ul>

Responsible Person(s)	Role and Responsibilities
Developer Site Supervisor (DSS)	<p><u>Role</u></p> <p>The DSS reports directly to the DPM, oversees site works, liaises with the contractor(s) and the ECO. The DSS is responsible for the day to day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMPr.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- Ensure that all contractors identify a contractor's Environmental Officer (cEO);</li> <li>- Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM and ECO;</li> <li>- Must ensure that all landowners have the relevant contact details of the site staff, ECO and cEO;</li> <li>- Issuing of site instructions to the Contractor for corrective actions required;</li> <li>- Will issue all non-compliances to contractors; and</li> <li>- Ratify the Monthly Environmental Report.</li> </ul>
Environmental Control Officer (ECO)	<p><u>Role</u></p> <p>The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. The ECO provides feedback to the DSS and Project Manager regarding all environmental matters. The Contractor, cEO and dEO are answerable to the Environmental Control Officer for non-compliance with the Performance Specifications as set out in the EA and EMPr.</p> <p>The ECO provides feedback to the DSS and Project Manager, who in turn reports back to the Contractor and potential and Registered Interested &amp; Affected Parties' (RI&amp;AP's), as required. Issues of non-compliance raised by the ECO must be taken up by the Project Manager, and resolved with the Contractor as per the conditions of his contract. Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the</p>

Responsible Person(s)	Role and Responsibilities
	<p>Performance Specification) must be endorsed by the Project Manager. The ECO must also, as specified by the EA, report to the relevant CA as and when required.</p> <p><u>Responsibilities</u></p> <p>The responsibilities of the ECO will include the following:</p> <ul style="list-style-type: none"> <li>- Be aware of the findings and conclusions of all EA related to the development;</li> <li>- Be familiar with the recommendations and mitigation measures of this EMPr;</li> <li>- Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them;</li> <li>- 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;</li> <li>- Educate the construction team about the management measures contained in the EMPr and environmental licenses;</li> <li>- Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective;</li> <li>- Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements;</li> <li>- 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;</li> <li>- Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns;</li> <li>- Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr;</li> <li>- Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO);</li> <li>- Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc.) as well as corrective and preventive actions taken;</li> <li>- Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken;</li> </ul>

Responsible Person(s)	Role and Responsibilities
	<ul style="list-style-type: none"> <li>- Assisting in the resolution of conflicts;</li> <li>- Facilitate training for all personnel on the site – this may range from carrying out the training, to reviewing the training programmes of the Contractor;</li> <li>- 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;</li> <li>- Maintenance, update and review of the EMPr;</li> <li>- Communication of all modifications to the EMPr to the relevant stakeholders.</li> </ul>
<p>developer Environmental Officer (dEO)</p>	<p><u>Role</u></p> <p>The dEOs will report to the Project Manager and are responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- Be fully conversant with the EMPr;</li> <li>- Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures;</li> <li>- Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s)</li> <li>- Confine the development site to the demarcated area;</li> <li>- Conduct environmental internal audits with regards to EMPr and authorisation compliance (on cEO);</li> <li>- Assist the contractors in addressing environmental challenges on site;</li> <li>- Assist in incident management:</li> <li>- Reporting environmental incidents to developer and ensuring that corrective action is taken, and lessons learnt shared;</li> <li>- Assist the contractor in investigating environmental incidents and compile investigation reports;</li> <li>- Follow-up on pre-warnings, defects, non-conformance reports;</li> <li>- Measure and communicate environmental performance to the Contractor;</li> </ul>

Responsible Person(s)	Role and Responsibilities
	<ul style="list-style-type: none"> <li>- Conduct environmental awareness training on site together with ECO and cEO;</li> <li>- Ensure that the necessary legal permits and / or licenses are in place and up to date;</li> <li>- Acting as Developer's Environmental Representative on site and work together with the ECO and contractor;</li> </ul>
Contractor	<p><u>Role</u></p> <p>The Contractor appoints the cEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr while performing the onsite activities as per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion of substation infrastructure for the transmission and distribution of electricity activities.</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- project delivery and quality control for the development services as per appointment;</li> <li>- 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;</li> <li>- 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;</li> <li>- attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones;</li> <li>- 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.</li> </ul>
contractor Environmental Officer (cEO)	<p><u>Role</u></p> <p>Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is</p>



Responsible Person(s)	Role and Responsibilities
	<p>appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria:</p> <p><u>Responsibilities</u></p> <ul style="list-style-type: none"> <li>- Be on site throughout the duration of the project and be dedicated to the project;</li> <li>- Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site;</li> <li>- Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr and Method Statements;</li> <li>- Attend the Environmental Site Meeting;</li> <li>- Undertaking corrective actions where non-compliances are registered within the stipulated timeframes;</li> <li>- Report back formally on the completion of corrective actions;</li> <li>- Assist the ECO in maintaining all the site documentation;</li> <li>- Prepare the site inspection reports and corrective action reports for submission to the ECO;</li> <li>- Assist the ECO with the preparing of the monthly report; and</li> <li>- Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint a cEO representing that company.</li> </ul>

#### **4. ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE**

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

##### **4.1 Document control/Filing system**

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

##### **4.2 Documentation to be available**

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

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

##### **4.3 Weekly Environmental Checklist**

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

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

#### 4.4 Environmental site meetings

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

#### 4.5 Required Method Statements

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

The method statement must cover applicable details with regard to:

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

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

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

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

#### 4.6 Environmental Incident Log (Diary)

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

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

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

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

The Environmental Incident Log will be captured in the EAR.

#### 4.7 Non-compliance

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

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

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

#### 4.8 Corrective action records

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

#### 4.9 Photographic record

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

The Contractor shall:

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

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

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

#### 4.10 Complaints register

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

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

#### 4.11 Claims for damages

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

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

#### 4.12 Interactions with affected parties

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

The ECOs shall:

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

#### 4.13 Environmental audits

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

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

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

#### 4.14 Final environmental audits

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

## **PART B: SECTION 1: Pre-approved generic EMPr template**

### **5. IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS**

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

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

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



## 5.1 Environmental awareness training

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

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– All staff must receive environmental awareness training prior to commencement of the activities;</li> <li>– The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course;</li> <li>– Refresher environmental awareness training is available as and when required;</li> <li>– 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;</li> <li>– The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum:               <ul style="list-style-type: none"> <li>a) Safety notifications; and</li> <li>b) No littering.</li> </ul> </li> <li>– Environmental awareness training must include as a minimum the following:               <ul style="list-style-type: none"> <li>a) Description of significant environmental impacts, actual or potential, related to their work activities;</li> <li>b) Mitigation measures to be implemented when carrying out specific activities;</li> </ul> </li> </ul>	ECO and cEO	Environmental Induction training; Toolbox talks; other pertinent training aids	Initially prior to construction commencing ECO to induct Construction Management and cEO, and thereafter repeated for all new employees and yearly. Toolbox talks to be presented weekly	ECO	Monthly	Signed induction and toolbox talk, or training registers

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
c) Emergency preparedness and response procedures; d) Emergency procedures; e) Procedures to be followed when working near or within sensitive areas; f) Wastewater management procedures; g) Water usage and conservation; h) Solid waste management procedures; i) Sanitation procedures; j) Fire prevention; and k) Disease prevention.  – A record of all environmental awareness training courses undertaken as part of the EMPr must be available; – Educate workers on the dangers of open and/or unattended fires; – A staff attendance register of all staff to have received environmental awareness training must be available. – Course material must be available and presented in appropriate languages that all staff can understand.						

## 5.2 Site Establishment development

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

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– 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;</li> <li>– 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;</li> <li>– Sites must be located where possible on previously disturbed areas;</li> <li>– The camp must be fenced in accordance with <b>Section 5.5: Fencing and gate installation</b>; and</li> <li>– The use of existing accommodation for contractor staff, where possible, is encouraged.</li> </ul>	<b>Contractor</b>	<b>Method Statement compilation and communication of Method Statements to employees. Use of EIA and Specialist Studies to locate site camps</b>	<b>Prior to construction</b>	<b>ECO</b>	<b>Monthly</b>	<b>Signed Method Statements; signed proof of communication register; Liaison with ECO regarding site camp placement</b>

### 5.3 Access restricted areas

**Impact management outcome:** Access to restricted areas prevented.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any additional areas identified during development;</li> <li>– 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</li> <li>– Unauthorised access and development related activity inside access restricted areas is prohibited.</li> </ul>	<b>Contractor</b>	<b>Use of EIA/BA and Specialist Studies to locate sensitive areas and 'no-go' areas</b>	<b>Prior to construction in new areas</b>	<b>ECO</b>	<b>Monthly</b>	<b>Contractor compliance with sensitive areas and 'no-go' areas identified in EIA/BA and Specialist Studies</b>

#### 5.4 Access roads

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

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities;</li> <li>– 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</li> </ul>	<b>Contractor</b>	<b>Implementation of mitigation measures</b>	<b>Ongoing.</b>	<b>ECO</b>	<b>Monthly</b>	<b>Signed access agreements and maintenanc</b>

<ul style="list-style-type: none"> <li>– All contractors must be made aware of all these access routes.</li> <li>– Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense;</li> <li>– Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads;</li> <li>– In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with <b>section 4.9: photographic record</b>; prior to use and the condition thereof agreed by the landowner, the DPM, and the contractor;</li> <li>– Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands</li> <li>– Access roads must only be developed on a pre-planned and approved roads.</li> </ul>						<b>e of access roads</b>
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## 5.5 Fencing and Gate installation

**Impact management outcome:** Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Use existing gates provided to gain access to all parts of the area authorised for development, where possible;</li> </ul>	<b>Contractor and Applicant</b>	<b>Implementation of the mitigation measures</b>	<b>Ongoing.</b>	<b>ECO</b>	<b>Monthly</b>	<b>Site observation; public</b>

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Existing and new gates to be recorded and documented in accordance with <b>section 4.9: photographic record</b>;</li> <li>All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner;</li> <li>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;</li> <li>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;</li> <li>Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate;</li> <li>Original tension must be maintained in the fence wires;</li> <li>All gates installed in electrified fencing must be re-electrified;</li> <li>All demarcation fencing and barriers must be maintained in good working order for the duration of the development activities;</li> <li>Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where applicable;</li> <li>Any temporary fencing to restrict the movement of life-stock must only be erected with the permission of the land owner.</li> <li>All fencing must be developed of high quality material bearing the SABS mark;</li> <li>The use of razor wire as fencing must be avoided;</li> </ul>						<b>complaints register</b>

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>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;</li> <li>On completion of the development phase all temporary fences are to be removed;</li> <li>The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely.</li> </ul>						

## 5.6 Water Supply Management

**Impact management outcome:** Undertake responsible water usage.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– 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;</li> <li>– The Contractor must ensure the following:               <ul style="list-style-type: none"> <li>a. The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river;</li> <li>b. No damage occurs to the river bed or banks and that the abstraction of water does not entail stream diversion activities; and</li> <li>c. All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented.</li> </ul> </li> <li>– Ensure water conservation is being practiced by:               <ul style="list-style-type: none"> <li>a. Minimising water use during cleaning of equipment;</li> <li>b. Undertaking regular audits of water systems; and</li> <li>c. Including a discussion on water usage and conservation during environmental awareness training.</li> <li>d. The use of grey water is encouraged.</li> </ul> </li> </ul>	<b>Contractor and Applicant</b>	<b>Application to DWS where applicable. Implementation of mitigation measures</b>	<b>Construction</b>	<b>ECO</b>	<b>Monthly</b>	<b>Proof of water source used; submission of above proof to DWS</b>

### 5.7 Storm and waste water management

**Impact management outcome:** Impacts to the environment caused by storm water and wastewater discharges during construction are avoided.



Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– 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;</li> <li>– 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;</li> <li>– 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;</li> <li>– Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the Project Manager's approval and support by the ECO.</li> </ul>	<b>Contractor</b>	<b>Employ methods to prevent water pollution</b>	<b>Construction</b>	<b>ECO</b>	<b>Weekly</b>	<b>Inspection of areas where construction takes place near watercourses</b>

### 5.8 Solid and hazardous waste management

**Impact management outcome:** Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility.

Impact Management Actions	Implementation	Monitoring
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	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– All measures regarding waste management must be undertaken using an integrated waste management approach;</li> <li>– Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided;</li> <li>– A suitably positioned and clearly demarcated waste collection site must be identified and provided;</li> <li>– The waste collection site must be maintained in a clean and orderly manner;</li> <li>– Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal;</li> <li>– Staff must be trained in waste segregation;</li> <li>– Bins must be emptied regularly;</li> <li>– General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company;</li> <li>– Hazardous waste must be disposed of at a registered waste disposal site;</li> <li>– Certificates of safe disposal for general, hazardous and recycled waste must be maintained.</li> <li>– <u>It is encouraged that waste awareness should be promoted to all staff, contractors and visitors.</u></li> <li>– <u>Adequate waste containment and disposal measures should be provided to prevent polluting the surrounding environment, and to ensure the prevention and minimisation of waste.</u></li> <li>– <u>It is also recommended that applicant ensures that all recyclable waste generated during the construction and</u></li> </ul>	<b>Contractor</b>	<b>Following good waste management practices outlined in approved method statement</b>	<b>Construction</b>	<b>ECO</b>	<b>Weekly</b>	<b>Waste safe disposal slips; Service Level Agreements</b>

<p>operational phases of the development are managed and made available to recyclers.</p> <p>– <u>Signage must be used to prevent littering and illegal dumping. There must be visible signage to prevent any littering and illegal dumping from occurring throughout the lifecycle of the project.</u></p>						
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## 5.9 Protection of watercourses and estuaries

**Impact management outcome:** Pollution and contamination of the watercourse environment and or estuary erosion are prevented.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>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;</li> <li>In the event of a spill, prompt action must be taken to clear the polluted or affected areas;</li> <li>Where possible, no development equipment must traverse any seasonal or permanent wetland</li> <li>No return flow into the estuaries must be allowed and no disturbance of the Estuarine functional Zone should occur;</li> <li>Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available;</li> </ul>	<b>Contractor</b>	<b>Method statements; Stormwater Management Plan</b>	<b>Construction</b>	<b>ECO</b>	<b>Weekly</b>	<b>Method Statement compliance</b>

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– There must not be any impact on the long term morphological dynamics of watercourses or estuaries;</li> <li>– Existing crossing points must be favored over the creation of new crossings (including temporary access)</li> <li>– When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken:               <ul style="list-style-type: none"> <li>a) Water levels during the period of construction; No altering of the bed, banks, course or characteristics of a watercourse</li> <li>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;</li> <li>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</li> <li>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.</li> </ul> </li> </ul>						

### 5.10 Vegetation clearing

**Impact management outcome:** Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<b>General:</b> <ul style="list-style-type: none"> <li>Indigenous vegetation which does not interfere with the development must be left undisturbed;</li> <li><u>It is recommended that any vegetation removed during site clearance be chipped for processing of mulch or utilised for composting purposes.</u></li> <li>Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species;</li> <li>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;</li> <li>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;</li> <li>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;</li> <li>Trees felled due to construction must be documented and</li> </ul>	<b>Contractor and Applicant</b>	<b>Specialist recommendations; Method statement; Search and Rescue Plan; Alien vegetation removal Plan (approved plans and strategies used by Eskom), site awareness</b>	<b>Pre-Construction and Construction and Operation</b>	<b>ECO</b>	<b>Pre-Construction and weekly during construction</b>	<b>Compliance to method statements and Search and Rescue Plan; Alien vegetation removal Plan. Approved plans and strategies used by Eskom.</b>

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p>form part of the Environmental Audit Report;</p> <ul style="list-style-type: none"> <li>– Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris;</li> <li>– 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;</li> <li>– A daily register must be kept of all relevant details of herbicide usage;</li> <li>– No herbicides must be used in estuaries;</li> <li>– All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance to <b>Section 5.3: Access restricted areas</b>.</li> </ul> <p>Alien invasive vegetation must be removed and disposed of at a licensed waste management facility.</p>						

#### 5.11 Protection of fauna

**Impact management outcome:** Disturbance to fauna is minimised.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present;</li> <li>– The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme;</li> <li>– 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;</li> <li>– Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds;</li> <li>– 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;</li> <li>– No deliberate or intentional killing of fauna is allowed;</li> <li>– 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</li> <li>– 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.</li> </ul>	<b>Contractor</b>	<b>Method statement and adherence to exclusion/no-go zones; site awareness</b>	<b>Construction</b>	<b>ECO</b>	<b>Weekly</b>	<b>Public complaints register; adherence to exclusion/no-go zones and method statements</b>

### 5.12 Protection of heritage resources

**Impact management outcome:** Impact to heritage resources is minimised.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Identify, demarcate and prevent impact to all known sensitive heritage features on site in accordance with the No-Go procedure in <b>Section 5.3: Access restricted areas</b>;</li> <li>Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance;</li> <li>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.</li> </ul>	<b>Contractor</b>	<b>Method Statement; Heritage management plan</b>	<b>Pre-construction and construction</b>	<b>ECO</b>	<b>Weekly and daily for zones highlighted by Heritage Specialist where potsherds were found</b>	<b>Monitoring of construction areas, adherence to management plan if change finds found.</b>

### 5.13 Safety of the public

**Impact management outcome:** All precautions are taken to minimise the risk of injury, harm or complaints.



Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>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.;</li> <li>All unattended open excavations must be adequately fenced or demarcated;</li> <li>Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding;</li> <li>Ensure structures vulnerable to high winds are secured;</li> <li>Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.</li> </ul>	<b>Contractor</b>	<b>Landowner agreements; Method Statement</b>	<b>Construction</b>	<b>ECO</b>	<b>Weekly</b>	<b>Site works barricaded, safe working site maintained, public complaints register.</b>

#### 5.14 Sanitation

**Impact management outcome:** Clean and well maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Mobile chemical toilets are installed onsite if no other ablution facilities are available;</li> </ul>	<b>Contractor</b>	<b>Service level agreement with Service provider;</b>	<b>Construction</b>	<b>ECO</b>	<b>Weekly</b>	<b>Service level agreement</b>

<ul style="list-style-type: none"> <li>– 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;</li> <li>– Where mobile chemical toilets are required, the following must be ensured: <ul style="list-style-type: none"> <li>a) Toilets are located no closer than 100 m to any watercourse or water body;</li> <li>b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause;</li> <li>c) No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the EMPr;</li> <li>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;</li> <li>e) Toilets are emptied before long weekends and workers holidays, and must be locked after working hours;</li> <li>f) Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards;</li> </ul> </li> <li>– A copy of the waste disposal certificates must be maintained.</li> </ul>		<b>Method statement; site awareness</b>				<b>with service provider, proof of safe disposal of waste</b>
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### 5.15 Prevention of disease

**Impact Management outcome:** All necessary precautions linked to the spread of disease are taken.

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

<ul style="list-style-type: none"> <li>– Undertake environmentally-friendly pest control in the camp area;</li> <li>– Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS;</li> <li>– The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area;</li> <li>– Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable;</li> <li>– Free condoms must be made available to all staff on site at central points;</li> <li>– Medical support must be made available;</li> <li>– Provide access to Voluntary HIV Testing and Counselling Services.</li> </ul>	<b>Contractor</b>	<b>Method statement, awareness training</b>	<b>Construction</b>	<b>ECO</b>	<b>Monthly</b>	<b>Method statement, proof of awareness training</b>
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#### 5.16 Emergency procedures

**Impact management outcome:** Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.

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

<ul style="list-style-type: none"> <li>– Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project;</li> <li>– The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation;</li> <li>– All staff must be made aware of emergency procedures as part of environmental awareness training;</li> <li>– The relevant local authority must be made aware of a fire as soon as it starts;</li> <li>– In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see <b>Hazardous Substances section 5.17</b>).</li> </ul>	<b>Contractor</b>	<b>Environmental Emergency Response Action Plan</b>	<b>Construction</b>	<b>ECO</b>	<b>Monthly</b>	<b>Adherence /compliance to ERAP</b>
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### 5.17 Hazardous substances

**Impact management outcome:** Safe storage, handling, use and disposal of hazardous substances.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible;</li> <li>– All hazardous substances must be stored in suitable containers as defined in the Method Statement;</li> <li>– Containers must be clearly marked to indicate contents, quantities and safety requirements;</li> </ul>	<b>Contractor</b>	<b>Method Statement, OHS requirements; adequate and responsible use and storage of Hazardous Substances, Hazardous</b>	<b>Construction</b>	<b>ECO</b>	<b>Weekly</b>	<b>Hazardous Substance Storage Register, MSDS, Method Statement</b>

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers;</li> <li>– Bunded areas to be suitably lined with a SABS approved liner;</li> <li>– An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis;</li> <li>– All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS);</li> <li>– All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet;</li> <li>– 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;</li> <li>– The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowzers;</li> <li>– The tanks/ bowzers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 110% of the total capacity of all the storage tanks/ bowzers;</li> <li>– The floor of the bund must be sloped, draining to an oil separator;</li> <li>– Provision must be made for refueling at the storage area by protecting the soil with an impermeable groundcover. Where</li> </ul>		<b>Substances storage register</b>				

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<p>dispensing equipment is used, a drip tray must be used to ensure small spills are contained;</p> <ul style="list-style-type: none"> <li>– All empty externally dirty drums must be stored on a drip tray or within a bunded area;</li> <li>– No unauthorised access into the hazardous substances storage areas must be permitted;</li> <li>– No smoking must be allowed within the vicinity of the hazardous storage areas;</li> <li>– Adequate fire-fighting equipment must be made available at all hazardous storage areas;</li> <li>– 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;</li> <li>– 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;</li> <li>– The responsible operator must have the required training to make use of the spill kit in emergency situations;</li> <li>– <u>In the event of a significant spill or leak of hazardous substances (e.g., petrol, diesel, etc.) used during the proposed activities, such an incident(s) must be reported to the relevant authorities, including the Directorate: Pollution and Chemicals Management, in accordance with section 30 of the NEMA, 1998.</u></li> <li>– An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken;</li> </ul>						

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>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 <b>Section 5.7</b> for procedures concerning <b>storm and waste water management</b> and <b>5.8</b> for <b>solid and hazardous waste management</b>.</li> </ul>						

#### 5.18 Workshop, equipment maintenance and storage

**Impact management outcome:** Soil, surface water and groundwater contamination is minimised.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area;</li> <li>During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts;</li> <li>Leaking equipment must be repaired immediately or be removed from site to facilitate repair;</li> </ul>	<b>Contractor</b>	<b>Method Statement, OHS requirements; Hazardous Substances storage register, vehicle daily checklist,</b>	<b>Construction</b>	<b>ECO</b>	<b>Weekly</b>	<b>Method Statement, Hazardous Substances storage register, vehicle daily checklist,</b>

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Workshop areas must be monitored for oil and fuel spills;</li> <li>Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available;</li> <li>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;</li> <li>Water drainage from the workshop must be contained and managed in accordance Section <b>5.7: Storm and waste water management</b>.</li> </ul>		<b>vehicle service register</b>				<b>vehicle service register</b>

### 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
<ul style="list-style-type: none"> <li>Concrete mixing must be carried out on an impermeable surface;</li> <li>Batching plants areas must be fitted with a containment facility for the collection of cement laden water.</li> <li>Dirty water from the batching plant must be contained to prevent soil and groundwater contamination</li> </ul>	<b>Contractor</b>	<b>Method Statement</b>	<b>Construction</b>	<b>ECO</b>	<b>Weekly</b>	<b>Compliance to mitigation and method statement</b>



