

**PROPOSED CHABA BATTERY ENERGY STORAGE SYSTEM, KOMGA,  
EASTERN CAPE, SOUTH AFRICA**

**ENVIRONMENTAL MANAGEMENT PROGRAMME**

**Prepared for:**



**Great Kei Wind Power (Pty) Ltd.**

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# 1 INTRODUCTION

## 1.1 OBJECTIVES OF THE EMPR

This EMPr has been compiled to provide recommendations and guidelines according to which compliance monitoring can be done during the construction, operation and decommissioning phases of the Chaba Battery Energy Storage System (BESS) associated with the Chaba and Great Kei Wind Energy Facilities (WEF's) as well as to ensure that all relevant factors are considered to ensure environmentally responsible development.

This EMPr informs all relevant parties, the Project Coordinator, the Contractor, the Environmental Control Officer (ECO) and all other staff, contractors and consultants responsible for the implementation of the BESS at the site as to their duties in the fulfilment of the legal requirements for the construction, operation and decommissioning of the facility with particular reference to the prevention and mitigation of anticipated potential environmental and social impacts.

All parties should note that obligations imposed by the EMPr are legally binding in terms of the environmental authorisation granted by the relevant environmental permitting authority.

The objectives of an EMPr are to:

- Ensure compliance with regulatory authority stipulations and guidelines which may be local, provincial, national and/or international;
- Ensure that there is sufficient allocation of resources on the project budget so that the scale of EMPr-related activities is consistent with the significance of project impacts;
- Verify environmental performance through information on impacts as they occur;
- Respond to unforeseen events;
- Provide feedback for continual improvement in environmental performance;
- Identify a range of mitigation measures which could reduce and mitigate the potential impacts to minimal or insignificant levels;
- Detail specific actions deemed necessary to assist in mitigating the environmental impact of the project;
- Identify measures that could optimize beneficial impacts;
- Create management structures that address the concerns and complaints of I&APs with regards to the development;
- Establish a method of monitoring and auditing environmental management practices during all phases of the activity;
- Ensure that safety recommendations are complied with; and
- Specify time periods within which the measures contemplated in the final EMPr must be implemented, where appropriate.



## 1.2 STRUCTURE AND FUNCTION OF AN EMPR

An EMPr is focused on sound environmental management practices, which must be undertaken to minimise adverse impacts on the environment through the lifetime of a development. In addition, an EMPr identifies what measures must be in place or must be implemented to manage any incidents and emergencies that may occur during operation of the project.

As such the EMPr provides specifications that must be adhered to in order to minimise adverse environmental impacts associated with the construction and operation of the Chaba BESS. The content of the EMPr is consistent with the requirements as set out in Appendix 4 of the EIA regulations stated below, for the construction and operation phases.

**According to APPENDIX 4 of GN R 326, an EMPr must include:**

- (a) Details of –
  - (i) The EAP who prepared the EMPr; and
  - (ii) The expertise of the EAP to prepare an EMPr, including a curriculum vitae;
- (b) A detailed description of the aspects of the activity that are covered by the draft EMPr as identified by the project description;
- (c) A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;
- (d) Information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of –
  - (i) Planning and design;
  - (ii) Pre-construction;
  - (iii) construction activities;
  - (iv) Rehabilitation of the environment after construction and where applicable post closure; and
  - (v) where relevant, operation activities;
- (e) a description and identification of impact outcomes required for the aspects contemplated in (d).
- (f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable include actions to –
  - (i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
  - (ii) Comply with any prescribed environmental management standards or practices;
  - (iii) Comply with any applicable provisions of the Act regarding closure, where applicable;
  - (iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;



- (g) The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);
- (h) The frequency of monitoring the implementation of the impact management actions contemplated in (f);
- (i) An indication of the persons who will be responsible for the implementation of the impact management actions;
- (j) The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;
- (k) The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);
- (l) A program for reporting on compliance, taking into account the requirement as prescribed by the regulations;
- (m) An environmental awareness plan describing the manner in which –
  - (i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and
  - (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment; and
- (n) Any specific information that may be required by the competent authority.