<ul style="list-style-type: none"> <li>– Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains;</li> <li>– A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted;</li> <li>– Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility;</li> <li>– Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site;</li> <li>– Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to <b>Section 5.20: Dust emissions</b>)</li> <li>– 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;</li> <li>– Temporary fencing must be erected around batching plants in accordance with Section <b>5.5: Fencing and gate installation</b>.</li> </ul>						
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## 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
<ul style="list-style-type: none"> <li>– Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO;</li> </ul>	<b>Contractor</b>	<b>Method Statement, Vehicle Speed</b>	<b>Construction</b>	<b>ECO</b>	<b>Monthly</b>	<b>Site observations, dust</b>

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– 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;</li> <li>– Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present;</li> <li>– 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;</li> <li>– Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind;</li> <li>– Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO;</li> <li>– Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas;</li> <li>– Straw stabilisation must be applied at a rate of one bale/10 m<sup>2</sup> and harrowed into the top 100 mm of top material, for all completed earthworks;</li> <li>– For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.</li> </ul>		<b>limit, dust suppression</b>				<b>suppression register</b>

### 5.21 Blasting

**Impact management outcome:** Impact to the environment is minimised through a safe blasting practice.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Any blasting activity must be conducted by a suitably licensed blasting contractor; and</li> <li>Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site.</li> </ul>	<b>Contractor</b>	<b>Relevant legislation and regulation</b>	<b>Construction</b>	<b>ECO</b>	<b>Monthly</b>	<b>Public complaints register; proof of registration of blasting contractor.</b>

### 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
<ul style="list-style-type: none"> <li>The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only;</li> </ul>	<b>Contractor</b>	<b>Restriction of site hours to working</b>	<b>Construction</b>	<b>ECO</b>	<b>Monthly</b>	<b>Public Complaints Register</b>

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained;</li> <li>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;</li> <li>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.</li> </ul>		<b>hours Monday to Friday</b>				

### 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
<ul style="list-style-type: none"> <li>Designate smoking areas where the fire hazard could be regarded as insignificant;</li> </ul>	<b>Contractor</b>	<b>Emergency Response Action</b>	<b>Construction</b>	<b>ECO</b>	<b>Monthly</b>	<b>Public complaints register;</b>

<ul style="list-style-type: none"> <li>– Firefighting equipment must be available on all vehicles located on site;</li> <li>– The local Fire Protection Agency (FPA) must be informed of construction activities;</li> <li>– Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site;</li> <li>– Two-way swap of contact details between ECO and FPA.</li> </ul>		<b>Plan; Method Statement</b>				<b>compliance to ERAP</b>
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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
<ul style="list-style-type: none"> <li>– 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;</li> <li>– All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods;</li> <li>– Topsoil stockpiles must not exceed 2 m in height;</li> <li>– During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.);</li> </ul>	<b>Contractor</b>	<b>Method Statement</b>	<b>Construction</b>	<b>ECO</b>	<b>Monthly</b>	<b>Method Statement and site observations</b>

<ul style="list-style-type: none"> <li>Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material.</li> </ul>						
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### 5.25 Civil works

**Impact management outcome:** Impact to the environment minimised during civil works to create the substation terrace.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Where terracing is required, topsoil must be collected and retained for the purpose of re-use later to rehabilitate disturbed areas not covered by yard stone;</li> <li>Areas to be rehabilitated include terrace embankments and areas outside the high voltage yards;</li> <li>Where required, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled;</li> <li>These areas can be stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly;</li> </ul>	<b>Contractor</b>	<b>Method Statement</b>	<b>Construction</b>	<b>ECO</b>	<b>Monthly</b>	<b>Site observation</b>

<ul style="list-style-type: none"> <li>– Rehabilitation of the disturbed areas must be managed in accordance with <b>Section 5.35: Landscaping and rehabilitation</b>;</li> <li>– All excess spoil generated during terracing activities must be disposed of in an appropriate manner and at a recognised landfill site; and</li> <li>– Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes.</li> </ul>						
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## 5.26 Excavation of foundation, cable trenching and drainage systems

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

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– 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;</li> <li>– Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes;</li> <li>– Management of equipment for excavation purposes must be undertaken in accordance with <b>Section 5.18: Workshop, equipment maintenance and storage</b>; and</li> <li>– Hazardous substances spills from equipment must be managed in accordance with <b>Section 5.17: Hazardous substances</b>.</li> </ul>	<b>Contractor</b>	<b>Method Statement and Engineering Drawings</b>	<b>Construction</b>	<b>ECO</b>	<b>Weekly</b>	<b>Adherence to method statements</b>

### 5.27 Installation of foundations, cable trenching and drainage systems

**Impact management outcome:** No environmental degradation occurs during the installation of foundation, cable trenching and drainage system.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Batching of cement to be undertaken in accordance with <b>Section 5.19: Batching plants</b>; and</li> <li>Residual solid waste must be disposed of in accordance with <b>Section 5.8: Solid waste and hazardous management</b>.</li> </ul>	<b>Contractor</b>	<b>Method Statement</b>	<b>Construction</b>	<b>Contractor and ECO</b>	<b>Weekly</b>	<b>Method Statement and site observations</b>

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

**Impact management outcome:** No environmental degradation occurs as a result of installation of equipment.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Management of dust must be conducted in accordance with <b>Section 5.20: Dust emissions</b>;</li> <li>Management of equipment used for installation must be conducted in accordance with <b>Section 5.18: Workshop, equipment maintenance and storage</b>;</li> <li>Management hazardous substances and any associated spills must be conducted in accordance with <b>Section 5.17: Hazardous substances</b>; and</li> </ul>	<b>Contractor</b>	<b>Method Statement</b>	<b>Construction</b>	<b>ECO</b>	<b>Weekly</b>	<b>Method Statement and site observation</b>



Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Residual solid waste must be recycled or disposed of in accordance with <b>Section 5.8: Solid waste and hazardous management</b>.</li> </ul>						

### 5.29 Steelwork Assembly and Erection

**Impact management outcome:** No environmental degradation occurs as a result of steelwork assembly and erection.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>During assembly, care must be taken to ensure that no wasted/unused materials are left on site e.g. bolts and nuts</li> <li>Emergency repairs due to breakages of equipment must be managed in accordance with <b>Section 5. 18: Workshop, equipment maintenance and storage</b> and <b>Section 5.16: Emergency procedures</b>.</li> </ul>	<b>Contractor</b>	<b>Method Statement</b>	<b>Construction</b>	<b>ECO</b>	<b>Weekly</b>	<b>Site Observations</b>

### 5.30 Cabling and Stringing

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

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Residual solid waste (off cuts etc.) shall be recycled or disposed of in accordance with <b>Section 6.8: Solid waste and hazardous Management;</b></li> <li>Management of equipment used for installation shall be conducted in accordance with <b>Section 5.18: Workshop, equipment maintenance and storage;</b></li> <li>Management hazardous substances and any associated spills shall be conducted in accordance with <b>Section 5.17: Hazardous substances.</b></li> </ul>	<b>Contractor</b>	<b>Method Statement, adherence to exclusion zones</b>	<b>Construction</b>	<b>ECO</b>	<b>Weekly</b>	<b>Site observations</b>

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

**Impact management outcome:** No environmental degradation occurs as a result of Testing and Commissioning.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Residual solid waste must be recycled or disposed of in accordance with <b>Section 5.8: Solid waste and hazardous management</b>.</li> </ul>	<b>Contractor</b>	<b>Method Statement</b>	<b>Construction</b>	<b>ECO</b>	<b>Weekly</b>	<b>Site observation</b>

### 5.32 Socio-economic

**Impact management outcome:** enhanced socio-economic development.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Develop and implement communication strategies to facilitate public participation;</li> <li>Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process;</li> <li>Sustain continuous communication and liaison with neighboring owners and residents</li> </ul>	<b>Contractor</b>	<b>Landowner Agreements; Issues and Complaints Register</b>	<b>Construction</b>	<b>ECO</b>	<b>Monthly</b>	<b>Landowner Agreement; Issues and Complaints Register</b>

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Create work and training opportunities for local stakeholders; and</li> <li>– 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.</li> </ul>						

### 5.33 Temporary closure of site

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

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in <b>sections 5.17: Hazardous substances and 5.18: Workshop, equipment maintenance and storage</b>;</li> <li>– Hazardous storage areas must be well ventilated;</li> <li>– Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service;</li> <li>– Emergency and contact details displayed must be displayed;</li> <li>– Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel;</li> </ul>	<b>Contractor</b>	<b>Method statement</b>	<b>Construction – when applicable</b>	<b>ECO</b>	<b>Monthly – when applicable</b>	<b>Method statement</b>  <b>ECO reports</b>

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– Night hazards such as reflectors, lighting, traffic signage etc. must have been checked;</li> <li>– Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.;</li> <li>– Structures vulnerable to high winds must be secured;</li> <li>– Wind and dust mitigation must be implemented;</li> <li>– Cement and materials stores must have been secured;</li> <li>– Toilets must have been emptied and secured;</li> <li>– Refuse bins must have been emptied and secured;</li> <li>– Drip trays must have been emptied and secured.</li> </ul>						

#### 5.34 Dismantling of old equipment

**Impact management outcome:** Impact to the environment to be minimised during the dismantling, storage and disposal of old equipment commissioning.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– All old equipment removed during the project must be stored in such a way as to prevent pollution of the environment;</li> <li>– Oil containing equipment must be stored to prevent leaking or be stored on drip trays;</li> </ul>	<b>Contractor</b>	<b>Method statement</b>	<b>Construction and decommissioning</b>	<b>ECO</b>	<b>Monthly – when applicable</b>	<b>Site observation</b>

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– All scrap steel must be stacked neatly and any disused and broken insulators must be stored in containers;</li> <li>– Once material has been scrapped and the contract has been placed for removal, the disposal Contractor must ensure that any equipment containing pollution causing substances is dismantled and transported in such a way as to prevent spillage and pollution of the environment;</li> <li>– The Contractor must also be equipped to contain and clean up any pollution causing spills; and</li> <li>– Disposal of unusable material must be at a licensed waste disposal site.</li> </ul>						

### 5.35 Landscaping and rehabilitation

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

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– 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;</li> </ul>	<b>Contractor</b>	<b>Method Statements; erosion protection; alien eradication plan</b>	<b>Concurrent with Construction</b>	<b>ECO</b>	<b>Monthly</b>	<b>Adequately revegetated work areas; no erosion or</b>

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>– 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</li> <li>– 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;</li> <li>– 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;</li> <li>– 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;</li> <li>– Rehabilitation of access roads outside of farmland;</li> <li>– Indigenous species must be used for with species and/grasses to where it compliments or approximates the original condition;</li> <li>– Stockpiled topsoil must be used for rehabilitation (refer to <b>Section 5.24: Stockpiling and stockpiled areas</b>);</li> <li>– Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion;</li> <li>– Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed;</li> <li>– Subsoil must be ripped before topsoil is placed;</li> <li>– The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment;</li> </ul>						<b>invasive plant species</b>

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled;</li> <li>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;</li> <li>Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil.</li> <li>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: <ul style="list-style-type: none"> <li>a) Annual and perennial plants are chosen;</li> <li>b) Pioneer species are included;</li> <li>c) Species chosen must be indigenous to the area with the seeds used coming from the area;</li> <li>d) Root systems must have a binding effect on the soil;</li> <li>e) The final product must not cause an ecological imbalance in the area</li> </ul> </li> </ul>						

## 6 ACCESS TO THE GENERIC EMPr

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



## PART B: SECTION 2

### 7 SITE SPECIFIC INFORMATION AND DECLARATION

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

7.1.1 Details of the applicant: **South Africa Mainstream Renewable Power Developments (Pty) Ltd**

Name of applicant: **Eugene Marais**

Tel No: **073 871 5781**

Fax No: **021 671 5665**

Postal Address: **PO Box 45063, CLAREMONT, Cape Town**

Physical Address: **4th Floor Mariendahl House, Newlands on Main, Cnr Main Road and Campground, Claremont, Cape Town**

#### 7.1.2 Details and expertise of the EAP:

Name of applicant: **SiVEST SA (Pty) Ltd**

Tel No: **+27 11 798 0634**

Fax No: **N/A**

E-mail address: [nataliep@sivest.com](mailto:nataliep@sivest.com)

Expertise of the EAP (Curriculum Vitae included): **Yes, included in the BA Application**

#### 7.1.3 Project name:

**PROPOSED DEVELOPMENT OF THE 132KV PORTION / YARD OF THE 33KV/132KV PORTION OF THE SHARED ON-SITE SUBSTATION AND ASSOCIATED 132KV POWER LINE FOR THE HEUWELTJIES WIND ENERGY FACILITY (WEF), NEAR BEAUFORT WEST IN THE PRINCE ALBERT LOCAL MUNICIPALITY, CENTRAL KAROO DISTRICT IN THE WESTERN CAPE PROVINCE**

#### 7.1.4 Description of the project:

**Mainstream is proposing to develop the 132kv portion / yard of the shared 33/132kv on-site substation as well as one (1) new associated 132kV overhead power line for the proposed Heuweltjies Wind Energy Facility (WEF) (part of a separate BA process / application with DFFE reference number still to be allocated), near the town of Beaufort West in the Western Cape Province of South Africa. The overall objective of the proposed development is to feed the electricity generated by the proposed Heuweltjies WEF into the national grid. The 132kv portion / yard of the shared 33/132kv on-site substation and 132kV overhead power line requires a separate Environmental Authorisation (EA). This will facilitate an ease of transfer over to Eskom once the onsite substation overhead line is constructed.**

**The on-site substation will be a step-up substation and will include an Independent Power Producer (IPP) portion (33kv portion/yard of the shared 33/132kv onsite substation) and an Eskom portion (132kv portion/yard of the shared 33kv/132kv onsite substation – this portion will be ceded**

to Eskom once the onsite substation is constructed and the necessary transfer of rights undertaken), hence the IPP portion (33kv portion/yard of the shared 33/132kv onsite substation) has been included in the WEF EIA process and the Eskom portion (132kv portion/yard of the shared 33kv/132kv onsite substation) and associated 132kv overhead line, included in grid connection infrastructure BA process (i.e. this application). This will facilitate an ease of transfer over to Eskom once the onsite substation is constructed.

#### 7.1.5 Project location:

The proposed WEF and associated grid infrastructure is located approximately 70km south of Beaufort West in the Western Cape Province and is within the Prince Albert Local Municipality, in the Central Karoo District Municipality

The application site for the proposed WEF development incorporates the following three (3) farm portions / properties:

- Remainder of the Farm Witpoortje No 16
- Portion 8 Of The Farm Klipgat No.114

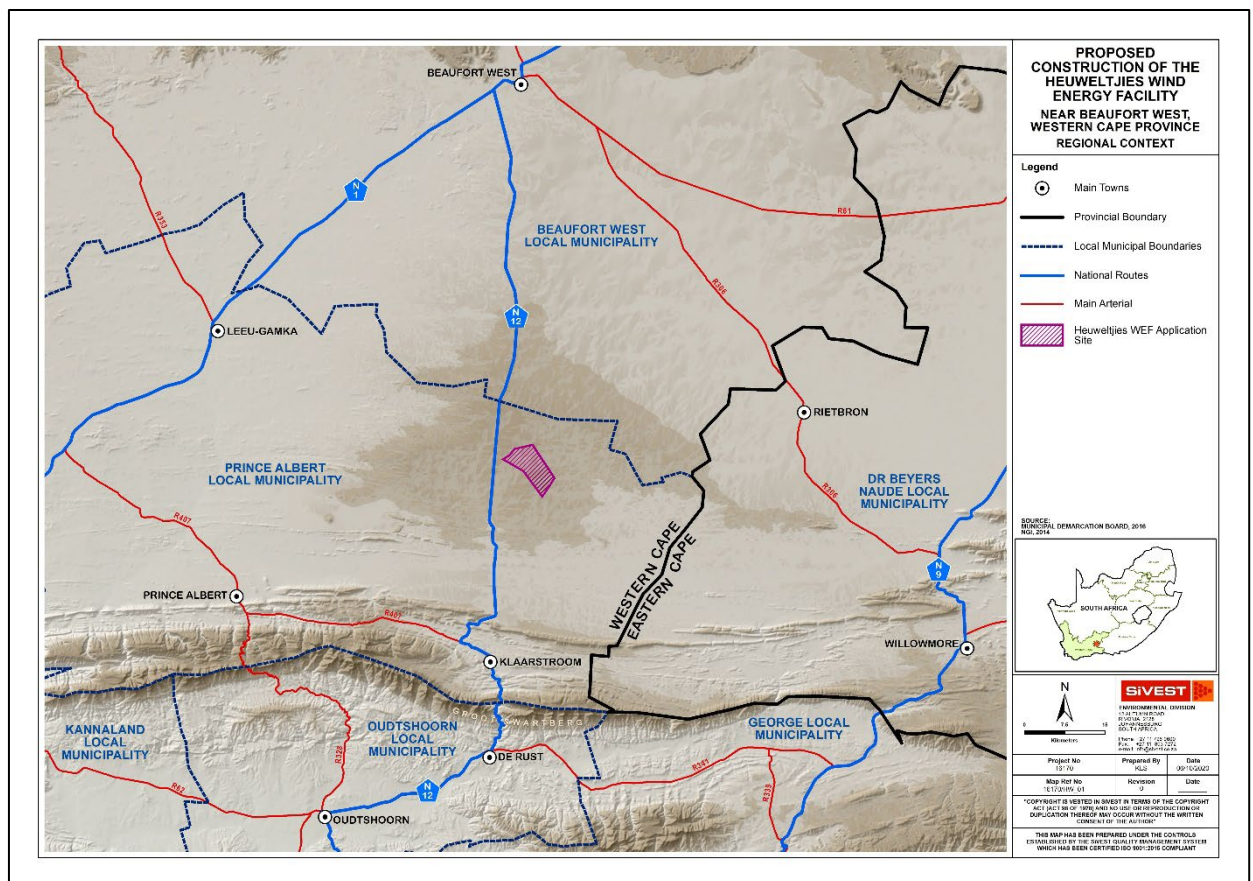


Figure 1: Regional Context

7.2 Sub-section 2: Development footprint site map

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

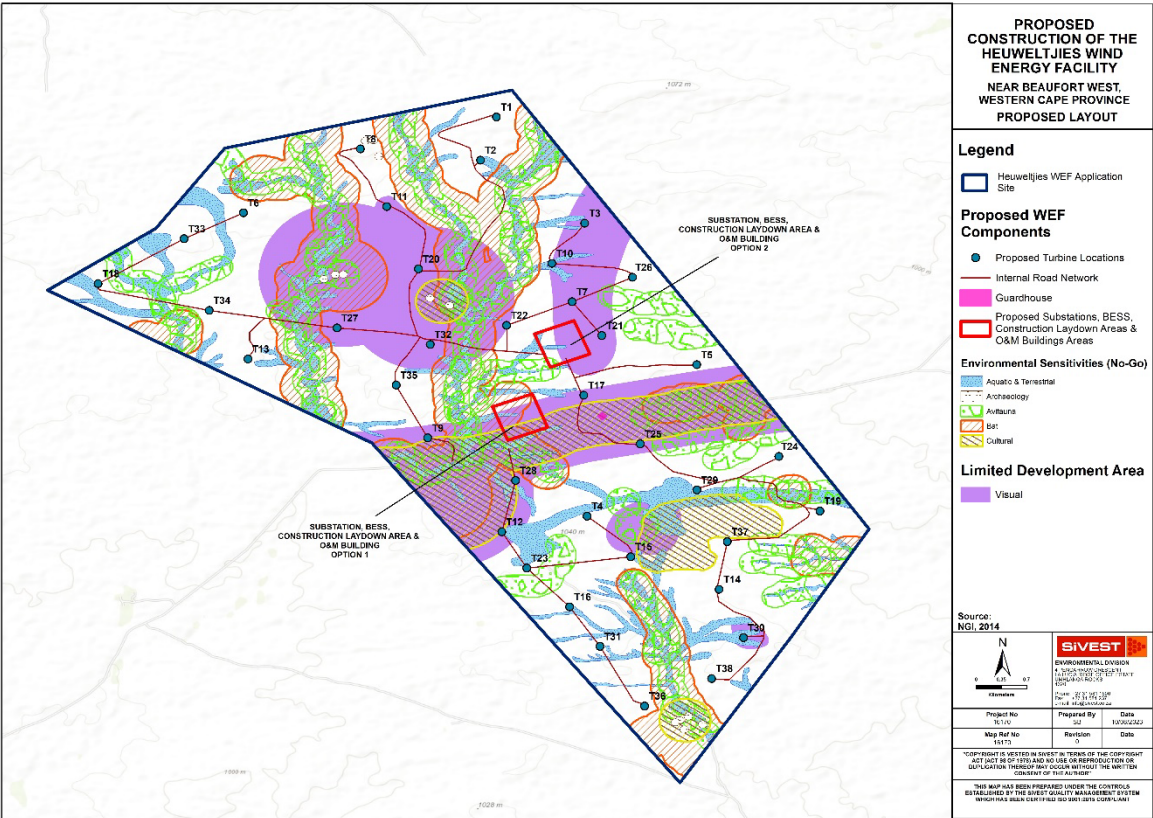


Figure 2: Environmental Sensitivity Overlay (Final)



Figure 3a: Map showing substation 1 location in relation to the Agriculture Theme Sensitivity (DFFE Screening Tool)



Figure 3b: Map showing substation 2 location in relation to the Agriculture Theme Sensitivity (DFFE Screening Tool)

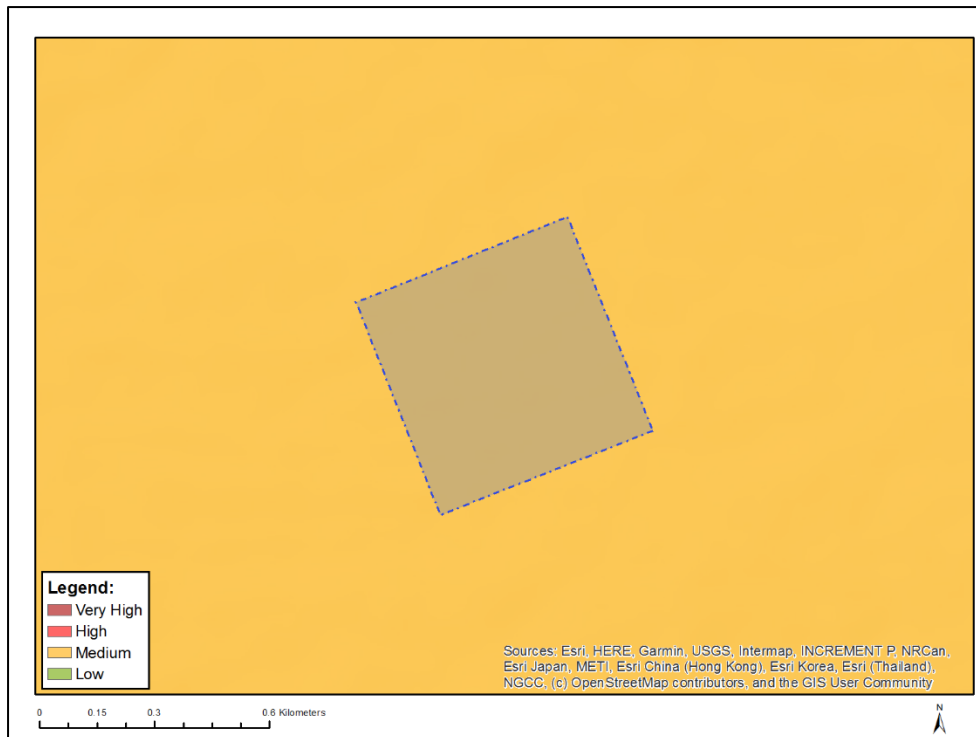


Figure 4a: Map showing substation 1 location in relation to the Animal Species Theme Sensitivity (DFFE Screening Tool)

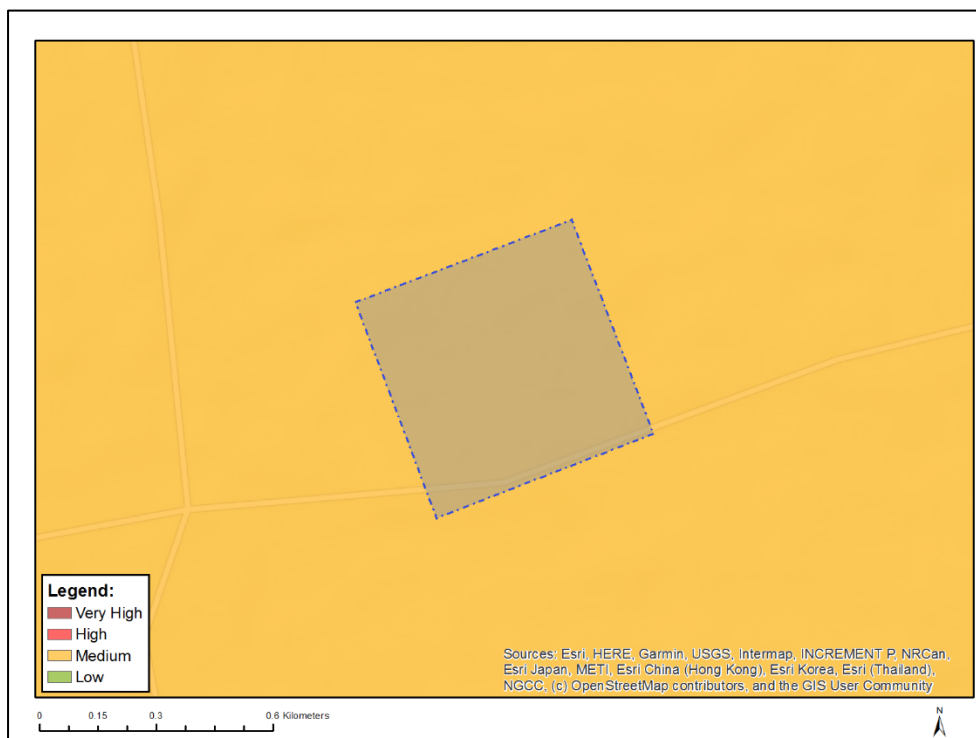


Figure 4b: Map showing substation 2 location in relation to the Animal Species Theme Sensitivity (DFFE Screening Tool)

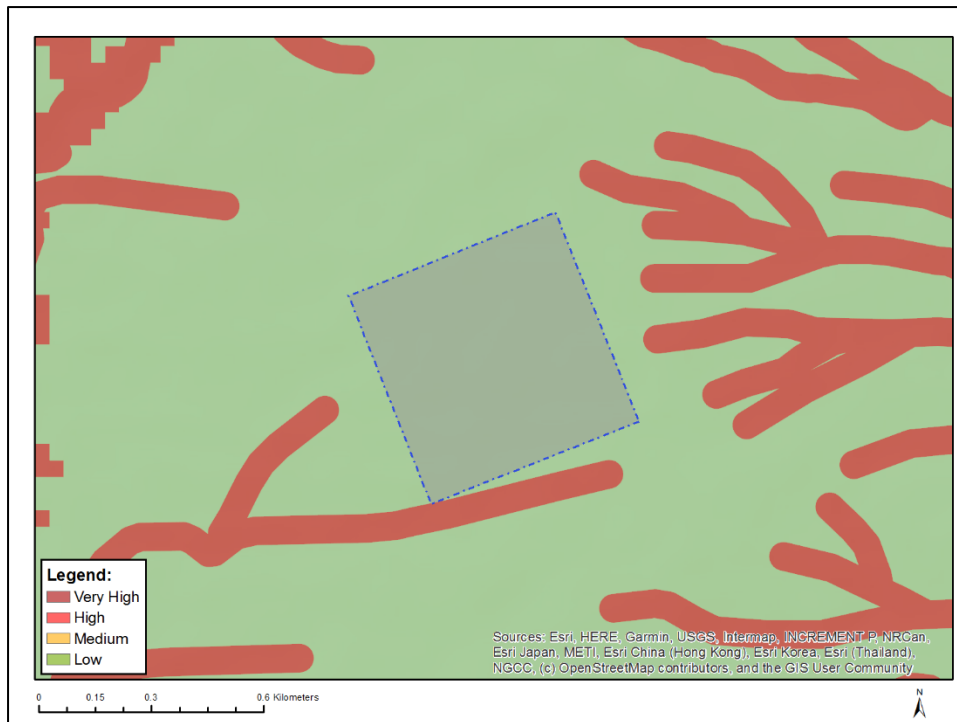


Figure 5a: Map showing substation 1 location in relation to the Aquatic Biodiversity Theme Sensitivity (DFFE Screening Tool)

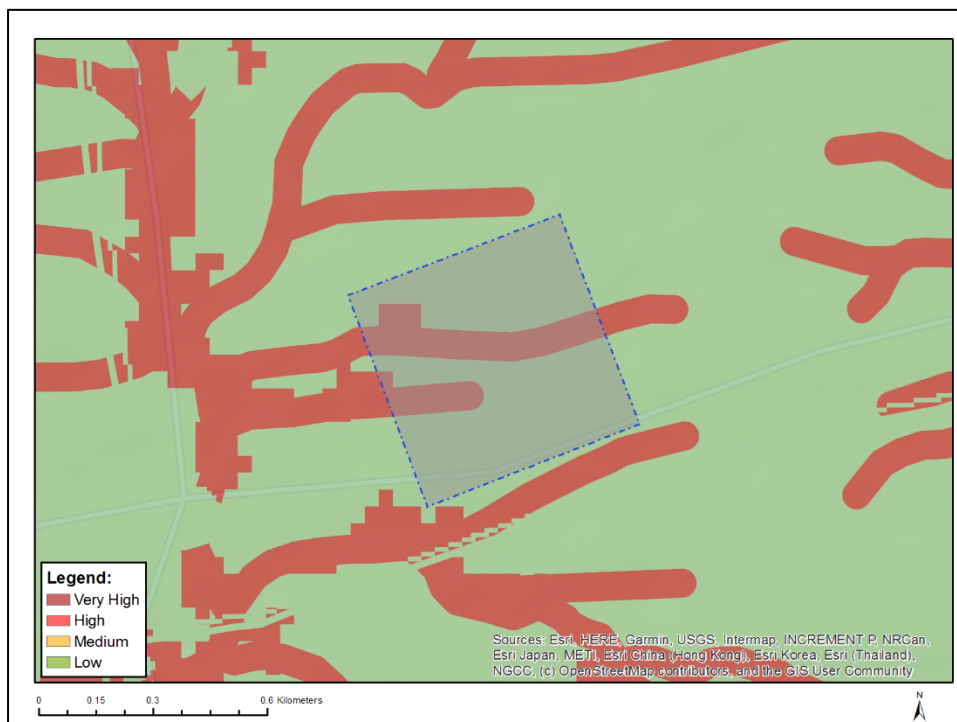


Figure 5b: Map showing substation 2 location in relation to the Aquatic Biodiversity Theme Sensitivity (DFFE Screening Tool)





Figure 6a: Map showing substation 1 location in relation to the Archaeological and Cultural Heritage Theme Sensitivity (DFFE Screening Tool)



Figure 6b: Map showing substation 2 location in relation to the Archaeological and Cultural Heritage Theme Sensitivity (DFFE Screening Tool)



Figure 7b: Map showing substation 2 location in relation to the Civil Aviation Theme Sensitivity (DFFE Screening Tool)



Figure 8a: Map showing substation 1 location in relation to the Defence Theme Sensitivity (DFFE Screening Tool)





Figure 8b: Map showing substation 2 location in relation to the Defence Theme Sensitivity (DFFE Screening Tool)

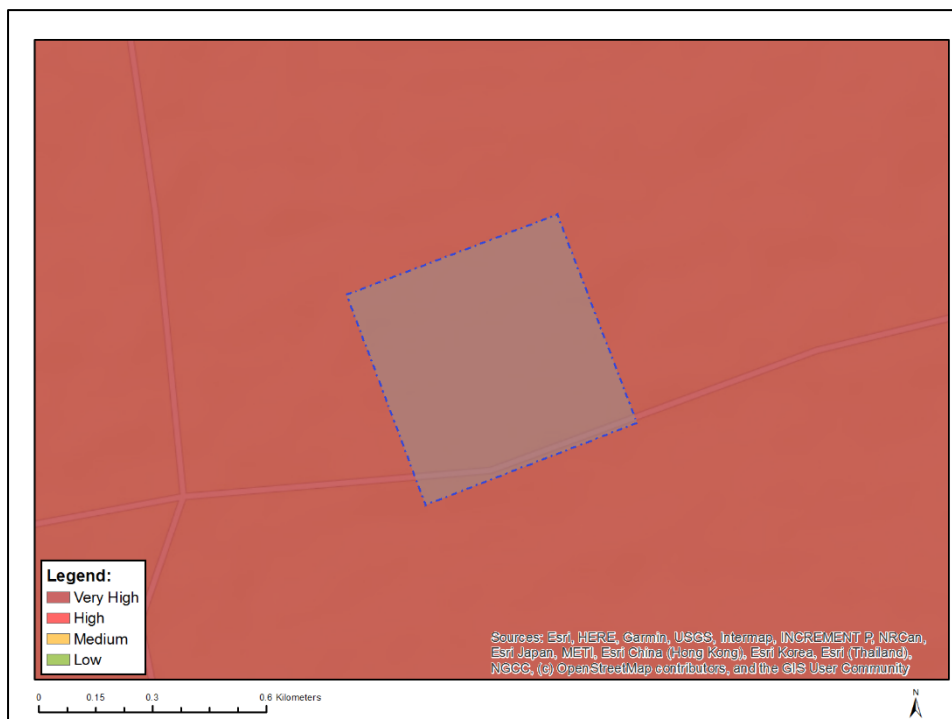


Figure 9b: Map showing substation 2 location in relation to the Palaeontology Theme Sensitivity (DFFE Screening Tool)

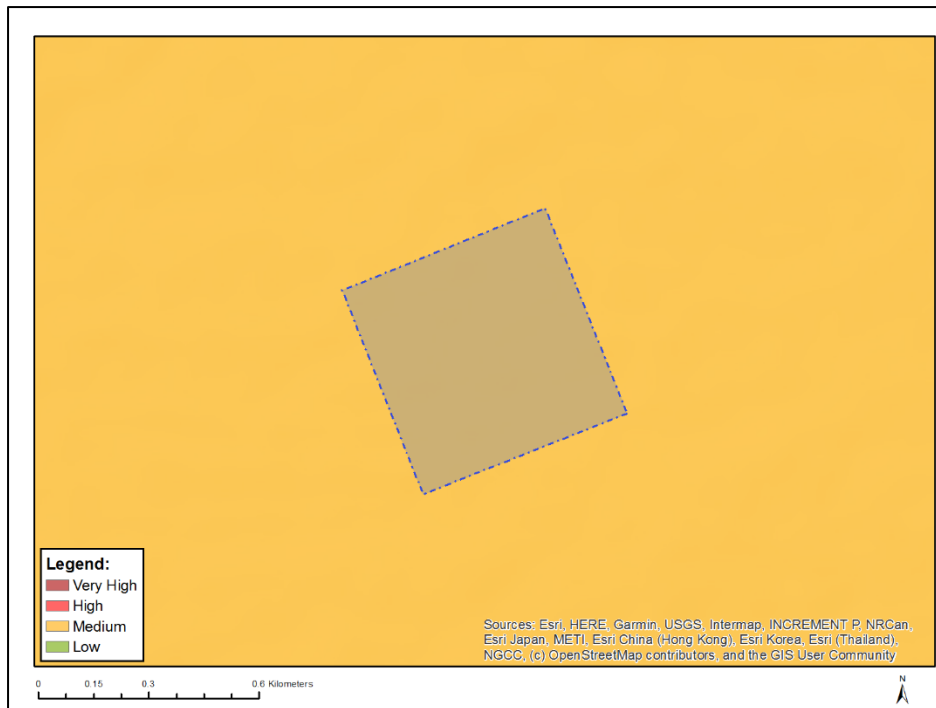


Figure 10a: Map showing substation 1 location in relation to the Plant Species Theme Sensitivity (DFFE Screening Tool)

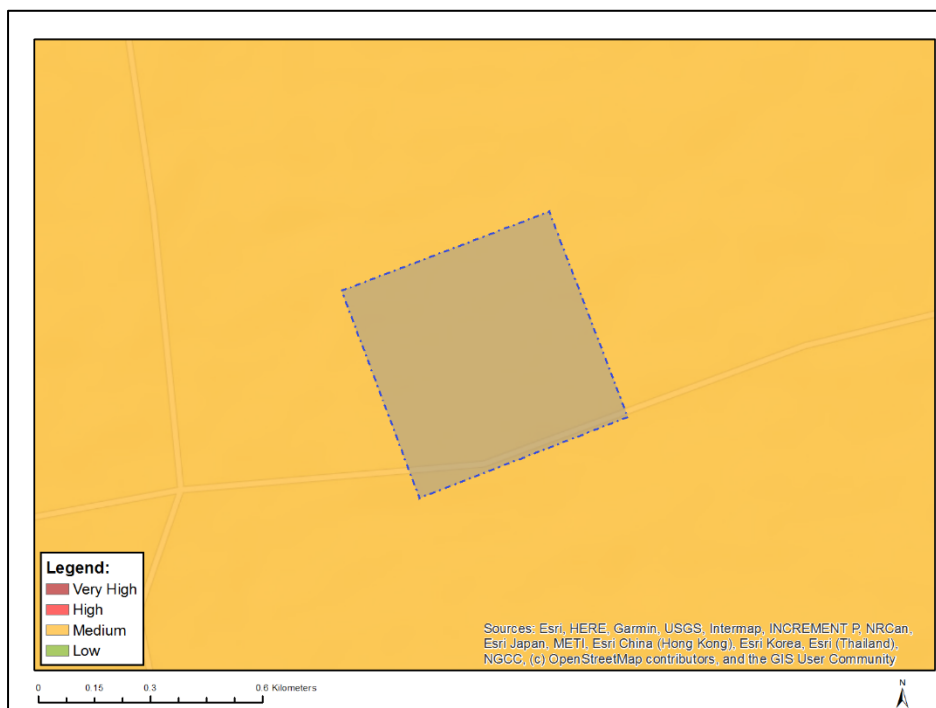


Figure 10b: Map showing substation 2 location in relation to the Plant Species Theme Sensitivity (DFFE Screening Tool)



Figure 11a: Map showing substation 1 location in relation to the Terrestrial Biodiversity Theme Sensitivity (DFFE Screening Tool)



Figure 11b: Map showing substation 2 location in relation to the Terrestrial Biodiversity Theme Sensitivity (DFFE 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:

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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.

## PART C

### 8 SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES

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

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

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

**The following specialist studies were undertaken as part of this project:**

- Agricultural and Soils Compliance Statement
- Avifauna Impact Assessment
- Bat Impact Assessment;
- Terrestrial Biodiversity Impact Assessment;
- Desktop Geotechnical Impact Assessment;
- Heritage Impact Assessment (including Palaeontology, Archaeology & Cultural Landscape);
- Noise Impact Assessment;
- Desktop Social Impact Assessment;
- Freshwater Impact Assessment;
- Transportation Impact Assessment; and
- Visual Impact Assessment.

**The mitigation measures provided by the Specialists through the Impact Assessment process are included below.**

**Agriculture and Soils:**

**Management plan for the planning and design phase (pre-construction phase)**

Impact	Mitigation/ Management objectives and outcomes	Mitigation /Management actions	Methodology	Monitoring Frequency	Responsibility
Aspect: Protection of soil resources					
Erosion	That disturbance and existence of hard surfaces causes no erosion on or downstream of the site.	1. Design an effective system of stormwater run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion. This is included in the stormwater management plan.	1. Ensure that the storm water run-off control is included in the engineering design.	1. Once-off during the design phase.	1. Holder of the EA

## Agriculture and Soils:

### Management plan for the construction phase

Impact	Mitigation /Management objectives and outcomes	Mitigation /Management actions	Monitoring		
			Methodology	Frequency	Responsibility
Aspect: Protection of soil resources					
Erosion	That disturbance and existence of hard surfaces causes no erosion on or downstream of the site.	1. Implement an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.	1. Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.	1. Every 2 months during the construction phase	1. Environmental Control Officer (ECO)
Erosion	That vegetation clearing does not pose a high	1. Maintain where possible all vegetation cover and	• Undertake a periodic site	• Every 4 months during the	• Environmental Control Officer

Impact	Mitigation /Management objectives and outcomes	Mitigation /Management actions	Monitoring		
			Methodology	Frequency	Responsibility
	erosion risk.	facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.	inspection to record the occurrence of and re-vegetation progress of all areas that require re-vegetation.	construction phase	(ECO)
Topsoil loss	That topsoil loss is minimised	1. If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.	<ul style="list-style-type: none"> <li>Record GPS positions of all occurrences of below-surface soil disturbance (e.g. excavations). Record the date of topsoil stripping and replacement. Check that topsoil covers the entire disturbed area.</li> </ul>	<ul style="list-style-type: none"> <li>As required, whenever areas are disturbed.</li> </ul>	<ul style="list-style-type: none"> <li>Environmental Control Officer (ECO)</li> </ul>



## Agriculture and Soils:

### Management plan for the operational phase

Impact	Mitigation/Management objectives and outcomes	Mitigation / Management actions	Methodology	Monitoring Frequency	Responsibility
Aspect: Protection of soil resources					
Erosion	That existence of hard surfaces causes no erosion on or downstream of the site.	1. Maintain the storm water run-off control system. Monitor erosion and remedy the storm water control system in the event of any erosion occurring.	• Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.	• Bi-annually	• Facility Environmental Manager
Erosion	That denuded areas are re-vegetated to stabilise	1. Facilitate re-vegetation of denuded areas	• Undertake a periodic site	• Bi-annually	• Facility Environmental

Impact	Mitigation/Management objectives and outcomes	Mitigation / Management actions	Monitoring		
			Methodology	Frequency	Responsibility
	soil against erosion	throughout the site	inspection to record the progress of all areas that require re-vegetation.		Manager

### Agriculture and Soils:

#### Management plan for the decommissioning phase

Impact	Mitigation/Management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
Aspect: Protection of soil resources					
Erosion	That disturbance and existence of hard surfaces causes no erosion on or downstream of the site.	1. Implement an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and	• Undertake a periodic site inspection to verify and inspect the effectiveness and integrity of the storm water run-off control system and to specifically record the occurrence of any	• Every 2 months during the decommissioning phase, and then every 6 months after completion of decommissioning, until final	• Environmental Control Officer (ECO)

Impact	Mitigation/Management objectives and outcomes	Mitigation / management actions	Monitoring		
			Methodology	Frequency	Responsibility
		it must prevent any potential down slope erosion.	erosion on site or downstream. Corrective action must be implemented to the run-off control system in the event of any erosion occurring.	sign-off is achieved.	
Erosion	That vegetation clearing does not pose a high erosion risk.	1. Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion.	<ul style="list-style-type: none"> <li>Undertake a periodic site inspection to record the occurrence of and re-vegetation progress of all areas that require re-vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>Every 4 months during the decommissioning phase, and then every 6 months after completion of decommissioning, until final sign-off is achieved.</li> </ul>	<ul style="list-style-type: none"> <li>Environmental Control Officer (ECO)</li> </ul>
Topsoil loss	That topsoil loss is minimised	1. If an activity will mechanically disturb the soil below surface in any way, then any available	<ul style="list-style-type: none"> <li>Record GPS positions of all occurrences of below-surface soil</li> </ul>	<ul style="list-style-type: none"> <li>As required, whenever areas are disturbed.</li> </ul>	<ul style="list-style-type: none"> <li>Environmental Control Officer (ECO)</li> </ul>

Impact	Mitigation/Management objectives and outcomes	Mitigation / management actions	<i>Methodology</i>	Monitoring <i>Frequency</i>	<i>Responsibility</i>
		topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface.	disturbance (e.g. excavations). Record the date of topsoil stripping and replacement. Check that topsoil covers the entire disturbed area.		

**Avifauna:**

**Management Plan for the Pre-Construction Phase**

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
Avifauna: Mortality due to collisions with the turbines					
Mortality of priority avifauna due to collisions with the wind turbines	Prevent mortality of priority avifauna	1. The results of the pre-construction monitoring must guide the lay-out of the turbines, especially as far as proposed no-turbine zones are concerned. No turbines must be constructed in the buffer zones which were identified based on the results of the pre-construction monitoring, with a specific view to limiting the risk of collisions to a variety of birds, including several Red Data species.	<ul style="list-style-type: none"><li>• Design the facility with 200m buffers around dams and water troughs, and 150m buffers around major drainage lines.</li><li>• A 250m circular No-Go (no turbines) buffer zone must be implemented around the Great Kestrel nest at the Heuweltjies application site</li></ul>	<ul style="list-style-type: none"><li>• Once-off during the planning phase.</li></ul>	<ul style="list-style-type: none"><li>• Project Developer</li></ul>

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
			<ul style="list-style-type: none"> <li>Implement a 5km no-turbine zone around the Martial Eagle nest on Tower 162 of the Droërivier Proteus 1 400kV HV line.</li> </ul>		
<b>Avifauna: Mortality due to electrocution</b>					
Electrocution of raptors on the internal 11-33kV poles	Prevent electrocutions	<ol style="list-style-type: none"> <li>Use underground cabling as much as is practically possible.</li> <li>Where the use of overhead lines is unavoidable due to technical reasons, the Avifaunal Specialist must be consulted to ensure that a raptor friendly pole design is used, and that appropriate mitigation is implemented pro-actively for complicated pole structures e.g. insulation of live</li> </ol>	<ul style="list-style-type: none"> <li>Design the facility with underground cabling.</li> <li>Consult with Avifaunal Specialist during the design phase of the overhead lines.</li> </ul>	<ul style="list-style-type: none"> <li>Once-off during the planning phase.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer</li> </ul>

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		components to prevent electrocutions on terminal structures and pole transformers.			