### 1.3 LEGAL REQUIREMENTS

Construction must be according to the best industry practices, as identified in the project documents. This EMP, which forms an integral part of the contract documents, informs the Contractor as to his/her duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. The Contractor should note that obligations imposed by the approved EMP are legally binding in terms of environmental statutory legislation and in terms of the additional conditions to the general conditions of contract that pertain to this project. In the event that any rights and obligations contained in this document contradict those specified in the standard or project specifications then the latter must prevail.

The Contractor must identify and comply with all South African national and provincial environmental legislation, including associated regulations and all local by-laws relevant to the project. Key legislation currently applicable to the construction and operation phases of the project must be complied with. The list of applicable legislation provided below is intended to serve as a guideline only and is not exhaustive:

- Constitution Act (No. 108 of 1996);
- National Environment Management Act (No. 107 of 1998, as amended, NEMA);
- National Environmental Management: Biodiversity Act (No. 10 of 2004; NEMBA);
- Environmental Management: Protected Areas Act (Act No. 57 of 2003; NEMPAA);
- National Water Act (No. 36 of 1998; NWA);
- National Environmental Management: Waste Management Act (No. 59 of 2008; NEMWA);
- Mineral and Petroleum Resources Development Act (MPRDA, Act No. 28 of 2002)



- National Heritage Resources Act (No. 25 of 1999; NHRA);
- Provincial Nature and Environmental Conservation Ordinance (No. 19 of 1974);
- Conservation of Agricultural Resources Act (CARA, Act No. 43 of 1983);
- Informal Land Rights Act (No. 109 of 1996; ILRA);
- National Forestry Act, 1998 (No. 84 of 1998; NFA);
- Occupational Health and Safety Act (OHSA, Act No. 85 of 1993);
- National Environmental Management: Air Quality Act (NEM:AQA, Act No. 39 of 2004);
- National Road Traffic Act (NRTA, Act No. 93 of 1996); and
- National Veld and Forest Fire Act (NVFFA, Act No. 101 of 1998).

Other legislation that may be relevant to the proposed development includes:

- The Environment Conservation Act No 73 of 1989 (ECA) Noise Control Regulations, which specifically provide for regulations to be made with regard to the control of noise, vibration and shock, including prevention, acceptable levels, powers of local authorities and related matters;
- Spatial Planning and Land Use Management Act (SPLUMA) (Act 16 of 2013 – came into force on 1 July 2015) aims to provide inclusive, developmental, equitable and efficient spatial planning at the different spheres of the government. This act repeals national laws on the Removal of Restrictions Act, Physical Planning Act, Less Formal Township Planning Act and Development Facilitation Act;
- Electricity Regulation Act (Act 4 of 2006; ERA);
- Public Finance Management Act (Act 1 of 1999; PFMA);
- Employment Equity Act (Act 55 of 1998; EEA);
- Labour Relations Act (Act 66 of 1995; LRA);

In particular, the following provincial and municipal policies and plans are important:

- District and Local municipality Integrated Development Plans (IDPs) and Spatial Development Frameworks (SDFs).

In addition to the above, the following spatial tools from the South African National Biodiversity Institute (SANBI) need to be taken into consideration:

- The South African Vegetation Map (Mucina and Rutherford);
- The Eastern Cape Biodiversity Conservation Plan; and
- The National Freshwater Ecosystem Priority Areas (NFEPA) project.