### Avifauna:

### Management Plan for the Construction Phase

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
Avifauna: Displacement due to disturbance					
The noise and movement associated with the construction activities at the development footprint will be a source of disturbance which would lead to the displacement of avifauna from the area	Prevent unnecessary displacement of priority avifauna by ensuring that contractors are aware of the requirements of the Construction Environmental Management Programme (CEMPr.)	A site-specific CEMPr must be implemented, which gives appropriate and detailed description of how construction activities must be conducted. All contractors are to adhere to the CEMPr and should apply good environmental practice during construction. The CEMPr must specifically include the following:  1. No off-road driving. 2. Maximum use of existing roads.	<ul style="list-style-type: none"><li>• Implementation of the CEMPr. Oversee activities to ensure that the CEMPr is implemented and enforced via site audits and inspections. Report and record any non-compliance.</li><li>• Ensure that construction personnel are made aware of the impacts relating to off-road driving.</li></ul>	<ul style="list-style-type: none"><li>• Daily</li><li>• Monthly</li><li>• Monthly</li><li>• Monthly</li><li>• Monthly</li></ul>	<ul style="list-style-type: none"><li>• Contractor and ECO</li></ul>

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		3. Measures to control noise and dust according to latest best practice. 4. Restricted access to the rest of the property. 5. Strict application of all recommendations in the botanical specialist report pertaining to the limitation and rehabilitation of the footprint.	<ul style="list-style-type: none"> <li>Construction access roads must be demarcated clearly. Undertake site inspections to verify.</li> <li>Monitor the implementation of noise control mechanisms via site inspections and record and report non-compliance.</li> <li>Ensure that the construction area is demarcated clearly and that construction personnel are made aware of these demarcations. Monitor via site inspections and report non-compliance.</li> </ul>		
<b>Avifauna: Displacement due to habitat transformation</b>					



Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
Total or partial displacement of avifauna due to habitat transformation associated with the vegetation clearance and the presence of the wind turbines and associated infrastructure.	Prevent unnecessary displacement of avifauna by ensuring that the rehabilitation of transformed areas is implemented by an appropriately qualified rehabilitation specialist, according to the recommendations of the botanical specialist study.	<ol style="list-style-type: none"> <li>1. Implement rehabilitation of vegetation</li> <li>2. Monitor rehabilitation via site audits and site inspections to ensure compliance. Record and report any non-compliance.</li> <li>3. Vehicle and pedestrian access to the site should be controlled and restricted to the facility footprint as much as possible to prevent unnecessary destruction of vegetation.</li> </ol>	<ul style="list-style-type: none"> <li>• Appointment of rehabilitation specialist to oversee the habitat rehabilitation.</li> <li>• Site inspections to monitor progress of rehabilitation.</li> </ul>	<ul style="list-style-type: none"> <li>• Once-off</li> <li>• Once a year</li> </ul>	<ul style="list-style-type: none"> <li>• Operations Manager</li> <li>• SHE Manager</li> <li>• SHE Manager</li> <li>• Operations Manager</li> </ul>

#### Avifauna:

#### Management Plan for the Operational Phase

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
Avifauna: Mortality due to collisions with the wind turbines					

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
Bird collisions with the wind turbines	Prevention of the collision mortality on wind turbines.	1. Formal live-bird monitoring and carcass searches should be implemented at the start of the operational phase, as per the most recent edition of the Best Practice Guidelines at the time (Jenkins <i>et al.</i> 2015) to assess collision rates. The exact time when operational monitoring should commence, will depend on the construction schedule, and should commence when the first turbines start operating. The Best Practice Guidelines require that, as an absolute minimum, operational monitoring should be undertaken for the first two (preferably three)	<ul style="list-style-type: none"> <li>• Comply with attached operational monitoring plan, including live bird monitoring and carcass searches.</li> <li>• Implement operational monitoring plan.</li> <li>• Design and implement mitigation measures if mortality thresholds are exceeded.</li> <li>• Compile quarterly and annual progress reports detailing the results of the operational monitoring and progress with any recommended mitigation measures.</li> </ul>	<ul style="list-style-type: none"> <li>• Once-off</li> <li>• Years 1,2, 5 and every five years after that for the duration of the operational lifetime of the facility.</li> </ul>	<ul style="list-style-type: none"> <li>• Operations Manager</li> </ul>

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>years of operation, and then repeated again in year 5, and again every five years thereafter for the operational lifetime of the facility.</p> <p>2. If estimated annual collision rates indicate unacceptable mortality levels of priority species, i.e if it exceeds mortality thresholds as determined by the avifaunal specialist in consultation with BLSA and other avifaunal specialists, additional measures will have to be implemented which could include shut down on demand or other proven measures.</p>			
<b>Avifauna: Mortality due to collisions and electrocutions on the 11-33kV network</b>					
Bird electrocutions on the overhead	Prevention of electrocution mortality on the overhead sections of	1. Where overhead 11-33kV lines are required, conduct regular inspections	<ul style="list-style-type: none"> <li>Carcass searchers under the supervision of</li> </ul>	<ul style="list-style-type: none"> <li>At least once every two months.</li> </ul>	<ul style="list-style-type: none"> <li>Operations Manager</li> </ul>

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
sections of the internal 11-33kV cables	the 11-33kV internal cable network.	of the overhead sections of the internal reticulation	the Avifaunal Specialist. <ul style="list-style-type: none"> <li>• Design and implement mitigation measures if mortality thresholds are exceeded.</li> <li>• Compile quarterly and annual progress reports detailing the results of the operational monitoring and progress with any recommended mitigation measures</li> </ul>		

**Avifauna:**

**Management Plan for the Decommissioning Phase**

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
Avifauna: Displacement due to disturbance associated with the dismantling activities					
The noise and movement associated with the de-commissioning activities at the WEF footprint will be a source of disturbance which would lead to the displacement of avifauna from the area	Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the EMPr.	<p>A site-specific EMPr must be implemented, which gives appropriate and detailed description of how construction activities must be conducted. All contractors are to adhere to the EMPr and should apply good environmental practice during construction. The EMPr must specifically include the following:</p> <ol style="list-style-type: none"><li>1. No off-road driving.</li><li>2. Maximum use of existing roads.</li><li>3. Measures to control noise and dust according to latest best practice.</li><li>4. Restricted access to the rest of the property.</li><li>5. Strict application of all recommendations in the botanical specialist report pertaining to the</li></ol>	<ul style="list-style-type: none"><li>• Implementation of the EMPr. Oversee activities to ensure that the EMPr is implemented and enforced via site audits and inspections. Report and record any non-compliance.</li><li>• Ensure that construction personnel are made aware of the impacts relating to off-road driving.</li><li>• Access roads must be demarcated clearly. Undertake site inspections to verify.</li><li>• Monitor the implementation of noise control mechanisms via site inspections and</li></ul>	<ul style="list-style-type: none"><li>• On a daily basis</li><li>• Weekly</li><li>• Weekly</li><li>• Weekly</li></ul>	<ul style="list-style-type: none"><li>• Contractor and ECO</li></ul>

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		limitation of the footprint.	record and report non-compliance. <ul style="list-style-type: none"> <li>Ensure that the footprint area is demarcated and that construction personnel are made aware of these demarcations. Monitor via site inspections and report non-compliance.</li> </ul>		

**Bat:**

**Management Plan for the Construction Phase**

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
The destruction of active bat roost and features that could serve as bat roosts, such as rock formations and the removal of trees on site, destruction of derelict	<ul style="list-style-type: none"> <li>Mitigate disturbance due to construction activities.</li> </ul>	1. Apart from associated infrastructure, construction activities to be kept out of all high bat sensitive areas as far as possible.	<ul style="list-style-type: none"> <li>Monitor the efficiency of the EMPR.</li> <li>Monitor whether proposed measures are adhered to.</li> </ul>	<ul style="list-style-type: none"> <li>During construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>Project Developer</li> <li>Bat specialist and ECO.</li> </ul>

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
holes and fragmentation of habitat.		<ol style="list-style-type: none"> <li>2. Rock formations should be avoided during construction as far as possible.</li> <li>3. Destruction of trees should be avoided as far as possible and in cases where trees have to be destroyed, care should be taken not to destroy bat roosts.</li> <li>4. Care should be taken if any dense bushes are destroyed so that no roosts are disturbed or destroyed.</li> <li>5. Aardvark holes or any large derelict holes or excavations should not be destroyed before careful examination for bats.</li> <li>6. The Environmental Control Officer (ECO), or a responsible appointed person or site manager, should contact a bat</li> </ol>	<ul style="list-style-type: none"> <li>• ECO should be trained to recognize bat species and roost locations before construction starts.</li> </ul>		

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		specialist before construction commences so that they know what to look out for during construction.			
Creating new habitat amongst the turbines which might attract bats. This includes buildings with roofs that could serve as roosting space or open water sources from quarries or excavation where water could accumulate.	Creating features which attract bats	<ol style="list-style-type: none"> <li>1. Completely seal off roofs of new buildings (e.g., substations and site buildings). Note, a small bat species could enter a hole the size of 1 cm<sup>2</sup>.</li> <li>2. Roofs need to be regularly inspected during the lifetime of the WEF, and any new holes need to be sealed.</li> <li>3. Excavation areas, quarries or any other artificial depressions should be filled and rehabilitated to avoid creating new areas of open water sources which could attract bats during rainy spells.</li> </ol>	<ul style="list-style-type: none"> <li>• Visual inspection and continuous monitoring of high sensitivity areas, erosion prevention, chemical pollution and vehicle activity to prevent habitat destruction.</li> <li>• If buildings, trees or structures providing potential roosts need to be demolished, the ECO is required to investigate the features before commencement of the works.</li> </ul>	<ul style="list-style-type: none"> <li>• Throughout construction</li> <li>• ECO to be present during all site clearance activities</li> <li>• Access to bat specialist if ECO needs information or confirmation concerning bat presence</li> </ul>	<ul style="list-style-type: none"> <li>• Project Developer.</li> <li>• Holder of EA to appoint ECO.</li> <li>• Appointed bat specialist to train the ECO, if necessary.</li> </ul>



Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
Construction noise, especially at night as well as light disturbance	Mitigate disturbance due to construction activities	<ol style="list-style-type: none"> <li>1. Nightly construction activities should be avoided, or if necessary, minimised to the shortest period possible.</li> <li>2. Except for compulsory civil aviation lighting, artificial lighting during construction should be minimised, especially bright lights or spotlights.</li> <li>3. Apart from avian lighting specifications, lights should avoid skyward illumination.</li> <li>4. Turbine tower lights should be switched off when not in operation, where possible.</li> </ol>	<ul style="list-style-type: none"> <li>• Monitor the efficiency of the EMPR.</li> <li>• Monitor whether proposed measures are adhered to.</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• During construction phase.</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Project Developer</li> <li>• Bat specialist and ECO.</li> </ul>

#### **Bat:**

#### **Management Plan for the operation Phase**

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
Fatality through direct collision or barotrauma of resident bats occupying the	Mitigate disturbance due to operation activities.	1. All turbines and turbine components, including the rotor swept zone, should be kept out of all 'no-go' and high sensitivity zones.	<ul style="list-style-type: none"> <li>• Regular bat monitoring reports, informed by the relevant SABAA</li> </ul>	Throughout operation and during operational bat monitoring period.	Site manager, Project developer

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
airspace amongst the turbines. The turning blades of the turbines during operation are the most important aspect of the project that would impact negatively on bats. High flying (high risk) species have predominantly been confirmed at the proposed Heuvelthies WEF site.		<ol style="list-style-type: none"> <li>Mitigation, as proposed, should be applied as soon as the test period of turbines are completed, and turbines start turning.</li> <li>A bat specialist should be appointed <b>before</b> the turbines start to turn, and operational bat monitoring should start when all the turbines start to turn, for a minimum of two years, or described by the latest South African bat guidelines.</li> <li>At least two years of post-construction bat monitoring is to be conducted and must be performed according to the South Africa Good Practice Guidelines for Operational Monitoring for Bats at Wind Energy facilities (Aronson, et.al., 2020), or later versions of the guidelines valid at the time of monitoring, as well as other relevant SABAA guidelines as applicable during the monitoring period.</li> <li>Prolonged post-construction mitigation, beyond the</li> </ol>	<p>operational bat monitoring guidelines.</p> <ul style="list-style-type: none"> <li>Adhere to the mitigation measures as indicated by the EA and Section 9 of the Bat Monitoring report.</li> <li>Maintain a register of bat mortality/injury.</li> <li>Regular communication between bat specialist and site manager.</li> </ul>		

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>prescribed two years, might be necessary if advised by the operational bat specialist.</p> <p>6. Mitigation should be discussed between the bat specialist and developer during the operational phase and should be adapted and implemented without delay. Where high bat mortality occurs, turbine specific mitigation measures should be applied, using Section 9 as a starting point for discussions.</p> <p>7. Freewheeling, when turbines do not generate power, should be avoided, to a point where the turbines are not a threat to bats.</p> <p>8. Except for compulsory lighting required in terms of civil aviation, artificial lighting should be minimised, especially bright lights. Lights should rather be turned downwards. Turbine tower lights should be switched off when not in operation, if possible.</p> <p>9. It is understood that static bat monitoring equipment on</p>			

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		turbines has a cost implication. Although it is not a requirement at this stage, as it depends on whether the Met mast will be deployed for the life span of the turbines. Having refined static data from sampling points at height, would aid in interpreting future bat fatality records of the proposed Heuveljies WEF. Therefore, the installation of more than one monitoring system at height, is important.			
Bat fatality during migration. Limited activity by <i>Miniopterus natalensis</i> , a Near Threatened migration species, have been recorded. Not much research has been conducted on migration of bats in South Africa, and some of the	<ul style="list-style-type: none"> <li>Mitigate potential impacts on bats during operation of wind farm.</li> <li>Reduce bat mortality during the operational lifetime of the wind farm.</li> <li>Supervise all bat monitoring activities.</li> </ul>	<ol style="list-style-type: none"> <li>Care should be taken during post construction monitoring to verify the activity of <i>M. natalensis</i>, especially within the rotor swept area of the turbine blades. Carcasses should be identified so as to establish the fatality of this species.</li> <li>A bat specialist should be appointed before the turbines start to turn, and operational bat monitoring should start when all the turbines start to turn, for a minimum of two</li> </ol>	<ul style="list-style-type: none"> <li>Regular bat monitoring reports, informed by the relevant SABAA operational bat monitoring guidelines.</li> <li>Adhere to the mitigation measures as indicated by the EA and Section 9 of the Bat Monitoring report.</li> <li>Maintain a register of bat mortality/injury.</li> </ul>	Throughout operation and during operational bat monitoring period.	Site manager, Project developer

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
other species occurring on site could also migrate.		<p>years, or described by the latest South African bat guidelines.</p> <p>3. At least two years of post-construction bat monitoring is to be conducted and must be performed according to the South Africa Good Practice Guidelines for Operational Monitoring for Bats at Wind Energy facilities (Aronson, et.al., 2020), or later versions of the guidelines valid at the time of monitoring, as well as other relevant SABAA guidelines as applicable during the monitoring period.</p> <p>4. Prolonged post-construction mitigation, beyond the prescribed two years, might be necessary if advised by the operational bat specialist.</p> <p>5. Mitigation should be discussed between the bat specialist and developer during the operational phase and should be adapted and implemented without delay. Where high bat mortality occurs, of turbine specific mitigation measures</p>	<ul style="list-style-type: none"> <li>Regular communication between bat specialist and site manager</li> </ul>		

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>should be applied, using Section 9 as a starting point for discussions.</p> <p>6. Freewheeling, when turbines do not generate power, should be avoided, to a point where the turbines are not a threat to bats.</p> <p>7. Except for compulsory lighting required in terms of civil aviation, artificial lighting should be minimised, especially bright lights. Lights should rather be turned downwards. Turbine tower lights should be switched off when not in operation, if possible.</p> <p>8. It is understood that static bat monitoring equipment on turbines has a cost implication. Although it is not a requirement at this stage, as it depends on whether the Met mast will be deployed for the life span of the turbines. Having refined static data from sampling points at height, would aid in interpreting future bat fatality records of the proposed Heuweltjies WEF.</p>			

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		Therefore, the installation of more than one monitoring system at height, is important.			
Loss of bats of conservation value: Bat fatality of bat species of conservation value. Calls similar to the red data <i>Miniopterus natalensis</i> have been recorded, as well as the endemic <i>Eptesicus hottentotus</i> .	Mitigate potential impacts on bats during operation of wind farm.	<ol style="list-style-type: none"> <li>1. Care should be taken during post construction monitoring to verify the activity of bat species of conservation value, especially within the rotor sweep area of the turbine blades.</li> <li>2. Proven species-specific mitigation measures, such as curtailment or bat deterrents, should be timeously applied if high activity or high numbers of carcasses of bats of conservation value is recorded during post-construction.</li> <li>3. Bat carcasses should be identified to establish whether there are bats species' carcasses of conservation value.</li> <li>4. A bat specialist should be appointed before the turbines start to turn, and operational bat monitoring should start when all the turbines start to turn, for a minimum of two years,</li> </ol>	Adhere to the mitigation measures as indicated by the EA and Section 9 of the Bat Monitoring report.	Throughout operation and during operational bat monitoring period.	Site manager, Project developer

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>or described by the latest South African bat guidelines.</p> <p>5. At least two years of post-construction bat monitoring is to be conducted and must be performed according to the South Africa Good Practice Guidelines for Operational Monitoring for Bats at Wind Energy facilities (Aronson, et.al., 2020), or later versions of the guidelines valid at the time of monitoring, as well as other relevant SABAA guidelines as applicable during the monitoring period.</p> <p>6. Prolonged post-construction mitigation, beyond the prescribed two years, might be necessary if high numbers of bats of conservation value are recorded, as advised by the operational bat specialist.</p> <p>7. Mitigation should be discussed between the bat specialist and developer during the operational phase and should be adapted and implemented without delay. Where high</p>			



Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>fatality of bats of conservation value occurs, turbine specific mitigation measures should be applied, using Section 9 as a starting point for discussions.</p> <p>8. Freewheeling, when turbines do not generate power, should be avoided, to a point where the turbines are not a threat to bats.</p> <p>9. Except for compulsory lighting required in terms of civil aviation, artificial lighting should be minimised, especially bright lights. Lights should rather be turned downwards. Turbine tower lights should be switched off when not in operation, if possible.</p> <p>10. It is understood that static bat monitoring equipment on turbines has a cost implication. Although it is not a requirement at this stage, as it depends on whether the Met mast will be deployed for the life span of the turbines. Having refined static data from sampling points at height, would aid in interpreting future bat fatality records of the</p>			

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		proposed Heuveltjies WEF. Therefore, the installation of more than one monitoring system at height, is important.			
Bat fatality due to the attraction of bats to turbine blades.	Avoid activities that will attract bats to turbines.	1. Except for compulsory lighting required in terms of civil aviation, artificial lighting should be minimised, especially bright lights. Lights should rather be turned downwards. Turbine tower lights should be switched off when not in operation, if possible.	Reduce lights as far as possible.	Ongoing	Site manager/Project Developer
Loss of habitat and foraging space during operation of the wind turbines.	<ul style="list-style-type: none"> <li>Mitigate the loss of habitat and foraging space to avoid bat mortality.</li> <li>Reduce bat mortality during the operational lifetime of the wind farm.</li> </ul>	<ol style="list-style-type: none"> <li>All turbines and turbine components, including the rotor swept zone, should be kept out of all 'no-go' and high sensitivity zones.</li> <li>At least two years of post-construction bat monitoring is to be conducted and must be performed according to the South Africa Good Practice Guidelines for Operational Monitoring for Bats at Wind Energy facilities (Aronson, et.al., 2020), or later versions of the guidelines valid at the time of monitoring, as well as other</li> </ol>	Adaptive mitigation plan.	During operations.	Site manager/Project Developer and ECO

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>relevant SABAA guidelines as applicable during the monitoring period. Mitigation, as proposed for medium sensitivity zones proposed, should be applied after testing, as soon as turbines start to turn.</p> <p>3. Prolonged post-construction mitigation, beyond the prescribed two years, might be necessary if advised by the operational bat specialist.</p> <p>4. Mitigation should be discussed between the bat specialist and developer during the operational phase and should be adapted and implemented without delay. Where high bat mortality occurs, turbine specific mitigation measures should be applied, using Section 9 as a starting point for discussions.</p> <p>5. Freewheeling, when turbines do not generate power, should be avoided, to a point where the turbines are not a threat to bats.</p>			

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>6. Except for compulsory lighting required in terms of civil aviation, artificial lighting should be minimised, especially bright lights. Lights should rather be turned downwards. Turbine tower lights should be switched off when not in operation, if possible.</p> <p>7. It is understood that static bat monitoring equipment on turbines has a cost implication. Although it is not a requirement at this stage, as it depends on whether the Met mast will be deployed for the life span of the turbines. Having refined static data from sampling points at height, would aid in interpreting future bat fatality records of the proposed Heuweltjies WEF. Therefore, the installation of more than one monitoring system at height, is important.</p>			
Reduction in size, genetic diversity, resilience, and	Monitor potential impacts on bats	1. A bat specialist should be appointed before the turbines start to turn, and operational	Adaptive mitigation plan.	During operations.	Project Developer/Site manager and ECO.

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
persistence of bat populations.	during operation of wind farm. Prevent activities that will attract bats to high-risk areas on site.	<p>bat monitoring should start when all the turbines start to turn, for a minimum of two years, or described by the latest South African bat guidelines.</p> <p>2. At least two years of post-construction bat monitoring is to be conducted and must be performed according to the South Africa Good Practice Guidelines for Operational Monitoring for Bats at Wind Energy facilities (Aronson, et.al., 2020), or later versions of the guidelines valid at the time of monitoring, as well as other relevant SABAA guidelines as applicable during the monitoring period.</p> <p>3. Prolonged post-construction mitigation, beyond the prescribed two years, might be necessary if advised by the operational bat specialist.</p> <p>4. Mitigation should be discussed between the bat specialist and developer during the operational phase and should be adapted and implemented</p>			

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		<p>without delay. Where high bat mortality occurs, turbine specific mitigation measures should be applied, using Section 9 as a starting point for discussions.</p> <p>5. Freewheeling, when turbines do not generate power, should be avoided, to a point where the turbines are not a threat to bats.</p> <p>6. Except for compulsory lighting required in terms of civil aviation, artificial lighting should be minimised, especially bright lights. Lights should rather be turned downwards. Turbine tower lights should be switched off when not in operation, if possible.</p> <p>7. It is understood that static bat monitoring equipment on turbines has a cost implication. Although it is not a requirement at this stage, as it depends on whether the Met mast will be deployed for the life span of the turbines. Having refined static data from sampling points at height, would aid in interpreting future bat fatality records of the</p>			

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
		proposed Heuveltjies WEF. Therefore, the installation of more than one monitoring system at height, is important.			

### **Bat:**

### **Management Plan for the decommissioning Phase**

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	Frequency	Responsibility
DECOMMISSIONING PHASE					
Removal of turbines Bat disturbance due to decommissioning activities and associated noise, especially during night-time.	Mitigate disturbance due to decommissioning activities.	1. Except for compulsory lighting required in terms of civil aviation, artificial lighting during construction should be minimised, especially bright lights or spotlights. 2. Lights should avoid skyward illumination. 3. Night-time decommissioning activities should be avoided as far as possible.	Implement a decommissioning and rehabilitation plan to reduce the development footprint.	During decommissioning phase.	Site manager/ECO

## **Biodiversity**

### **Pre-construction Phase Specific Mitigations:**

A pre-construction walkthrough by the ecologist is recommended, who can assist with the development of the Rehabilitation and Monitoring plan, coupled to micro-siting of the final layout.

## **Biodiversity**

### **Construction Phase Specific Mitigations:**

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
<b>Loss of species of special concern:</b>  The construction activities will result in the disturbance of both aquatic and terrestrial habitats that may contain listed and or protected plant or animal species. However, none of these were observed during this assessment within the tower positions proposed	<ol style="list-style-type: none"><li>1. Develop and implement an Rehabilitation and Monitoring plan post Environmental Authorisation. This plan should include relocation of suitable plant species, but more important protect any topsoil stores and promote the collection of vegetative material and propagules / seed to assist with the revegetation of the site</li><li>2. Rapid regeneration of plant cover must be encouraged by setting aside topsoil during earthmoving and replacing onto areas where the re- establishment of plant cover is desirable to prevent erosion.</li></ol>	Holder of the EA ECO/specialist	Construction Monitoring and audit reports	Impacts avoided or managed as per specialist recommendations.  Plant Rehabilitation and Monitoring Plan developed and implemented  Ensure the conditions of the EA are adhered to.	Throughout construction



ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
<b>Loss of terrestrial habitats – flora and vegetation:</b> The construction of the proposed infrastructure will require the need to clear vegetation which could then have a secondary impact on ecological connectivity and especially Critical Biodiversity Areas, linked to the large riverine corridors.	<ol style="list-style-type: none"> <li>1. All alien plant re-growth, which is currently low within the greater region must be monitored and should it occur, these plants must be eradicated within the project footprints.</li> <li>2. Rapid regeneration of plant cover must be encouraged by setting aside topsoil during earthmoving and replacing onto areas where the re- establishment of plant cover is desirable to prevent erosion.</li> </ol>	Holder of the EA ECO/specialist	Construction Monitoring and audit reports	Impacts avoided or managed as per specialist recommendations.  Rehabilitation and Monitoring plan developed and implemented.  Ensure the conditions of the EA are adhered to.	Throughout construction
<b>Loss of terrestrial species – fauna:</b> Although most of the species observed are mobile, the increase in vehicle movement could result in an increase in road mortalities.	<ol style="list-style-type: none"> <li>1. Clear demarcation during the construction phase of all undisturbed sensitive areas that are not within the direct footprint of the REF to ensure that there is no uncontrolled access by construction vehicles and labourers;</li> <li>2. ECO / EO (whichever is applicable) must be present on a daily basis to remove any reptiles such as the Karoo Padloper if present.</li> <li>3. Educate contractors as to the importance of the undisturbed</li> </ol>	Holder of the EA ECO/specialist	Construction Monitoring and audit reports	Impacts avoided or managed as per specialist recommendations.  Ensure the conditions of the EA are adhered to.	Throughout construction

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
	<p>conservations areas and importance of avoiding them;</p> <p>4. All vehicles must stick to designated and prepared roads and adhere to the speed limit on site of 40km/hr;</p> <p>5. Mitigating the risk of poaching by fencing in the accommodation compounds of the construction crews, to prevent individuals from wandering in the veld after hours; banning the possession of dogs on site by construction and maintenance staff.</p>				

### **Biodiversity**

#### **Operation Phase Specific Mitigations:**

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
<p><b>Loss of terrestrial species - fauna</b></p> <p>Although most of the species observed are mobile, the increase in vehicle movement</p>	<p>1. Clear demarcation during the construction phase of all undisturbed sensitive areas that are not within the direct footprint of the REF to ensure that there is no uncontrolled access by</p>	Holder of the EA/Contractor	Construction Monitoring and audit reports	Impacts avoided or managed as per specialist recommendations.	Throughout Operation

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
could result in an increase in road mortalities.	<p>construction vehicles and labourers;</p> <p>2. Educate contractors as to the importance of the undisturbed conservations areas and importance of avoiding them;</p> <p>3. All vehicles must stick to designated and prepared roads and adhere to the speed limit on site of 40km/hr;</p> <p>4. Mitigating the risk of poaching by fencing in the accommodation compounds of the construction crews, to prevent individuals from wandering in the veld after hours; banning the possession of dogs on site by construction and maintenance staff.</p>			Ensure the conditions of the EA are adhered to.	

## **Biodiversity**

### **Decommissioning Phase Specific Mitigations:**

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
<p><b>Loss of species of special concern:</b></p> <p>The construction activities will result in the disturbance of both aquatic and terrestrial habitats that may contain listed and or protected plant or animal species. However, none of these were observed during this assessment within the tower positions proposed</p>	<ol style="list-style-type: none"> <li>1. Develop and implement an Rehabilitation and Monitoring plan post Environmental Authorisation. This plan should include relocation of suitable plant species, but more important protect any topsoil stores and promote the collection of vegetative material and propagules / seed to assist with the revegetation of the site</li> <li>2. Rapid regeneration of plant cover must be encouraged by setting aside topsoil during earthmoving and replacing onto areas where the re-establishment of plant cover is desirable to prevent erosion.</li> </ol>	Holder of the EA ECO/specialist	Construction Monitoring and audit reports	<p>Impacts avoided or managed as per specialist recommendations.</p> <p>Alien Plant Management Plan Implemented</p> <p>Plant Rehabilitation Implemented</p> <p>Ensure the conditions of the EA are adhered to.</p>	Throughout Decommissioning
<p><b>Loss of terrestrial habitats – flora and vegetation:</b></p> <p>The construction of the proposed infrastructure will require the need to clear vegetation which</p>	<ol style="list-style-type: none"> <li>1. All alien plant re-growth, which is currently low within the greater region must be monitored and should it occur, these plants must be eradicated within the project footprints.</li> </ol>	Holder of the EA ECO/specialist	Construction Monitoring and audit reports	Impacts avoided or managed as per specialist recommendations.	Throughout Decommissioning

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
could then have a secondary impact on ecological connectivity and especially Critical Biodiversity Areas, linked to the large riverine corridors.	2. Rapid regeneration of plant cover must be encouraged by setting aside topsoil during earthmoving and replacing onto areas where the re-establishment of plant cover is desirable to prevent erosion.				
<b>Loss of terrestrial species – fauna:</b> Although most of the species observed are mobile, the increase in vehicle movement could result in an increase in road mortalities.	1. Clear demarcation during the construction phase of all undisturbed sensitive areas that are not within the direct footprint of the REF to ensure that there is no uncontrolled access by construction vehicles and labourers; 2. ECO / EO (whichever is applicable) must be present on a daily basis to remove any reptiles such as the Karoo Padloper if present. 3. Educate contractors as to the importance of the undisturbed conservations areas and importance of avoiding them; 4. All vehicles must stick to designated and prepared roads	Holder of the EA ECO/specialist	Construction Monitoring and audit reports	Impacts avoided or managed as per specialist recommendations.	Throughout Decommissioning

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
	<p>and adhere to the speed limit on site of 40km/hr;</p> <p>5. Mitigating the risk of poaching by fencing in the accommodation compounds of the construction crews, to prevent individuals from wandering in the veld after hours; banning the possession of dogs on site by construction and maintenance staff.</p>				

## **Archaeological:**

### **General Recommendations and Mitigation Measures**

The project will encompass a range of activities during the construction phase, including vegetation clearance, excavations and infrastructure development associated with the project.

It is possible that cultural material will be exposed during construction and may be recoverable, keeping in mind delays can be costly during construction and as such must be minimised. Development surrounding infrastructure and construction of facilities results in significant disturbance, however foundation holes do offer a window into the past, and it thus may be possible to rescue some of the data and materials. It is also possible that substantial alterations will be implemented during this phase of the project, and these must be catered for. Temporary infrastructure developments are often changed or added to the project as required. In general, these are low impact developments as they are superficial, resulting in little alteration of the land surface, but still need to be catered for.

During the construction phase, it is important to recognize any significant material being unearthed, making the correct judgment on which actions should be taken. It is recommended that the following chance find procedure should be implemented as part of the Environmental Management Programme (EMPr).

### **Chance finds procedure**

- A heritage practitioner / archaeologist should be appointed to develop a heritage induction program and conduct training for the ECO as well as team leaders in the identification of heritage resources and artefacts. The ECO (following this training) can be permitted to provide similar induction and awareness training to contractors that will undertake construction of the project.
- An appropriately qualified heritage practitioner / archaeologist must be identified to be called upon if any possible heritage resources or artefacts are identified.
- Should an archaeological site or cultural material be discovered during construction (or operation), the area should be demarcated, and construction activities halted using the appropriate protocol.
- The qualified heritage practitioner / archaeologist will then need to come out to the site and evaluate the extent and importance of the heritage resources and make the necessary recommendations for mitigating the find and the impact on the heritage resource.
- An induction and training program on managing archaeological resources must be included in the induction programs for the Environmental Control/Site Officer working on the project.
- An assessment of the footprint areas must be done if the project is to commence immediately pre-construction and any findings must be handled through the Chance finds protocol.
- Construction can commence as soon as the site has been cleared and signed off by the heritage practitioner / archaeologist.

### **Possible finds during construction**

The study area occurs within a greater historical and archaeological site as identified during the desktop and fieldwork phase. Soil clearance for infrastructure as well as the proposed development activities, could uncover the following:

- High density concentrations of stone artefact; and
- Unmarked graves.

### **Timeframes**

It must be kept in mind that mitigation and monitoring of heritage resources discovered during construction activity will require permitting for collection or excavation of heritage resources and lead times must be worked into the construction time frames. Guidelines for lead times on permitting are provided below.

#### **Lead times for permitting and mobilisation**

<b>Action</b>	<b>Responsibility</b>	<b>Timeframe</b>
Preparation for field monitoring and finalisation of contracts	The contractor and service provider	Approximately 1 month
Application for permits to do necessary mitigation work	Service provider – Archaeologist and HWC	Approximately 3 months
Documentation, excavation and archaeological report on the relevant site	Service provider – Archaeologist	Approximately 3 months
Handling of chance finds – Graves/Human Remains	Service provider – Archaeologist and HWC	Approximately 2 weeks
Relocation of burial grounds or graves in the way of construction	Service provider – Archaeologist, HWC, local government and provincial government	Approximately 6 months

#### **Pre-construction Phase Specific Mitigations:**

<b>IMPACT</b>	<b>IMPACT MANAGEMENT ACTIONS</b>	<b>RESPONSIBILITY</b>	<b>IMPACT MANAGEMENT OUTCOMES</b>	<b>TIMEFRAMES</b>
<b>Archaeology</b> General project area	1. An induction and training program on managing archaeological resources must be included in the induction programs for the Environmental Control/Site Officer working on the project.	Applicant ECO Heritage Specialist	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 34-36 and 38 of NHRA	During construction and operation



IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<ol style="list-style-type: none"> <li>2. An assessment of the footprint areas must be done if the project is to commence immediately pre-construction and any findings must be handled through the Chance finds protocol.</li> <li>1. Implement chance find procedures in case where possible heritage finds are uncovered.</li> </ol>			
<b>Archaeology</b> Graves and Burial grounds (H006, H016)	<ol style="list-style-type: none"> <li>1. The sites should be demarcated with a 50-meter no-go-buffer-zone and the graves should be avoided and left in situ.</li> <li>2. A Grave Management Plan should be developed for the graves, to be implemented during the construction and operation phases (which needs approval by HWC prior to construction).</li> <li>2. If the site is going to be impacted directly and the graves need to be removed a grave relocation process for these sites is recommended as a mitigation and management measure. This will involve the necessary social consultation and public participation process before grave relocation permits can be applied for with the HWC under the NHRA and National Health Act regulations.</li> </ol>	Applicant ECO	Ensure compliance with relevant legislation and recommendations from HWC under Section 36 and 38 of NHRA	Construction

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<b>Archaeology -Historical Structures-</b> that were rated as low heritage significance (H007, H015, H017) and don't fall within an area demarcated for development.	3. The documentation of the site in this HIA report is sufficient and the site can be destroyed without a permit, only with the approval of this report as provided here. <b>No mitigation is required.</b>	Applicant	Ensure compliance with relevant legislation and recommendations from HW under Section 36 and 38 of NHRA	Throughout Pre-Construction
<b>Archaeology -Historical Structures-</b> that were rated as medium heritage significance (H001, H002, H008, H014, H014/1).	<ol style="list-style-type: none"> <li>1. As the sites are located less than 100m adjacent to an existing farm road, it is possible that the sites will be impacted upon if the road is expanded.</li> <li>2. If there are plans to expand the current farm road, it is recommended that a no-go-buffer-zone of at least 30m is kept to the closest WEF infrastructure.</li> <li>3. If development occurs within 30m of the site, the structure will need to be satisfactorily studied and recorded before impact occurs.</li> <li>4. Recording of the structure i.e. (a) map indicating the position and footprint of the structure (b) photographic recording of the structure (c) measured drawings of the floor plans of the structure.</li> <li>5. A baseline report must be compiled for the site within which the recorded drawings from the previous item as well as all existing information on the</li> </ol>	Applicant	Ensure compliance with relevant legislation and recommendations from HW under Section 36 and 38 of NHRA	Throughout Pre-Construction

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>structure can be included. This baseline report will then be utilised as a part of the HMP to determine any future unforeseen impacts on the heritage resources.</p> <p>6. The baseline report must be submitted to the relevant heritage authorities with a permit application in the event that the site will be impacted.</p>			
<p><b>Archaeology -Stone Age Sites-</b> that were rated as medium heritage significance (H013, H013/1, H013/3) but don't fall within an area demarcated for development.</p>	<ol style="list-style-type: none"> <li>1. A 30m buffer is recommended to retain the sites integrity.</li> <li>2. If the site can't be avoided, then it must be sampled by a qualified specialist under a permit issued by SAHRA</li> <li>3. A management plan, for the heritage resources needs then to be compiled and approved for implementation during construction and operations. No mitigation required.</li> </ol>	Applicant	Ensure compliance with relevant legislation and recommendations from HW under Section 36 and 38 of NHRA	Throughout Pre-Construction

**Archaeological:**

**Construction Phase Specific Mitigations:**

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT OUTCOMES	MANAGEMENT	TIMEFRAMES
Same as pre-construction					

**Archaeological:**

**Operation Phase Specific Mitigations:**

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT OUTCOMES	MANAGEMENT	TIMEFRAMES
None identified					

**Archaeological:**

**Decommissioning Phase Specific Mitigations:**

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT OUTCOMES	MANAGEMENT	TIMEFRAMES
None identified					

**Palaeontology:**

**Pre-Construction Phase Specific Mitigations:**

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<b>Paleontology:</b> Disturbance, damage or destruction of fossil remains preserved at or below the ground surface through site clearance of bedrock excavations.	1. Assessment of footprint areas immediately before construction commence.  Monitoring of substantial, deeper excavations (> 1m)	Specialist palaeontologist appointed by developer  ECO / ESO	Reporting and safeguarding of significant new fossil finds (e.g. vertebrate bones, teeth, petrified wood, shells) to Heritage Western Cape for potential mitigation.	Before and going throughout Construction Phase
	2. Submission of Work Plan to / application for Fossil Collection permit from responsible Heritage Resources Agency (PRHA) Recording and sampling / collection of significant new fossil finds that have been reported by ECO / ESO	Specialist palaeontologist appointed by developer	Conservation and recording of new fossil material of scientific / conservation value within project area	Triggered by alert from ECO / ESO / PHRA
	Palaeontological mitigation reporting to responsible Heritage Resources Agency (PRHA)	Specialist palaeontologist	Conservation and recording of new fossil material of scientific / conservation value within project area	Following specialist palaeontological mitigation

**Palaeontology:****Construction Phase Specific Mitigations:**

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
Paleontology – Fossil heritage resources – Disturbance, damage or destruction of fossils at or beneath the ground surface due to surface clearance and bedrock excavations	1. Assessment of footprint areas immediately before construction commence. 2. Monitoring of substantial, deeper excavations (> 1m)	Paleontologist/ECO	Reporting and safeguarding of significant new fossil finds (e.g. vertebrate bones, teeth, petrified wood, shells) to Heritage Western Cape for potential mitigation.	Before and going throughout Construction Phase
	1. Submission of Work Plan to / application for Fossil Collection permit from responsible Heritage Resources Agency (PRHA) 2. Recording and sampling / collection of significant new fossil finds that have been reported by ECO / ESO	Paleontologist	Conservation and recording of new fossil material of scientific / conservation value within project area	Triggered by alert from ECO / ESO / PHRA
	1. Palaeontological mitigation reporting to responsible Heritage Resources Agency (PRHA)	Paleontologist	Conservation and recording of new fossil material of scientific / conservation value within project area	Following specialist palaeontological mitigation

**Palaeontology:**

**Operation Phase Specific Mitigations:**

Aspect	Mitigation measures	Phase	Target
None identified			

**Palaeontology:**

**Decommissioning Phase Specific Mitigations:**

Aspect	Mitigation measures	Phase	Target
None identified			

**Cultural Landscape:**

**Pre-construction Phase Specific Mitigations**

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<b>Cultural landscape - Ecological</b>	<ol style="list-style-type: none"><li>1. Critical Biodiversity Areas, and Ecological Support Areas (along drainage lines), should be protected from development of the wind turbines or any associated development during all phases.</li><li>2. No wind turbines should be placed within the 1:100-year flood line of the watercourses. In the context of the sensitivity to soil erosion in the area, as well as potential archaeological resources, it would be a risk</li></ol>	Holder of the EA	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 38 of NHRA	Throughout Pre-construction

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>to include any structures close to these drainage lines and specialist recommendations must be taken into account.</p> <ol style="list-style-type: none"> <li>Identified medicinal plants used for healing or ritual purposes should be conserved during all phases if threatened for use and continued access to these resources be maintained.</li> <li>Careful planning should incorporate areas for stormwater runoff where the base of the structure disturbed the natural soil. Local rocks found on the site could be used to slow stormwater (instead of concrete, or standard edge treatments), and prevent erosion that would be an unfortunate consequence that would alter the character of the site. By using rocks from site it helps to sensitively keep to the character.</li> </ol>			
<b>Cultural landscape - Aesthetic</b>	<ol style="list-style-type: none"> <li>Where additional infrastructure (i.e. roads) is needed, the upgrade of existing roads to accommodate the development should be the first consideration.</li> <li>Avoid development of infrastructure (such as buildings, wind turbines and power lines), on crests or ridgelines due to the impact on the visual sensitivity of skylines. The visual impact of turbines can be reduced by distancing them from viewpoints such as roads and farmsteads, and placing them in lower lying plains to reduce their impact on the surrounding sensitive cultural landscape.</li> </ol>	Holder of the EA	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 38 of NHRA	Throughout Pre-construction



IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<ol style="list-style-type: none"> <li>3. Significant and place-making viewsheds of surrounding ridgelines and distant mountain should be maintained by limiting the placement of turbines or associated infrastructure on opposing sides of any of the regional roads, so that at any time a turbine-free view can be found when travelling through the landscape or at the historic farmsteads.</li> <li>4. Retain view-lines and vistas focused on prominent natural features such as mountain peaks or hills, as these are important place making and orientating elements for experiencing the cultural landscape.</li> <li>5. Prevent the construction of new buildings/structures/ new roads on visually sensitive, steep, elevated or exposed slopes, ridgelines and hillcrests.</li> <li>6. Turbine and new road placement to avoid slopes steeper than 10% with existing farm roads to be used for access to turbines as far possible. The low gradient is relative to the context of the landscape, which is flat and expansive.</li> <li>7. Due to the scenic and historic significance of the regional road, a buffer of 1000m to either side of the N12 should be maintained for no development associated with the WEF other than sensitive road upgrades, which must not impact on the views from the road.</li> <li>8. Two relevant poorts on the N12 offer views of the vast flat Koup landscape and the Heuweltjies WEF site. 1) A</li> </ol>			

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>smaller poort alongside the Amospoortjie farmstead as one travels south on the N12 (recommended grading IIIC) which runs through one of the east west ridges of the Koup landscape. 2) On travelling north through the Meiringspoort Pass (Grade II), this portion of the N12 that travels through the Swartberg range, culminates in a poort through the last ridge of the mountain range, which opens up with dramatic views of the vast flat landscape of the Koup Karoo. This poort is located 11kms from the nearest proposed Heuweltjies turbine and is of medium sensitivity at this distance.</p> <p>9. To support the continued occupation of the homesteads on the landscape, the turbines should be placed at a suitable distance from any occupied homestead. Trakaskuilen and Lammerkraal both dated to pre-1965 can be graded IIIB and an 800m buffer would be minimum. Trakaskuilen and Lammerkraal are currently not negatively impacted by the proposed development. Any associated gravesites are graded IIIA.</p> <p>10. Due to the historic and local experience of the landscape from the regional farm road running across the north of Klipgat portion, which links the historically significant farmsteads across the region, a buffer of 300m from the regional road still in use should be maintained for no development associated with the WEF other than sensitive road upgrades which must</p>			

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>not impact on the views from the road. (200m no-go turbine buffer and 100m high sensitivity buffer where turbine placement is subject to specialist approval, if required;</p> <p>11. The preferred substation in terms of cultural landscapes assessment is location 2 as it is located further away from the regional road.</p> <p>12. The impact of WEF turbine night lighting on the wilderness landscape is intrusive and overwhelms the rural character of the landscape, giving it an industrial sense of place after dark. Reduce the impact of turbine night lighting by minimizing the number of turbines with lighting to only those necessary for aviation safety such as a few identified turbines on the outer periphery, or use aircraft triggered night lighting. Due to the reduced receptors on the roads at night, the impact of the lighting at night is reserved mainly for farmsteads and other places of overnight habitation such as the surrounding tourist facilities, which would be heavily impacted by the light pollution on a long term and ongoing basis.</p>			
<b>Cultural landscape – Socio-economic</b>	<p>1. The findings of this report must be shared with identified interested and affected parties, including non-landowner residents on the development properties, in the EIA public participation process in order to further ascertain any intangible cultural resources that may exist on the landscape that have</p>	Holder of the EA	Ensure compliance with relevant legislation and recommendations from SAHRA under	Throughout Pre-construction

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>not been identified. A specialist qualified in recognizing and discussing the significance of intangible heritage resources should be present during the public meetings. The findings should inform the recommendations for appropriate mitigation for impacts to the cultural landscape.</p> <ol style="list-style-type: none"> <li>2. The continued use of the landscape for human habitation and cultivation by historic residents of the area, should be retained and encouraged as far possible to sustain the continual use pattern and human-environment relationship which is the ultimate significance of this cultural landscape element. The WEF development must allow and support this, including financially, and not degrade this continued relationship.</li> <li>3. The local community on and around the development should benefit from job opportunities created by the proposed development and the development should not cause reduction in economic viability of surrounding properties in excess of those offered by the development. Short-term job opportunities at the expense of long term economic benefit and local employment opportunities must be prevented.</li> <li>4. Local residents must be offered the opportunity for employment on the construction/ decommissioning and operational phases before 'importing' staff from elsewhere.</li> </ol>		Section 38 of NHRA	

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	5. Local residents must be offered employment training opportunities associated with WEF developments at all phases.			

### **Cultural Landscape:**

#### **Construction Phase Specific Mitigations**

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<b>Cultural landscape - Ecological</b>	<ol style="list-style-type: none"> <li>1. Critical Biodiversity Areas, and Ecological Support Areas (along drainage lines), including wetlands and dams, should be protected from development as far as possible of the wind turbines or any associated development during all phases.</li> <li>2. No wind turbines should be placed within the 1:100-year flood line of the watercourses, unless otherwise advised by the aquatic specialist. In the context of the sensitivity to soil erosion in the area, as well as potential archaeological resources, it would be a risk to include any structures close to these drainage lines. This recommendation can be waived if the archaeological or hydrological / aquatic specialist reports recommend different buffers.</li> </ol>	Holder of the EA	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 38 of NHRA	Throughout Construction

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<ol style="list-style-type: none"> <li>3. Remaining areas of endemic and endangered natural vegetation should be conserved in line with relevant specialist buffers.</li> <li>4. Critical Biodiversity Areas, and Ecological Support Areas (along drainage lines), should be protected as far as possible from development of the wind turbines or any associated development during all phases in line with relevant ecological and aquatic specialist recommended buffers.</li> <li>5. Areas of critical biodiversity should be protected from any damage during all phases, where indigenous and endemic vegetation should be preserved at all cost.</li> <li>6. Areas of habitat are found among the rocky outcrops and contribute to the character, as well as biodiversity of the area. Care should be taken that habitats are not needlessly destroyed.</li> <li>7. Identified medicinal plants used for healing or ritual purposes should be conserved during all phases if threatened for use.</li> <li>8. Careful planning should incorporate areas for stormwater runoff where the base of the structure disturbed the natural soil. Local rocks found on the site could be used to slow stormwater (instead of concrete, or standard edge treatments), and prevent erosion that would be an unfortunate consequence that would alter the character of the site. By using rocks from site it helps to sensitively keep to the character.</li> </ol>			

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<b>Cultural landscape - Aesthetic</b>	<ol style="list-style-type: none"> <li>1. Where additional infrastructure (i.e. roads) is needed, the upgrade of existing roads to accommodate the development should be the first consideration.</li> <li>2. Avoid development of infrastructure (such as buildings, wind turbines and power lines), on crests or ridgelines due to the impact on the visual sensitivity of skylines. The visual impact of turbines can be reduced by distancing them from viewpoints such as roads and farmsteads, and placing them in lower lying plains to reduce their impact on the surrounding sensitive cultural landscape.</li> <li>3. Significant and place-making viewsheds of surrounding ridgelines and distant mountain should be maintained by limiting the placement of turbines or associated infrastructure on opposing sides of any of the regional roads, so that at any time a turbine-free view can be found when travelling through the landscape or at the historic farmsteads</li> <li>4. Retain view-lines and vistas focused on prominent natural features such as mountain peaks or hills, as these are important place making and orientating elements for experiencing the cultural landscape.</li> <li>5. Prevent the construction of new buildings/structures/ new roads on visually sensitive, steep, elevated or exposed slopes, ridgelines and hillcrests.</li> <li>6. Turbine and new road placement to avoid slopes steeper than 10% with existing farm roads to be used for access to turbines as far possible. The low gradient</li> </ol>	Holder of the EA/ Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 38 of NHRA	Throughout Construction

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>is relative to the context of the landscape, which is flat and expansive.</p> <p>7. Two relevant poorts on the N12 offer views of the vast flat Koup landscape and the Heuweltjies WEF site. 1) A smaller poort alongside the Amospoortjie farmstead as one travels south on the N12 (recommended grading IIIC) which runs through one of the east west ridges of the Koup landscape. 2) On travelling north through the Meiringspoort Pass (Grade II), this portion of the N12 that travels through the Swartberg range, culminates in a poort through the last ridge of the mountain range, which opens up with dramatic views of the vast flat landscape of the Koup Karoo. This poort is located 11kms from the nearest proposed Heuweltjies turbine and is of medium sensitivity at this distance.</p> <p>8. To support the continued occupation of the homesteads on the landscape, the turbines should be placed at a suitable distance from any occupied homestead. Trakaskuilen and Lammerkraal both dated to pre-1965 can be graded IIIB and an 800m buffer would be minimum. Trakaskuilen and Lammerkraal are currently not negatively impacted by the proposed development. Any associated gravesites are graded IIIA</p> <p>9. Due to the historic and local experience of the landscape from the regional farm road running across the north of Klipgat portion, which links the historically significant farmsteads across the region, a buffer of</p>			



IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>300m (200m no-go buffer for all turbine infrastructure other than sensitive road upgrade, and 100m high sensitivity buffer where infrastructure placement is subject to specialist approval); from the regional road still in use should be maintained and any road upgrades must not impact on the views from the road.</p> <p>10. The preferred substation in terms of cultural landscapes assessment is location 2 as it is located further away from the regional road.</p> <p>11. Substation Option 1 is acceptable if all permanent infrastructure, other than roads, underground cabling and guard house, can be kept out of the regional road 200m no-go buffer on final construction.</p> <p>12. The impact of WEF turbine night lighting on the wilderness landscape is intrusive and overwhelms the rural character of the landscape, giving it an industrial sense of place after dark. Reduce the impact of turbine night lighting by minimizing the number of turbines with lighting to only those necessary for aviation safety such as a few identified turbines on the outer periphery, or use aircraft triggered night lighting. Due to the reduced receptors on the roads at night, the impact of the lighting at night is reserved mainly for farmsteads and other places of overnight habitation such as the surrounding tourist facilities, which would be heavily impacted by the light pollution on a long term and ongoing basis.</p>			

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<b>Cultural landscape - Historic</b>	<ol style="list-style-type: none"> <li>1. Historic farmsteads must be protected from the impacts of heavy construction vehicles and increased numbers of people. No construction traffic should pass through or closer than 50m to any outlying graded heritage structure, which includes the associated historically cultivated lands, cemeteries, unmarked burials. The most appropriate use of existing farm roads must be found to avoid farm werfs as far as possible and reduce construction impact on these heritage features. The AIA buffer recommendations should take preference for identified archaeological heritage resources</li> <li>2. Duration and magnitude of construction/ decommissioning activity must be minimized as far possible to reduce the impact of heavy vehicles on the roads as well as the associated dust from the activity. Lightest vehicles possible should be used to reduce degradation to the farm roads and the need to upgrade roads to scale and extent that negatively impacts on the integrity of the historic farm roads. Construction decommissioning traffic must operate at speeds that reduce dust and noise as far possible</li> <li>3. Accommodation of construction staff must not negatively impact on existing farm residents or degrade the integrity of the farmstead complexes and should, without negative impact to ecological or aesthetic resources, be located outside of the farmstead complexes or site. Farm residents should be</li> </ol>	Holder of the EA/ Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 38 of NHRA	Throughout Construction

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>consulted on the preferable location for construction staff accommodation.</p> <p>4. Traditional planting patterns should be protected by ensuring that existing trees are not destroyed as these signify traces of cultural intervention in a harsh environment. These planting patterns include the trees planted around the werfs and along travel routes. Interpretation of these landscape features as historic remnants should occur. A buffer of 50m around such planting patterns, associated with cultural landscapes elements and farmsteads as identified in this report, should be maintained.</p> <p>5. Burial grounds and places of worship are automatically regarded as Grade IIIa or higher. Any development that threatens the inherent character of family burial grounds must be assessed and a buffer of 50m around all burial ground or unmarked graves should be in place. No turbines have been proposed for placement near known unmarked burials or family cemeteries. These recommendations should be considered together with the AIA report and the AIA recommendations should take preference for stand-alone burial grounds or graves where they are not associated with other heritage features or cultural landscape elements.</p> <p>6. Mountain slopes have been used for traditional practices for many years, and care should be taken</p>			

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>that any significant cultural sites, such as burials and veldkos/medicinal plant resources, are not disturbed.</p> <p>7. Farms in the area followed a system of stone markers to demarcate the farm boundaries in the area. Where these structures are found on the site, care should be taken that they are not needlessly destroyed, as they add to the layering of the area.</p> <p>8. Roads running through the area have historic stone way markers. Where these are found, care should be taken that they are left intact and in place. Road upgrades and or new roads must not move or threaten their position and they should be visible from the road they are related to by passing travellers. Final buffers for stone markers will be for identification and mitigation in collaboration with the ECO prior to construction and approval by heritage specialist.</p> <p>9. Where the historic function of a building/site is still intact, the function has heritage value and should be protected.</p> <p>10. Surviving examples (wagon routes, outspans, and commonage), where they are owned in some public or communal way (or by a body responsible for acting in the public interest) and where they are found to be actively operating in a communal way, will have cultural and heritage value and should be enhanced and retained. The historic route running through Heuweltjies should be maintained and integrity as a communal road for farm residents must be retained.</p>			

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<b>Cultural landscape -</b> Socio-economic	<ol style="list-style-type: none"> <li>1. An updated cultural landscapes impact assessment report must be completed should the WEF continue to be used after the term granted in this application. This report should include a detailed assessment of the socio-economic impacts to the cultural landscape and its outcomes and recommendations need to be considered in the decision for recommissioning and be implemented if recommissioning is approved.</li> <li>2. The continued use of the landscape for human habitation and cultivation by historic residents of the area, should be retained and encouraged as far possible to sustain the continual use pattern and human-environment relationship which is the ultimate significance of this cultural landscape element. The WEF development must allow and support this, including financially, and not degrade this continued relationship.</li> <li>3. The local community on and around the development should benefit from job opportunities created by the proposed development and the development should not cause reduction in economic viability of surrounding properties in excess of those offered by the development. Short-term job opportunities at the expense of long-term economic benefit and local employment opportunities must be prevented.</li> <li>4. Local residents must be offered the opportunity for employment on the construction/ decommissioning</li> </ol>	Holder of the EA/ Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 38 of NHRA	Throughout Construction

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>and operational phases before 'importing' staff from elsewhere.</p> <p>5. Local residents must be offered employment training opportunities associated with WEF developments at all phases</p> <p>6. Sheep, cattle or game farming should be allowed to continue below the wind turbines or be rehabilitated to increase biodiversity in the area.</p>			

#### **Cultural Landscape:**

#### **Operation Phase Specific Mitigations**

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<b>Cultural landscape - Ecological</b>	<ol style="list-style-type: none"> <li>1. Areas of endemic and endangered natural vegetation should be conserved.</li> <li>2. Critical Biodiversity Areas, and Ecological Support Areas (along drainage lines), including manmade wetlands and dams, should be protected as far possible.</li> <li>3. Areas of habitat are found among the rocky outcrops and contribute to the character, as well as biodiversity of the area. Care should be taken that habitats are not needlessly destroyed.</li> <li>4. Identified medicinal plants used for healing or ritual purposes should be conserved during all phases if</li> </ol>	Holder of the EA/Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 38 of NHRA	Throughout Operation

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	threatened for use. Access to these resources should be made available to those who have had historic access to them.			
<b>Cultural landscape - Aesthetic</b>	<ol style="list-style-type: none"> <li>1. Infrastructure improvement or maintenance work, including new roads and upgrades to the road network, should be appropriate to the rural context (scale, material etc.) and avoid steep slopes over 10% as well as ridges.</li> <li>2. Prevent the construction of new buildings/structures on visually sensitive, steep (over 10%), elevated or exposed slopes, ridgelines and hillcrests or within farmstead and N12 buffers and 300m of the regional farm roads.</li> <li>3. Avoid visual clutter in the landscape by intrusive signage, and the intrusion of commercial, corporate development along roads.</li> <li>4. Duration and magnitude of operational activity must be minimized as far possible to reduce the impact of heavy vehicles on the roads as well as the associated dust from the activity. Lightest vehicles possible should be used to reduce degradation to the farm roads and the need to upgrade roads to scale and extent that negatively impacts on the integrity of the historic farm roads. Operational traffic must operate at speeds that reduce dust and noise as far possible</li> <li>5. The impact of WEF turbine night lighting on the wilderness landscape is intrusive and overwhelms</li> </ol>	Holder of the EA/Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 38 of NHRA	Throughout Operation

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	the rural character of the landscape, giving it an industrial sense of place after dark. Reduce the impact of turbine night lighting by minimizing the number of turbines with lighting to only those necessary for aviation safety, such as a few identified turbines on the outer periphery, or use aircraft triggered night lighting. Due to the reduced receptors on the roads at night, the impact of the lighting at night is reserved mainly for farmsteads and other places of overnight habitation such as the surrounding tourist facilities, which would be heavily impacted by the light pollution on a long term and ongoing basis.			
<b>Cultural landscape - Historic</b>	<ol style="list-style-type: none"> <li>1. Historic farmsteads must be protected from the impacts of operational facility vehicles and increased numbers of people. No WEF operations traffic should pass within 50m from graded structures, which includes the associated historically cultivated lands, cemeteries, unmarked burials. The most appropriate use of existing farm roads must be found to avoid farm werfs as far as possible and reduce construction impact on these heritage features. The AIA buffer recommendations should take preference for identified archaeological heritage resources.</li> <li>2. Traditional planting patterns should be protected by ensuring that existing trees are not destroyed as these signify traces of cultural intervention in a harsh environment. These planting patterns include the trees planted around the werfs and along travel routes. Interpretation of these landscape features</li> </ol>	Holder of the EA/Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 38 of NHRA	Throughout Operation



IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>as historic remnants should occur. A buffer of 50m around such planting patterns, associated with cultural landscapes elements and farmsteads as identified in this report, should be maintained.</p> <ol style="list-style-type: none"> <li>3. Burial grounds and places of worship are automatically regarded as Grade IIIa or higher. Any development that threatens the inherent character of family burial grounds must be assessed and should be discouraged and a buffer of 50m around any burial ground or unmarked graves should be in place. No turbines have been proposed for placement near known unmarked burials or family cemeteries. These recommendations should be considered together with the AIA report and the AIA recommendations should take preference for stand-alone burial grounds or graves where they are not associated with other heritage features or cultural landscape elements.</li> <li>4. Mountain slopes have been used for traditional practices for many years, and care should be taken that any significant cultural sites, such as burials and veldkos/medicinal plant resources, are not disturbed.</li> <li>5. Farms in the area followed a system of stone markers to demarcate the farm boundaries in the area. Where these structures are found on the site, care should be taken that they are not needlessly destroyed, as they add to the layering of the area.</li> <li>6. Roads running through the area may have historic stone way markers. Where these are found care should be taken that they are left intact and in place. Road upgrades must not move or threaten</li> </ol>			

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>their position and they should be visible from the road they are related to by passing travellers.</p> <p>7. Where the historic function of a building/site is still intact, the function has heritage value and should be protected.</p> <p>8. Surviving examples (wagon routes, outspans, and commonage), where they are owned in some public or communal way (or by a body responsible for acting in the public interest) and where they are found to be actively operating in a communal way, will have cultural and heritage value and should be enhanced and retained. The historic route running through Heuweltjies should be maintained and integrity as a communal road for farm residents must be retained.</p> <p>9. Accommodation of WEF staff must not negatively impact on existing farm residents or degrade the integrity of the farmstead complexes and should, without negative impact to ecological or aesthetic resources, be located outside of the farmstead complexes or site. Farm residents should be consulted on the preferable location for construction staff accommodation.</p> <p>10. Lightest vehicles possible should be used to reduce degradation to the farm roads and the need to upgrade roads to scale and extent that negatively impacts on the integrity of the historic farm roads. Operational traffic must operate at speeds that reduce dust and noise as far possible.</p>			
<b>Cultural landscape - Socio-economic</b>	1. The local community on and around the development should benefit from job opportunities	Holder of the EA/Contractor	Ensure compliance with	Throughout Operation

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>created by the proposed development, and the development should not cause reduction in economic viability of surrounding properties in excess of those offered by the development. Short-term job opportunities at the expense of long term economic benefit and local employment opportunities must be prevented.</p> <ol style="list-style-type: none"> <li>2. The continued use of the landscape for human habitation and cultivation by historic residents of the area, should be retained and encouraged as far possible to sustain the continual use pattern and human-environment relationship which is the ultimate significance of this cultural landscape element. The WEF development must allow and support this, including financially, and not degrade this continued relationship.</li> <li>3. Local residents must be offered the opportunity for employment on the construction/ decommissioning and operational phases before 'importing' staff from elsewhere.</li> <li>4. Local residents must be offered employment training opportunities associated with WEF developments at all phases.</li> <li>5. Crop cultivation, sheep, cattle or game farming should be allowed to continue below the wind turbines, or be rehabilitated to increase biodiversity in the area.</li> </ol>		<p>relevant legislation and recommendations from SAHRA under Section 38 of NHRA</p>	

### Cultural Landscape:

#### Decommissioning Phase Specific Mitigations

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<b>Cultural landscape - Ecological</b>	<ol style="list-style-type: none"><li>1. Critical Biodiversity Areas, and Ecological Support Areas (along drainage lines), including wetlands and dams, should be protected from development as far as possible of the wind turbines or any associated development during all phases.</li><li>2. No wind turbines should be placed within the 1:100-year flood line of the watercourses, unless otherwise advised by the aquatic specialist. In the context of the sensitivity to soil erosion in the area, as well as potential archaeological resources, it would be a risk to include any structures close to these drainage lines. This recommendation can be waived if the archaeological or hydrological / aquatic specialist reports recommend different buffers.</li><li>3. Remaining areas of endemic and endangered natural vegetation should be conserved in line with relevant specialist buffers.</li><li>4. Critical Biodiversity Areas, and Ecological Support Areas (along drainage lines), should be protected as far as possible from development of the wind turbines or any associated development during all phases in line with relevant ecological and aquatic specialist recommended buffers.</li><li>5. Areas of critical biodiversity should be protected from any damage during all phases, where</li></ol>	Holder of the EA/ Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 38 of NHRA	Throughout Decommissioning

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>indigenous and endemic vegetation should be preserved at all cost.</p> <p>6. Areas of habitat are found among the rocky outcrops and contribute to the character, as well as biodiversity of the area. Care should be taken that habitats are not needlessly destroyed.</p> <p>7. Identified medicinal plants used for healing or ritual purposes should be conserved during all phases if threatened for use.</p> <p>8. Careful planning should incorporate areas for stormwater runoff where the base of the structure disturbed the natural soil. Local rocks found on the site could be used to slow stormwater (instead of concrete, or standard edge treatments), and prevent erosion that would be an unfortunate consequence that would alter the character of the site. By using rocks from site it helps to sensitively keep to the character.</p>			
<b>Cultural landscape - Aesthetic</b>	<p>1. Encourage mitigation measures (for instance use of vegetation) to 'embed' or disguise the proposed structures within the surrounding tourism and agricultural landscape at ground level, road edges etc;</p> <p>2. The continuation of the traditional use of material could be enhanced with the use of the rocks on the site as building material. This would also help to embed structures into the landscape and should not consist of shipping containers or highly reflective</p>	Holder of the EA/ Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 38 of NHRA	Throughout Decommissioning

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>untreated corrugated sheeting that clutters the landscape and is exacerbates the foreign intrusion on the natural matte landscape.</p> <p>3. Using material found on the site adds to the sense of place and reduces transportation costs of bringing materials to site.</p> <p>4. The local material such as the rocks found within the area could be applied to address storm water runoff from the road to prevent erosion.</p> <p>5. Duration and magnitude of construction/ decommissioning activity must be minimized as far possible to reduce the impact of heavy vehicles on the roads as well as the associated dust from the activity. Lightest vehicles possible should be used to reduce degradation to the farm roads and the need to upgrade roads to scale and extent that negatively impacts on the integrity of the historic farm roads. Construction/ decommissioning traffic must operate at speeds that reduce dust and noise as far possible</p>			
<b>Cultural landscape - Historic</b>	<p>1. Historic farmsteads must be protected from the impacts of heavy construction vehicles and increased numbers of people. No construction traffic should pass through or closer than 50m to any outlying graded heritage structure, which includes the associated historically cultivated lands, cemeteries, unmarked burials. The most appropriate</p>	Holder of the EA/ Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under	Throughout Decommissioning

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>use of existing farm roads must be found to avoid farm werfs as far as possible and reduce construction impact on these heritage features. The AIA buffer recommendations should take preference for identified archaeological heritage resources.</p> <ol style="list-style-type: none"> <li>2. Duration and magnitude of construction/ decommissioning activity must be minimized as far possible to reduce the impact of heavy vehicles on the roads as well as the associated dust from the activity. Lightest vehicles possible should be used to reduce degradation to the farm roads and the need to upgrade roads to scale and extent that negatively impacts on the integrity of the historic farm roads. Construction decommissioning traffic must operate at speeds that reduce dust and noise as far possible.</li> <li>3. Accommodation of construction staff must not negatively impact on existing farm residents or degrade the integrity of the farmstead complexes and should, without negative impact to ecological or aesthetic resources, be located outside of the farmstead complexes or site. Farm residents should be consulted on the preferable location for construction staff accommodation.</li> <li>4. Traditional planting patterns should be protected by ensuring that existing trees are not destroyed as these signify traces of cultural intervention in a harsh</li> </ol>		Section 38 of NHRA	

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>environment. These planting patterns include the trees planted around the werfs and along travel routes. Interpretation of these landscape features as historic remnants should occur. A buffer of 50m around such planting patterns, associated with cultural landscapes elements and farmsteads as identified in this report, should be maintained.</p> <p>5. Burial grounds and places of worship are automatically regarded as Grade IIIa or higher. Any development that threatens the inherent character of family burial grounds must be assessed and a buffer of 50m around all burial ground or unmarked graves should be in place. No turbines have been proposed for placement near known unmarked burials or family cemeteries. These recommendations should be considered together with the AIA report and the AIA recommendations should take preference for stand-alone burial grounds or graves where they are not associated with other heritage features or cultural landscape elements.</p> <p>6. Mountain slopes have been used for traditional practices for many years, and care should be taken that any significant cultural sites, such as burials and veldkos/medicinal plant resources, are not disturbed.</p> <p>7. Farms in the area followed a system of stone markers to demarcate the farm boundaries in the area.</p>			



IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>Where these structures are found on the site, care should be taken that they are not needlessly destroyed, as they add to the layering of the area.</p> <p>8. Roads running through the area have historic stone way markers. Where these are found, care should be taken that they are left intact and in place. Road upgrades and or new roads must not move or threaten their position and they should be visible from the road they are related to by passing travellers. Final buffers for stone markers will be for identification and mitigation in collaboration with the ECO prior to construction and approval by heritage specialist.</p> <p>9. Where the historic function of a building/site is still intact, the function has heritage value and should be protected.</p> <p>10. Surviving examples (wagon routes, outspans, and commonage), where they are owned in some public or communal way (or by a body responsible for acting in the public interest) and where they are found to be actively operating in a communal way, will have cultural and heritage value and should be enhanced and retained. The historic route running through Heuweltjies should be maintained and integrity as a communal road for farm residents must be retained.</p>			

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<b>Cultural landscape -</b> Socio-economic	<ol style="list-style-type: none"> <li>1. An updated cultural landscapes impact assessment report must be completed should the WEF continue to be used after the term granted in this application. This report should include a detailed assessment of the socio-economic impacts to the cultural landscape and its outcomes and recommendations need to be considered in the decision for recommissioning and be implemented if recommissioning is approved.</li> <li>2. The continued use of the landscape for human habitation and cultivation by historic residents of the area, should be retained and encouraged as far possible to sustain the continual use pattern and human-environment relationship which is the ultimate significance of this cultural landscape element. The WEF development must allow and support this, including financially, and not degrade this continued relationship.</li> <li>3. The local community on and around the development should benefit from job opportunities created by the proposed development and the development should not cause reduction in economic viability of surrounding properties in excess of those offered by the development. Short-term job opportunities at the expense of long-term economic benefit and local employment opportunities must be prevented.</li> </ol>	Holder of the EA/ Contractor	Ensure compliance with relevant legislation and recommendations from SAHRA under Section 38 of NHRA	Throughout Decommissioning

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<ol style="list-style-type: none"> <li>4. Local residents must be offered the opportunity for employment on the construction/ decommissioning and operational phases before 'importing' staff from elsewhere.</li> <li>5. Local residents must be offered employment training opportunities associated with WEF developments at all phases.</li> <li>6. Sheep, cattle or game farming should be allowed to continue below the wind turbines or be rehabilitated to increase biodiversity in the area.</li> </ol>			

## **Noise**

### **Pre-construction Phase Specific Mitigations:**

The developer must know that community involvement needs to continue throughout the project. Annoyance is a complicated psychological phenomenon, as with many industrial operations, expressed annoyance with sound can reflect an overall annoyance with the project, rather than a rational reaction to the sound itself. At all stages, surrounding receptors should be informed about the project, providing them with factual information without setting unrealistic expectations. It is counterproductive to suggest that the activities (or facility) will be inaudible due to existing high residual noise levels. The magnitude of the sound levels will depend on a multitude of variables and will vary from day to day and from place to place with environmental and operational conditions. Audibility is distinct from the sound level because it depends on the relationship between the sound level from the activities, the spectral character and that of the surrounding soundscape (both level and spectral character).

The developer must implement a line of communication (i.e., a help line where complaints could be lodged). All potential sensitive receptors should be made aware of these contact numbers. The proposed WEF should maintain a commitment to the local community (people staying within 2,000 m from construction or operational activities) and respond to noise concerns in an expedient fashion. Sporadic and legitimate noise complaints could be raised. For example, sudden and sharp increases in sound levels could result from mechanical malfunctions or perforations or slits in the blades. Problems of this nature can be corrected quickly and it is in the developer's interest to do so.

Continuing management objectives would be:

- Ensure that total daytime construction noise levels are less than 52 dBA at all potential NSDs (dwellings used for residential purposes);
- Ensure that total noise levels due to operational activities are less than 45 dBA at all potential NSDs (dwellings used for residential purposes); and
- Prevent the generation of nuisance noises

### **Environmental Management for planning phase**

<b>Objective:</b> Future project activities not to result in disturbing noises	
<b>Project Components:</b>	Future construction activities and operation of WTG
<b>Potential Impact:</b>	No noise impact during the planning phase
<b>Activity/Risk source</b>	Future construction activities and operation of WTG
<b>Mitigation: Target</b>	Night-time noise levels less than 42 dBA (construction phase) and 45 dBA (operational phase) at locations used for residential purposes

Mitigation: Action / Control		Responsibility	Timeframe
Applicant to re-evaluate the noise impact should the layout be revised where any new WTG are introduced within 1,500 m from an NSR		Applicant	Planning phase, before development of WEF
Applicant to re-evaluate the noise impact should the layout be revised where the number of WTG within 2,500 m from an NSR are increased		Applicant	Planning phase, before development of WEF
Applicant to select and implement mitigation measures to ensure that operational noise levels are less than 45 dBA at all verified NSR (if the dwellings will be used for residential purposes during the operational phase)		Applicant	Planning phase, before development of WEF
Applicant to re-evaluate the noise impact once the WTG layout and WTG specifications was finalised		Applicant	Planning phase, before development of WEF
Design and implementation of a noise monitoring programme to define current ambient sound levels at selected NSR before the construction phase start.		ECO	Before the construction phase start
<b>Performance Indicator</b>	Calculated noise levels should be less than 42 dBA at NSR (at night during the construction phase) and less than 45 dBA (at night during the operational phase) at structures used residential purposes		
<b>Monitoring</b>	No monitoring required during planning phase		

## **Noise**

### **Construction Phase Specific Mitigations:**

<b>Objective:</b> Project activities not to result in noise levels exceeding night-time noise levels of 42 dBA	
<b>Project Components:</b>	Construction activities and construction equipment generating disturbing and nuisance noises
<b>Potential Impact:</b>	Night-time noise levels impacting on the quality of living of people living at NSR
<b>Activity/Risk source</b>	Construction activities
<b>Mitigation: Target</b>	Night-time noise levels less than 42 dBA at locations used for residential purposes

Mitigation: Action / Control		Responsibility	Timeframe
ECO to ensure that equipment is well maintained and fitted with the correct and appropriate noise abatement measures;		ECO	Ongoing during construction phase
ECO to include a component covering environmental noise in the Health and Safety Induction to sensitize all employees and contractors about the potential impact from noise;		ECO	Ongoing during construction phase
ECO to notify NSR before night-time construction activities are to take place within 1,000 m from this NSR (if the structures are used for residential activities during the proposed construction period).		ECO	Construction activities within 1,500 m from NSR, if NSR is used for residential purposes
Performance Indicator	Night-time noise levels less than 42 dBA		
Monitoring	Noise level monitoring before the construction phase start at NSR03 and NSR04.		
	Inspection of equipment by ECO.		

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<b>Noise impacts during the day:</b> Construction activities relating to hardstand areas, digging of foundations for wind turbines, civil works as well as erection of wind turbines	<ol style="list-style-type: none"> <li>Applicant to discuss the projected construction noise levels with NSR, highlighting that while noises will be clearly audible when activities are taking place within 2,000m from NSR, that measures will be implemented to minimise the potential impact on their quality of life;</li> <li>The applicant must plan the completion of noisiest activities (such a pile driving, rock breaking and excavation) during the daytime period.</li> </ol>	Holder of EA/Contractor	Reduction in Noise and thus reduction in chance of complaints arising.  Noise and lighting managed according to approved Method Statement	Semi-continuous measurements conducted over a period of atleast 48 hours, covering at least a full day (06:00 – 22:00) and two full night-time (22:00 – 06:00)

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
			Ensure the EMPr is adhered to.	
<b>Noise impacts at night:</b> Construction activities relating to civil works as well as erection of wind turbines	<ol style="list-style-type: none"> <li>1. Applicant to discuss the projected construction noise levels with NSR, highlighting that while noises will be clearly audible when activities are taking place within 2,000m from NSR, that measures will be implemented to minimise the potential impact on their quality of life;</li> <li>2. The Applicant to minimize night-time activities when working within 2,000m from any structure used for residential purposes where possible. Work should only take place at one WTG location to minimize potential night-time cumulative noises (when working at night within 2,000m from NSR used for residential purposes);</li> <li>3. The applicant must notify the NSR when night-time activities will be taking place within 1,000m from the NSR; and</li> <li>4. The applicant must plan the completion of noisiest activities (such a pile driving, rock breaking and excavation) during the daytime period (even though it is expected that it is highly unlikely that this may take place at night).</li> </ol>	Holder of EA/Contractor	Reduction in Noise and thus reduction in chance of complaints arising.  Noise and lighting managed according to approved Method Statement  Ensure the EMPr is adhered to.	Semi-continuous measurements conducted over a period of atleast 48 hours, covering at least a full day (06:00 – 22:00) and two full night-time (22:00 – 06:00)

## **Noise**

### Operation Phase Specific Mitigations:

<b>Objective:</b> Project activities not to result in noise levels exceeding 45 dBA			
<b>Project Components:</b>	Operation of WTG within 2,000 m from structures used for residential purposes		
<b>Potential Impact:</b>	Noise levels impacting on the quality of living of people living at NSR		
<b>Activity/Risk source</b>	Operation of WTG		
<b>Mitigation: Target</b>	Night-time noise levels less than 45 dBA at locations used for residential purposes		
<b>Mitigation: Action / Control</b>		<b>Responsibility</b>	<b>Timeframe</b>
ECO to conduct noise monitoring when a reasonable and valid noise complaint are received from an NSR living within 2,000m from a WTG of the project.		ECO	Within 2 months after a noise complaint is registered
Noise monitoring to confirm that noise levels associated with operating WTG are less than 45 dBA at all NSR		ECO	During the first year once the project is operational. Noise specialist to confirm need for future measurements.
<b>Performance Indicator</b>	Night-time noise levels less than 45 dBA		

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<b>Noise impacts during the night:</b> Noises from operating wind turbines.	<ul style="list-style-type: none"> <li>The applicant can select a WTG with a lower SPL (e.g., a WTG with a SPL less than 106.5 dBA re 1 pw)</li> <li>The layout can be changed to locate WTG further from NSR, considering the potential cumulative effect of all WTG located within 2,500 m from NSR. For the currently layout, noise levels less than 45 may be possible when</li> </ul>	Holder of EA/Contractor	Reduction in Noise and thus reduction in chance of complaints arising.  Noise and lighting managed according to approved Method Statement	Semi-continuous measurements conducted over a period of at least 48 hours, covering at



IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	<p>relocating WTG T9, T12 and T28 further than 2,500m from all verified NSR; or</p> <ul style="list-style-type: none"> <li>The applicant can develop a noise abatement program to reduce the noise emission levels (the applicant must select an WTG that offer a reduced noise emission mode during the planning stage) at certain wind speeds, and/or if the wind blows in a certain direction for a number of WTG (WTG within approximately 2,500m from NSR). The applicant should consider the potential reduction in power generation capacity of WTG operating in a reduced noise mode.</li> </ul>		Ensure the EMPr is adhered to.	least a full day (06:00 – 22:00) and two full night-time (22:00 – 06:00)

## Noise

### Decommissioning Phase Specific Mitigations:

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<b>Noise impacts during the day:</b> Decommissioning activities	<ol style="list-style-type: none"> <li>Decommissioning activities normally are limited to the daytime period, due to the lower urgency to complete this phase; and</li> <li>Decommissioning activities normally use smaller and less equipment, generating less noise than the typical construction or operational phases.</li> </ol>	Holder of EA/Contractor	As per SANS 10103:2008	<p>Reduction in Noise and thus reduction in chance of complaints arising.</p> <p>Noise and lighting managed according to approved Method Statement</p>	Semi-continuous measurements conducted over a period of at least 48 hours, covering at least a full day (06:00 – 22:00) and two

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	METHOD	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
				Ensure the EMPr is adhered to.	full night-time (22:00 – 06:00)
<b>Noise impacts at night:</b> Decommissioning activities	<ol style="list-style-type: none"> <li>Decommissioning activities normally are limited to the daytime period, due to the lower urgency to complete this phase; and</li> <li>Decommissioning activities normally use smaller and less equipment, generating less noise than the typical construction or operational phases</li> </ol>	Holder of EA/Contractor	As per SANS 10103:2008	<p>Reduction in Noise and thus reduction in chance of complaints arising.</p> <p>Noise and lighting managed according to approved Method Statement</p> <p>Ensure the EMPr is adhered to.</p>	Semi-continuous measurements conducted over a period of at least 48 hours, covering at least a full day (06:00 – 22:00) and two full night-time (22:00 – 06:00)

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<b>Noise impacts during the day:</b> Decommissioning activities	<ul style="list-style-type: none"> <li>Decommissioning activities normally are limited to the daytime period, due to the lower urgency to complete this phase; and</li> <li>Decommissioning activities normally use smaller and less equipment, generating less noise than the typical construction or operational phases.</li> </ul>	Holder of EA/Contractor	<p>Reduction in Noise and thus reduction in chance of complaints arising.</p> <p>Noise and lighting managed according to approved Method Statement</p>	Semi-continuous measurements conducted over a period of at least 48 hours, covering at least a full day (06:00 – 22:00)

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
			Ensure the EMPr is adhered to.	and two full night-time (22:00 – 06:00)
<b>Noise impacts during the night:</b> Decommissioning activities	<ul style="list-style-type: none"> <li>Decommissioning activities normally are limited to the daytime period, due to the lower urgency to complete this phase; and</li> <li>Decommissioning activities normally use smaller and less equipment, generating less noise than the typical construction or operational phases</li> </ul>	Holder of EA/Contractor	Reduction in Noise and thus reduction in chance of complaints arising.  Noise and lighting managed according to approved Method Statement  Ensure the EMPr is adhered to.	Semi-continuous measurements conducted over a period of at least 48 hours, covering at least a full day (06:00 – 22:00) and two full night-time (22:00 – 06:00)

## Social

### Pre-application Phase Specific Mitigations:

None.

## Social

### Construction Phase Specific Mitigations:

<u>IMPACT</u>	<u>IMPACT MANAGEMENT ACTIONS</u>	<u>RESPONSIBILITY</u>	<u>IMPACT MANAGEMENT OUTCOMES</u>	<u>TIMEFRAMES</u>
<b>Increased spread of disease</b>  The spread of disease can be increased by additional individuals, e.g. contractors' staff, in the study area. As a result of a lack of previous exposure, newcomers to the area may carry respiratory disease strains to which the local population is unable to respond. There is also the possibility of increased spread of sexually	1. People with flu or COVID 19 should stay home. Before the project begins, all construction workers should take an HIV/AIDS awareness course. Information on general hygiene, HIV/AIDS, and STDs should be readily available.	Holder of the EA/Contractor	Ensure the EMPr is adhered to.	Throughout Construction

<b><u>IMPACT</u></b>	<b><u>IMPACT MANAGEMENT ACTIONS</u></b>	<b><u>RESPONSIBILITY</u></b>	<b><u>IMPACT MANAGEMENT OUTCOMES</u></b>	<b><u>TIMEFRAMES</u></b>
transmitted diseases such as HIV/AIDS and others				
<b>Increased criminal activity.</b>  During construction, there will be contractors and job seekers in the area. Contractors and employees will have to cross private property to get to the site, which could attract criminals. Contractors are not the security risk, but it is unemployed job seekers who will have easier access to the site. This is, however, a low probability because there are very few landowners in the area.	1. All Mainstream employees and subcontractors should be easily identifiable. Mainstream and/or its contractors must work with farmers to establish access protocols for private land. Before entering affected land, landowners should be consulted. Construction sites should have security. Access to farms where construction is taking place should be controlled.	Holder of the EA/Contractor	Ensure the EMPr is adhered to.	Throughout Construction
<b>Increased pressure on existing infrastructure and services.</b>	1. Educate construction workers on the importance of conserving water resources. Ensure regular communication with the local municipalities to			

<u>IMPACT</u>	<u>IMPACT MANAGEMENT ACTIONS</u>	<u>RESPONSIBILITY</u>	<u>IMPACT MANAGEMENT OUTCOMES</u>	<u>TIMEFRAMES</u>
For either of the two projects, no construction camps will be used. The contractors will be housed in a variety of town guesthouses. The populations in the study areas are small. Contractors who stay in town may put additional strain on existing infrastructure and services. The impact on water resources may be the most important, as drought is a major issue in the area. More frequent use may also have an impact on access roads, sanitation, and waste removal.	ensure pressure is not being exerted on local infrastructure.			
<b>Tension/competition between newcomers and local residents/communities.</b>  Some of the contractor's (mostly semi- and highly skilled) employees may	2. When possible, the recruitment process should favour local job seekers. Clearly communicate the intention to hire locals first to discourage jobseekers from other areas. Involve local community structures (e.g. ward councillors and/or ward committees) to help communicate and identify local labour resources.	Holder of the EA/Contractor	Ensure the EMPr is adhered to.	Throughout Construction

<u>IMPACT</u>	<u>IMPACT MANAGEMENT ACTIONS</u>	<u>RESPONSIBILITY</u>	<u>IMPACT MANAGEMENT OUTCOMES</u>	<u>TIMEFRAMES</u>
be from outside the DM. Locals' perception that outsiders take jobs from unemployed locals causes tension. High unemployment in the study area increases this impact's likelihood				
<b>Increased fire hazard</b>  An increase in human presence during construction may increase the risk of veld fires. These dangers could be caused by open fires used for cooking and warmth, cigarettes, the burning of fire breaks, and the use of flammable liquids. Uncontrolled fires in project areas could cause neighbouring landowners to lose infrastructure, grazing land, crops, or livestock	1. No open fires allowed.  2. Construction sites and vehicles should have firefighting equipment.	Holder of the EA/Contractor	Ensure the EMPr is adhered to.	Throughout Construction

<b><u>IMPACT</u></b>	<b><u>IMPACT MANAGEMENT ACTIONS</u></b>	<b><u>RESPONSIBILITY</u></b>	<b><u>IMPACT MANAGEMENT OUTCOMES</u></b>	<b><u>TIMEFRAMES</u></b>
<p><b>Reduced safety in and around the project areas.</b></p> <p>Non-project workers, such as farm labourers, could wander onto the construction site and stockpiles without PPE and knowledge of the dangers. Due to increased traffic volumes and the presence of heavy motor vehicles (HMs), the transportation of construction materials and machinery on roads used by private motorists poses a safety risk. however, this is unlikely due to the sparse population.</p>	<p>3. The contractor should brief farmers' workers on project safety risks. If possible, fence off stockpiles. Enforce strict speed limits. All on-site and material-transporting vehicles should be roadworthy. High-danger areas should have road and warning signs.</p>	<p>Holder of the EA/Contractor</p>	<p>Ensure the EMPr is adhered to.</p>	<p>Throughout Construction</p>
<p><b>Site specific social sensitivities</b></p> <p>Property owners and land users on neighbouring properties may</p>	<p>4. Establish communication protocols to manage Mainstream, landowners, and contractors during construction. Appropriate mitigation measures are implemented to mitigate biophysical, visual, and cultural heritage impacts, per the EIA for the</p>	<p>Holder of the EA/Contractor</p>	<p>Ensure the EMPr is adhered to.</p>	<p>Throughout Construction</p>



<u>IMPACT</u>	<u>IMPACT MANAGEMENT ACTIONS</u>	<u>RESPONSIBILITY</u>	<u>IMPACT MANAGEMENT OUTCOMES</u>	<u>TIMEFRAMES</u>
experience direct or indirect impacts differently. Construction causes noise and visual changes, for example. These activities could affect "Sense of place," the identity and character of a landscape felt by locals and visitors (e.g. farmer, tourists, and community members). This attribute is derived from the natural environment, a mix of natural and cultural landscape features, and the people who live there.	proposed project. Ensure a clean site during construction and operation to reduce the project's impact on the area's character.			
<b>Increased employment opportunities</b>  During construction, the project will create direct and indirect jobs. When this report was written, it wasn't known how many	5. Mainstream and its contractors should be required to hire locals during construction. When possible, promote labour-intensive construction. Mainstream should consult the local DOL and neighbouring businesses to see if they will share their skills registers/databases with the Project, especially if any employees have been laid off. Recruitment during the construction phase should be	Holder of the EA/Contractor	Ensure the EMPr is adhered to.	Throughout Construction

<u>IMPACT</u>	<u>IMPACT MANAGEMENT ACTIONS</u>	<u>RESPONSIBILITY</u>	<u>IMPACT MANAGEMENT OUTCOMES</u>	<u>TIMEFRAMES</u>
jobs the proposed development would create. Although limited, new employment opportunities may be significant in study areas with small populations. These are temporary, unskilled jobs (which will be available for members of local communities). The proposed project may also create indirect informal sector jobs, such as food stalls for construction workers. Due to high unemployment, any formal employment, even for a short time, will likely be beneficial.	coordinated through the local DoL or institutions recommended by local authorities (if applicable). Recruitment procedures must be fair and transparent and follow Mainstream's labour and procurement policies. A monitoring system should ensure contractors follow local employment policy. Local contract/temporary workers should be given reference letters after construction is complete. On-the-job training should be certified			
<b>Increased opportunities for local SMEs</b>  Local SMEs providing transport, security, accommodation, catering, etc. may have	6. If subcontractors are appointed, the project should give preference to subcontractors/SMEs in the surrounding communities (Ward 1 & 6), then in the DM, and then outside the province. Construction contractors should monitor their procurement practises and prefer local suppliers. When non-local service providers are awarded contracts,	Holder of the EA/Contractor	Ensure the EMPr is adhered to.	Throughout Construction

<u>IMPACT</u>	<u>IMPACT MANAGEMENT ACTIONS</u>	<u>RESPONSIBILITY</u>	<u>IMPACT MANAGEMENT OUTCOMES</u>	<u>TIMEFRAMES</u>
more opportunities. Such opportunities will lead to secondary multiplier effects like more employment and disposable income.	contractors must show they tried to find a local provider.			
<b>Potential loss of revenue to tourism and ecotourism operations</b>  The construction of the project will most likely degrade the scenery that has made the area popular among hikers, birders, and other outdoor enthusiasts. Tourism revenue generated by these visitors in the form of lodging and food may be reduced as a result of changes to the local flora and fauna and/or the visual landscape.	7. Visual and aesthetic impacts are subjective and considered most significant when the development is different from others or its surroundings. Large electrical infrastructure elements are visually intrusive. However, mitigating measures should be used. A separate flora & fauna and visual Assessment studies will determine mitigation that should be considered.	Holder of the EA/Contractor	Ensure the EMPr is adhered to.	Throughout Construction

<b><u>IMPACT</u></b>	<b><u>IMPACT MANAGEMENT ACTIONS</u></b>	<b><u>RESPONSIBILITY</u></b>	<b><u>IMPACT MANAGEMENT OUTCOMES</u></b>	<b><u>TIMEFRAMES</u></b>
<p><b>Unintended damages to private property</b></p> <p>Due to vibrations and ground instability, construction equipment like heavy-duty vehicles can damage nearby properties. Abnormally heavy vehicles can damage farm roads, fences, and gates. Littering during construction could damage farmland and harm domestic and game animals.</p>	<p>8. Close communication with farm managers. Establish protocols and/or communication channels to access farms and reduce damage. Photograph all affected private property areas. Repair any unintended damage to private property, including fences, immediately. When working between construction areas, leave farm gates as found. Once construction stops each day, the landowner should confirm this where practically possible. If security is compromised by unintended damage to control measures, appropriate security should be provided until repairs are made. If project activities cause damages to private property, the landowner should be notified and compensated where applicable.</p>	<p>Holder of the EA/Contractor</p>	<p>Ensure the EMPr is adhered to.</p>	<p>Throughout Construction</p>

## Social

### Operation Phase Specific Mitigations:

<u>IMPACT</u>	<u>IMPACT MANAGEMENT ACTIONS</u>	<u>RESPONSIBILITY</u>	<u>IMPACT MANAGEMENT OUTCOMES</u>	<u>TIMEFRAMES</u>
<p>Increased socio-economic development associated with more available electricity</p> <p>The WEF when completed provides part of the solutions for the current electricity shortages and the increasing demand for energy, as well as the need to find more sustainable and environmentally friendly energy resources. The additional clean energy can contribute to sustainable socio-economic development in South Africa.</p>	<p>1. Engage government planning departments to prioritise households with electricity backlogs. Continuous communication with municipal and district spatial planning departments.</p>	<p>Holder of the EA/Contractor</p>	<p>Ensure the EMPr is adhered to.</p>	<p>Throughout Operation</p>
<p>Reduced property values</p>	<p>1. In the event of property prices being significantly reduced, affected landowners should be consulted with regard to the value of compensation.</p>	<p>Holder of the EA/Contractor</p>	<p>Ensure the EMPr is adhered to.</p>	<p>Throughout Operation</p>

<b><u>IMPACT</u></b>	<b><u>IMPACT MANAGEMENT ACTIONS</u></b>	<b><u>RESPONSIBILITY</u></b>	<b><u>IMPACT MANAGEMENT OUTCOMES</u></b>	<b><u>TIMEFRAMES</u></b>
The proposed WEF may lower farm property values directly and indirectly. This may be due to the WEF's appearance and infrastructure within the natural environment. It also hinders the owner's ability to market the land for hiking, bird watching, and other activities.	Mainstream must ensure that the value of compensation is agreed by all parties.			
Unintended damages to private property.  Littering may occur during maintenance, which could damage farmland or harm domestic and game animals. Farm gates may be left open, allowing animals to escape. Stray animals are valuable assets and rounding them	1. Mitigation to be applied as described in the construction phase.	Holder of the EA/Contractor	Ensure the EMPr is adhered to.	Throughout Operation

<b><u>IMPACT</u></b>	<b><u>IMPACT MANAGEMENT ACTIONS</u></b>	<b><u>RESPONSIBILITY</u></b>	<b><u>IMPACT MANAGEMENT OUTCOMES</u></b>	<b><u>TIMEFRAMES</u></b>
up is inconvenient and may stress the animals.				
<p>Site specific social sensitivities.</p> <p>Similarly, to the impact described earlier, property owners and land users on surrounding properties may experience direct or indirect impacts differently on their specific properties during the operational phase as well, Therefore, the following impacts on surrounding landowners need to be taken into account</p>	1. Mitigation to be applied as described in the construction phase.	Holder of the EA/Contractor	Ensure the EMPr is adhered to.	Throughout Operation

## Surface Water

### Planning Mitigations

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<b>Aspect: Protection of Riparian and Alluvial Systems</b>	<ol style="list-style-type: none"> <li>1. A detailed monitoring plan must be developed in the pre-construction phase by an aquatic specialist, where any delineated system occurs within 50 m of existing crossings.</li> <li>2. A detailed stormwater management plan and Aquatic Rehabilitation and Monitoring must be developed in the preconstruction phase, detailing the stormwater structures and management interventions that must be installed to manage the increase of surface water flows directly into any natural systems.</li> </ol>	Aquatic Specialist	Protection of drainage and ecosystem services	Once off
<b>Aspect: Protection of soil resources Erosion</b>	<ol style="list-style-type: none"> <li>3. Design an effective system of stormwater run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points, and it must prevent any potential down slope erosion. This is included in the stormwater management plan.</li> </ol>	Holder of the EA Engineer/Contractor	That disturbance and existence of hard surfaces causes no erosion on or downstream of the site.	Once-off during the design phase.
<b>Aspect: Protection of species of special concern and terrestrial habitats</b>	<ol style="list-style-type: none"> <li>4. Develop and implement a Rehabilitation and Monitoring plan post Environmental Authorisation. This plan should include relocation of suitable plant species, but more importantly protect any topsoil stores and promote the collection of vegetative material and propagules / seed to assist with the revegetation of the site.</li> </ol>			



## Surface Water

### Construction Phase Specific Mitigations:

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
<p><b>Loss of aquatic species of special concern</b></p> <p>The construction activities will result in the disturbance of aquatic habitats that may contain listed and or protected plant or animal species. However, none of these were observed during this assessment within the buildable areas proposed.</p>	<ol style="list-style-type: none"> <li>1. Develop and implementation of a Rehabilitation and Monitoring plan post Environmental Authorisation. This must be developed following the finalisation of the turbine / road layout and a walk down has been completed. This plan should include relocation of suitable plant species, but more important protect any topsoil stores and promote the collection of vegetative material and propagules / seed to assist with the revegetation of the site, if and where possible.</li> <li>2. Rapid regeneration of plant cover must be encouraged by setting aside topsoil during earthmoving and replacing onto areas where the re- establishment of plant cover is desirable to prevent erosion.</li> </ol>	Holder of the EA	<p>Impacts avoided or managed as per specialist recommendations.</p> <p>Ensure the conditions of the EA are adhered to.</p>	Throughout Construction
<p><b>Damage or loss of riparian and alluvial systems in the construction phase:</b></p> <p>Construction could result in the loss of drainage systems that are fully functional and provide</p>	<ol style="list-style-type: none"> <li>1. Development of a detailed stormwater management plan and Aquatic Rehabilitation and Monitoring plan, prior to construction.</li> <li>2. All alien plant re-growth, which is currently low within the greater region must be monitored and should it occur, these plants must be eradicated within the project footprints and especially in areas</li> </ol>	Holder of the EA	Impacts avoided or managed as per specialist recommendations.	Throughout Construction

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
ecosystem services within the site especially where new access roads are required or road upgrades will widen any current bridges or drifts. Loss can also include a functional loss, through change in vegetation type via alien encroachment for example.	<p>near the proposed crossings. Where roads and crossings are upgraded, the following applies:</p> <ol style="list-style-type: none"> <li>Existing pipe culverts must be removed and replaced with suitable sized box culverts, especially where road levels are raised to accommodate any large vehicles.</li> <li>River levels, regardless of the current state of the river / water course, must be reinstated thus preventing any impoundments from being formed.</li> <li>Where large cut and fill areas are required these must be stabilised and rehabilitated during the construction process, to minimise erosion and sedimentation.</li> <li>Suitable stormwater management systems must be installed along roads and other areas and monitored during the first few months of use during the construction phase. Any erosion / sedimentation must be resolved through whatever additional interventions maybe necessary (i.e., extension, energy dissipaters, spreaders, etc).</li> <li>A detailed monitoring plan must be developed in the pre-construction phase by an aquatic specialist, where any delineated system occurs within 50 m of existing crossings</li> </ol>		Ensure the conditions of the EA are adhered to.	
<b>Potential impact on localised surface water quality (construction materials and fuel</b>	<ol style="list-style-type: none"> <li>All liquid chemicals including fuels and oil, including the BESS must be stored in with secondary containment (bunds or containers or berms) that can contain a leak or spill. Such facilities must be</li> </ol>	Holder of the EA	Impacts avoided or managed as per specialist	Throughout Construction

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
<p><b>storage facilities) during the construction and decommissioning phases:</b></p> <p>During construction earthworks will expose and mobilise earth materials, and a number of materials as well as chemicals will be imported and used on site and may end up in the surface water, including soaps, oils, grease and fuels, human wastes, cementitious wastes, paints and solvents, etc. Any spills during transport or while works area conducted in proximity to a watercourse has the potential to affect the surrounding biota. Leaks or spills from storage facilities also pose a risk and due consideration to the safe design and</p>	<p>inspected routinely and must have the suitable PPE and spill kits needed to contain likely worst-case scenario leak or spill in that facility, safely.</p> <ol style="list-style-type: none"> <li>2. Washing and cleaning of equipment must be done in designated wash bays, where rinse water is contained in evaporation/sedimentation ponds (to capture oils, grease cement and sediment).</li> <li>3. Mechanical plant and bowzers must not be refuelled or serviced within 100m of a river channel.</li> <li>4. All construction camps, lay down areas, wash bays, batching plants or areas and any stores should be more than 50 m from any demarcated water courses.</li> <li>5. Littering and contamination associated with construction activity must be avoided through effective construction camp management.</li> <li>6. No stockpiling should take place within or near a water course.</li> <li>7. stockpiles must be protected and located in flat areas where run-off will be minimised, and sediment is recoverable.</li> </ol>		<p>recommendations.</p> <p>Ensure the conditions of the EA are adhered to.</p>	

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/ FREQUENCY
management of the storage facility must be given. Although unlikely, consideration must also be provided for the proposed BESS, with regard safe handling during the construction phase. This to avoid any spills or leaks from this system				

### Surface Water

#### Operation Phase Specific Mitigations:

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<b>Impact on aquatic systems through the possible increase in surface water runoff on form and function during the operational phase:</b>	<ol style="list-style-type: none"> <li>1. A detailed stormwater management plan must be developed in the preconstruction phase, detailing the stormwater structures and management interventions that must be installed to manage the increase of surface water flows directly into any natural systems.</li> <li>2. The stormwater control systems must be inspected on an annual basis to ensure these are functional.</li> </ol>	Holder of the EA/Contractor	Construction Monitoring and audit reports	Throughout Operation

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<p>Increase in hard surface areas, and roads that require stormwater management will increase through the concentration of surface water flows that could result in localised changes to flows (volume) that would result in form and function changes within aquatic systems, which are currently ephemeral. This then increases the rate of erosion and sedimentation of downstream areas.</p>	<p>3. Effective stormwater management must include effective stabilisation (gabions and Reno mattresses) of exposed soil and the re-vegetation of any disturbed riverbanks as and where necessary.</p>			

## Surface Water

### Decommissioning Phase Specific Mitigations:

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/FREQUENCY
<p><b>Loss of aquatic species of special concern</b></p> <p>The decommissioning activities will result in the disturbance of aquatic habitats that may contain listed and or protected plant or animal species. However, none of these were observed during this assessment within the buildable areas proposed</p>	<ol style="list-style-type: none"> <li>1. Develop and implementation of a Rehabilitation and Monitoring plan post Environmental Authorisation. This must be developed following the finalisation of the turbine / road layout and a walk down has been completed. This plan should include relocation of suitable plant species, but more important protect any topsoil stores and promote the collection of vegetative material and propagules / seed to assist with the revegetation of the site, if and where possible.</li> <li>2. Rapid regeneration of plant cover must be encouraged by setting aside topsoil during earthmoving and replacing onto areas where the re- establishment of plant cover is desirable to prevent erosion.</li> </ol>	Holder of the EA	<p>Impacts avoided or managed as per specialist recommendations.</p> <p>Ensure the conditions of the EA are adhered to.</p>	Throughout Decommissioning
<p><b>Damage or loss of riparian and alluvial systems in the decommissioning phase:</b></p> <p>Decommissioning could result in the loss of drainage systems that are fully functional and provide ecosystem services within the site</p>	<ol style="list-style-type: none"> <li>1. Development of a detailed stormwater management plan and Aquatic Rehabilitation and Monitoring plan, prior to construction.</li> <li>2. All alien plant re-growth, which is currently low within the greater region must be monitored and should it occur, these plants must be eradicated within the project footprints and especially in areas near the proposed crossings. Where roads</li> </ol>	Holder of the EA	<p>Impacts avoided or managed as per specialist recommendations.</p> <p>Ensure the conditions of the EA are adhered to.</p>	Throughout Decommissioning

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/FREQUENCY
<p>especially where new access roads are required, or road upgrades will widen any current bridges or drifts. Loss can also include a functional loss, through change in vegetation type via alien encroachment for example.</p>	<p>and crossings are upgraded, the following applies:</p> <ol style="list-style-type: none"> <li>Existing pipe culverts must be removed and replaced with suitable sized box culverts, especially where road levels are raised to accommodate any large vehicles.</li> <li>River levels, regardless of the current state of the river / water course, must be reinstated thus preventing any impoundments from being formed. The related designs must be assessed by an aquatic specialist prior to construction.</li> <li>Where large cut and fill areas are required, these must be stabilised and rehabilitated during the construction process, to minimise erosion and sedimentation.</li> <li>Suitable stormwater management systems must be installed along roads and other areas and monitored during the first few months of use during the construction phase. Any erosion / sedimentation must be resolved through whatever additional interventions maybe necessary (i.e., extension, energy dissipaters, spreaders, etc).</li> <li>A detailed monitoring plan must be developed in the pre-construction phase by an aquatic specialist, where any delineated system occurs within 50 m of existing crossings.</li> </ol>			

ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/FREQUENCY
<p><b>Potential impact on localised surface water quality (construction materials and fuel storage facilities) during the construction and decommissioning phases</b></p> <p>During construction earthworks will expose and mobilise earth materials, and a number of materials as well as chemicals will be imported and used on site and may end up in the surface water, including soaps, oils, grease and fuels, human wastes, cementitious wastes, paints and solvents, etc. Any spills during transport or while works area conducted in proximity to a watercourse has the potential to affect the surrounding biota. Leaks or spills from storage facilities also pose a risk and due consideration to the safe design and management of the</p>	<ol style="list-style-type: none"> <li>1. All liquid chemicals including fuels and oil, including the BESS must be stored in with secondary containment (bunds or containers or berms) that can contain a leak or spill. Such facilities must be inspected routinely and must have the suitable PPE and spill kits needed to contain likely worst-case scenario leak or spill in that facility, safely.</li> <li>2. Washing and cleaning of equipment must be done in designated wash bays, where rinse water is contained in evaporation/sedimentation ponds (to capture oils, grease cement and sediment).</li> <li>3. Mechanical plant and bowzers must not be refueled or serviced within 100m of a river channel.</li> <li>4. All construction camps, lay down areas, wash bays, batching plants or areas and any stores should be more than 50 m from any demarcated water courses.</li> <li>5. Littering and contamination associated with construction activity must be avoided through effective construction camp management; No stockpiling should take place within or near a water course. All stockpiles must be protected and located in flat areas where run-off will be minimised, and sediment is recoverable.</li> </ol>	Holder of the EA	<p>Impacts avoided or managed as per specialist recommendations.</p> <p>Ensure the conditions of the EA are adhered to.</p>	Throughout Decommissioning



ASPECT/ IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES/FREQUENCY
storage facility must be given. Although unlikely, consideration must also be provided for the proposed BESS, with regard safe handling during the construction phase. This to avoid any spills or leaks from this system.				

## Transportation

### Pre-application Phase Specific Mitigations:

None

## Transportation

### Construction Phase Specific Mitigations:

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
Additional Traffic Generation: <b>Increase in Traffic</b>	<ol style="list-style-type: none"><li>1. Ensure staff transport is done in the 'off peak' periods and by bus.</li><li>2. Stagger material, component and abnormal loads</li><li>3. Construction of an on-site concrete batching plant to reduce trips.</li></ol>	Holder of the EA/Contractor	All staff members are aware of the EMPr requirements relevant to them  Ensure the EMPr is adhered to.	Throughout Construction
Additional Traffic Generation: <b>Increase of Incidents with pedestrians and livestock</b>	<ol style="list-style-type: none"><li>1. Upgrade of existing / new access points</li><li>2. Reduction in speed of vehicles</li><li>3. Adequate enforcement of the law</li><li>4. Implementation of pedestrian safety initiatives</li><li>5. Regular maintenance of farm fences &amp; access cattle grids</li><li>6. Construction of an on-site concrete batching plant to reduce trips.</li></ol>	Holder of the EA/Contractor	All staff members are aware of the EMPr requirements relevant to them  Ensure the EMPr is adhered to.	Throughout Construction

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
Additional Traffic Generation: <b>Increase in Dust from gravel roads</b>	<ol style="list-style-type: none"> <li>1. Upgrade of existing / new access point</li> <li>2. Reduction in speed of the vehicles</li> <li>3. Construction of gravel roads in terms of TRH20</li> <li>3. Implement a road maintenance program under the auspices of the respective transport department.</li> <li>4. Possible use of an approved dust suppressant techniques</li> <li>5. Construction of an on-site batching plant and tower construction to reduce trips</li> </ol>	Holder of the EA/Contractor	<p>All staff members are aware of the EMPr requirements relevant to them</p> <p>Ensure the EMPr is adhered to.</p>	Throughout Construction
Additional Traffic Generation: <b>Increase in Road Maintenance</b>	<ol style="list-style-type: none"> <li>1. Implement a road maintenance program under the auspices of the respective transport department.</li> <li>2. Construction of an on-site batching plant to reduce trips.</li> </ol>	Holder of the EA/Contractor	<p>All staff members are aware of the EMPr requirements relevant to them</p> <p>Ensure the EMPr is adhered to.</p>	Throughout Construction
Additional Abnormal Loads	<ol style="list-style-type: none"> <li>1. Ensure abnormal vehicles travel to and from the proposed development in the 'off peak' periods or stagger delivery.</li> <li>2. Adequate enforcement of the law</li> </ol>	Holder of the EA/Contractor	<p>All staff members are aware of the EMPr requirements relevant to them</p> <p>Ensure the EMPr is adhered to.</p>	Throughout Construction
Internal Access Roads: <b>Increase in Dust from gravel roads</b>	<ol style="list-style-type: none"> <li>1. Enforce a maximum speed limit on the development</li> <li>2. Appropriate, timely and high quality maintenance required in terms of TRH20</li> </ol>	Holder of the EA/Contractor	All staff members are aware of the EMPr requirements relevant to them	Throughout Construction

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	3. Possible use of an approved dust suppressant techniques		Ensure the EMPr is adhered to.	
Internal Access Roads: <b>New / Larger Access points</b>	1. Adequate road signage according to the SARTSM 2. Approval from the respective roads department	Holder of the EA/Contractor	All staff members are aware of the EMPr requirements relevant to them  Ensure the EMPr is adhered to.	Throughout Construction

### Transportation

#### Operation Phase Specific Mitigations:

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
Additional Traffic Generation: <b>Increase in Traffic</b>	1. The increase in traffic for this phase of the development is negligible and will not have a significant impact	Holder of the EA/Contractor	All staff members are aware of the EMPr requirements relevant to them  Ensure the EMPr is adhered to.	Throughout Operation
Additional Traffic Generation: <b>Increase of Incidents with pedestrians and livestock</b>	2. The increase in traffic for this phase of the development is negligible and will not have a significant impact	Holder of the EA/Contractor	All staff members are aware of the EMPr requirements relevant to them	Throughout Operation

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
			Ensure the EMPr is adhered to.	
Additional Traffic Generation: <b>Increase in Dust from gravel roads</b>	3. The increase in traffic for this phase of the development is negligible and will not have a significant impact	Holder of the EA/Contractor	All staff members are aware of the EMPr requirements relevant to them  Ensure the EMPr is adhered to.	Throughout Operation
Additional Traffic Generation: <b>Increase in Road Maintenance</b>	4. The increase in traffic for this phase of the development is negligible and will not have a significant impact	Holder of the EA/Contractor	All staff members are aware of the EMPr requirements relevant to them  Ensure the EMPr is adhered to.	Throughout Operation
Additional Abnormal Loads	5. The increase in traffic for this phase of the development is negligible and will not have a significant impact	Holder of the EA/Contractor	All staff members are aware of the EMPr requirements relevant to them  Ensure the EMPr is adhered to.	Throughout Operation
Internal Access Roads: <b>New / Larger Access points</b>	6. Adequate road signage according to the SARTSM.	Holder of the EA/Contractor	All staff members are aware of the EMPr requirements relevant to them	Throughout Operation

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
			Ensure the EMPr is adhered to.	

### Transportation

#### Decommissioning Phase Specific Mitigations:

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
Additional Traffic Generation: <b>Increase in Traffic</b>	<ol style="list-style-type: none"> <li>1. Ensure staff transport is done in the 'off peak' periods and by bus.</li> <li>2. Stagger material, component and abnormal loads.</li> </ol>	Holder of the EA/Contractor	<p>All staff members are aware of the EMPr requirements relevant to them</p> <p>Ensure the EMPr is adhered to.</p>	Throughout Decommissioning
Additional Traffic Generation: <b>Increase of Incidents with pedestrians and livestock</b>	<ol style="list-style-type: none"> <li>1. Reduction in speed of vehicles</li> <li>2. Adequate enforcement of the law</li> <li>3. Implementation of pedestrian safety initiatives</li> <li>4. Regular maintenance of farm fences &amp; access cattle grids.</li> </ol>	Holder of the EA/Contractor	<p>All staff members are aware of the EMPr requirements relevant to them</p> <p>Ensure the EMPr is adhered to.</p>	Throughout Decommissioning
Additional Traffic Generation: <b>Increase in Dust from gravel roads</b>	<ol style="list-style-type: none"> <li>1. Reduction in speed of the vehicles</li> <li>2. Appropriate, timely and high quality maintenance required in terms of TRH20</li> <li>3. Possible use of an approved dust suppressant techniques</li> <li>4. Implement a road maintenance program under the auspices of the respective transport department.</li> </ol>	Holder of the EA/Contractor	<p>All staff members are aware of the EMPr requirements relevant to them</p> <p>Ensure the EMPr is adhered to.</p>	Throughout Decommissioning

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	5. Construction of an on-site batching plant and tower construction to reduce trips.			
Additional Traffic Generation: <b>Increase in Road Maintenance</b>	1. Implement a road maintenance program under the auspices of the respective transport department.	Holder of the EA/Contractor	All staff members are aware of the EMPr requirements relevant to them  Ensure the EMPr is adhered to.	Throughout Decommissioning
Additional Abnormal Loads	1. Ensure abnormal vehicles travel to and from the proposed development in the 'off peak' periods or stagger delivery. 2. Adequate enforcement of the law	Holder of the EA/Contractor	All staff members are aware of the EMPr requirements relevant to them  Ensure the EMPr is adhered to.	Throughout Decommissioning
Internal Access Roads: <b>Increase in Dust from gravel roads</b>	1. Enforce a maximum speed limit on the development 2. Appropriate, timely and high quality maintenance required in terms of TRH20 3. Possible use of an approved dust suppressant techniques	Holder of the EA/Contractor	All staff members are aware of the EMPr requirements relevant to them  Ensure the EMPr is adhered to.	Throughout Decommissioning
Internal Access Roads: <b>New / Larger Access points</b>	1. Adequate road signage according to the SARTSM 2. Approval from the respective roads department	Holder of the EA/Contractor	All staff members are aware of the EMPr requirements relevant to them  Ensure the EMPr is adhered to.	Throughout Decommissioning

## Visual

### Pre-Construction Phase Specific Mitigations:

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
Potential alteration of the visual character and sense of place.  Potential visual impact on receptors in the study area.  Potential visual impact on the night time visual environment.	<ol style="list-style-type: none"><li>1. Where possible, fewer but larger turbines with a greater output should be utilised rather than a larger number of smaller turbines with a lower capacity.</li><li>2. Where possible, the operation and maintenance buildings and laydown areas should be consolidated to reduce visual clutter.</li><li>3. Where possible, underground cabling should be utilised.</li><li>4. Turbines should not be located within 800m of an occupied building to avoid shadow flicker impacts.</li></ol>	Holder of the EA/Contractor	Reduced visual impact	During Design

## Visual

### Construction Phase Specific Mitigations:

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
Potential alteration of the visual character and sense of place	<ol style="list-style-type: none"><li>1. Carefully plan to minimise the construction period and avoid construction delays.</li><li>2. Inform receptors within 1km of the WEF development area of the construction programme and schedules.</li><li>3. Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.</li></ol>	Holder of the EA/ Contractor	Ensure the EMPr is adhered to.	Throughout Construction



IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
Potential visual impact on receptors in the study area	<ol style="list-style-type: none"> <li>4. Vegetation clearing should take place in a phased manner.</li> <li>5. Maintain a neat construction site by removing rubble and waste materials regularly.</li> <li>6. Position storage / stockpile areas in unobtrusive positions in the landscape, where possible.</li> <li>7. Where possible, underground cabling should be utilised.</li> <li>8. Make use of existing gravel access roads where possible.</li> <li>9. Limit the number of vehicles and trucks travelling to and from the construction site, where possible.</li> <li>10. Ensure that dust suppression techniques are implemented: <ul style="list-style-type: none"> <li>• on all access roads;</li> <li>• in all areas where vegetation clearing has taken place;</li> <li>• on all soil stockpiles.</li> </ul> </li> </ol>			

## **Visual**

### **Operation Phase Specific Mitigations:**

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
Potential alteration of the visual character and sense of place.	<ol style="list-style-type: none"> <li>1. Turbine colours should adhere to CAA requirements. Bright colours and logos on the turbines should be kept to a minimum.</li> </ol>	Holder of the EA/Contractor	reduced visual intrusion	Throughout Operation

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<p>Potential visual impact on receptors in the study area.</p> <p>Potential visual impact on the night time visual environment.</p>	<ol style="list-style-type: none"> <li>2. Inoperative turbines should be repaired promptly, as they are considered more visually appealing when the blades are rotating (or at work) (Vissering, 2011).</li> <li>3. If turbines need to be replaced for any reason, they should be replaced with the same model, or one of equal height and scale to lessen the visual impact.</li> <li>4. As far as possible, limit the number of maintenance vehicles which are allowed to access the site.</li> <li>5. Ensure that dust suppression techniques are implemented on all gravel internal access roads.</li> <li>6. As far as possible, limit the amount of security and operational lighting present on site.</li> <li>7. Light fittings for security at night should reflect the light toward the ground and prevent light spill.</li> <li>8. Lighting fixtures should make use of minimum lumen or wattage.</li> <li>9. Mounting heights of lighting fixtures should be limited, or alternatively foot-light or bollard level lights should be used.</li> <li>10. If possible, make use of motion detectors on security lighting.</li> <li>11. Where an occupied building is located within 800m of a wind turbine, then the potential for shadow flicker should be assessed.</li> <li>12. Where possible, the operation and maintenance buildings should be consolidated to reduce visual clutter.</li> </ol>			

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
	13. The operations and maintenance (O&M) buildings should not be illuminated externally at night. 14. The O&M buildings should be painted in natural tones that fit with the surrounding environment. 15. Buildings on the substation site should be painted with natural tones that fit with the surrounding environment. 16. Non-reflective surfaces should be utilised where possible .			

### **Visual**

#### **Decommissioning Phase Specific Mitigations:**

IMPACT	IMPACT MANAGEMENT ACTIONS	RESPONSIBILITY	IMPACT MANAGEMENT OUTCOMES	TIMEFRAMES
<p>Potential visual intrusion resulting from vehicles and equipment involved in the decommissioning process;</p> <p>Potential visual impacts of increased dust emissions from decommissioning activities and related traffic; and</p> <p>Potential visual intrusion of any remaining infrastructure on the site.</p>	1. All infrastructure that is not required for post-decommissioning use should be removed. 2. Carefully plan to minimize the decommissioning period and avoid delays. 3. Maintain a neat decommissioning site by removing rubble and waste materials regularly. 4. Ensure that dust suppression procedures are maintained on all gravel access roads throughout the decommissioning phase. 5. All cleared areas should be rehabilitated as soon as possible. 6. Rehabilitated areas should be monitored post-decommissioning and remedial actions implemented as required.	Holder of the EA/ Contractor	reduced visual intrusion	Throughout Decommissioning

**Cumulative impacts:**

- Where possible, limit the number of maintenance vehicles using access roads.
- Non-reflective surfaces should be utilised where possible.
- Where possible, limit the amount of security and operational lighting present at the on-site substation.
- Light fittings for security at night should reflect the light toward the ground and prevent light spill.

## 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.