## 1.4 APPLICANT DETAILS

**Applicant:** EDF Renewables (Pty) Ltd  
**Company:** EDF Renewables (Pty) Ltd  
**Telephone:** (0)41 506 4900



**Physical Address:** Waterfront Business Park, Building 5, Ground Floor,  
1204 Humerail Road, Humerail, 6001

**Postal Address:** Waterfront Business Park, Building 5, Ground Floor,  
1204 Humerail Road, Humerail, 6001

### 1.5 APPLICANT DECLARATION

The proponent/applicant or holder of the EA affirms that he/she will abide and comply with the prescribed impact management outcomes and impact management actions as stipulated in this EMPr and has 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 Competent Authority (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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## 2 DETAILS AND EXPERTISE OF THE EAP

**According to APPENDIX 4 of GN R 326, an EMPr must include:**

- (a) Details of –
- (i) The EAP who prepared the EMPr; and
  - (ii) The expertise of the EAP to prepare an EMPr, including a curriculum vitae;

<b>EAP:</b>	Dr Alan Carter (Pr.Sci.Nat and registered with EAPSA)
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### 2.1 CES COMPANY PROFILE

CES is a South African based company, with its head office in Grahamstown, and offices in Cape Town, Port Elizabeth, East London and Johannesburg, South Africa, as well as a wholly owned subsidiary in Maputo, Mozambique (CES is registered as an Environmental Practitioner with the Mozambican authorities). CES was established in 1990, to service a then fledgling market in the field of Environmental Management and Impact Assessment. The Company has grown apace with the increased market demand for environmental and social advisory services, in South Africa and numerous other African countries. Our principal area of expertise is in assessing the impacts of development on the natural, social and economic environments through, among other instruments, the environmental impact assessment process, and in so doing contribute towards sustainable development.

Our staffs are currently comprised of 35 professional staff and 12 support staff. All professional staff members are well qualified, and as many as 90% have advanced postgraduate qualifications, including PhD, MSc and MA degrees in the biological, social and environmental sciences. In addition, CES has well-developed working relationships with a number of other individual specialist and specialist consulting companies who provide us with expertise in disciplines such as air quality impact assessments, noise impacts, heritage assessments, radiation hazard assessments, groundwater studies and health impact assessments. We have a demonstrated ability to manage EIAs for large and complex projects. This experience was initially gained during the undertaking of integrated environmental management studies, as well as the management of large and complex environmental and social impact assessments. CES has managed numerous large EIAs from pre-feasibility through to operation for international clients in six southern African countries. These have been rigorously reviewed by parties such as the World Bank, MIGA, European Investment Bank, IFC, German Investment Bank (KfW), African Development Bank, BHP Billiton international peer review team and the Dutch Development Bank (FMO).



## 2.2 PROJECT TEAM

The table below provides details of the project team involved in the preparation of this site specific EMPr. The full curricula vitae of the EAP is provided in Appendix A.

**Table 2-1: CES Project Team**

<p><b>Dr Alan Carter</b> EAP, Project Leader &amp; Quality Control</p>	<p>Alan is the executive of the CES East London Office. He holds a PhD in Marine Biology and is a certified Public Accountant, with extensive training and experience in both financial accounting and environmental science disciplines with international accounting firms in South Africa and the USA. He has 25 years of experience in environmental management and has specialist skills in sanitation, coastal environments and industrial waste. Dr Carter is registered as a Professional Natural Scientist under the South African Council for Natural Scientific Professions (SACNASP). He is also registered as an EAP by the Environmental Assessment Practitioners of South Africa (EAPSA).</p>
<p><b>Ms Caroline Evans</b> Project Manager, Reviewer</p>	<p>Caroline is a Principal Environmental Consultant with more than 6 years' experience and she is based in the Grahamstown branch. She holds a BSc with majors in Environmental Science (distinction) and Zoology, as well as a BSc (Hons) in Environmental Science (distinction) both from Rhodes University. Her undergraduate degree included both commerce and natural sciences. Caroline's honours dissertation evaluated the economic impacts of degradation of the xeric subtropical thicket through farming practices, focusing on the rehabilitation potential of the affected areas in terms of carbon tax. She has a broad academic background including statistics, economics, management, climate change, wetland ecology, GIS, rehabilitation ecology, ecological modelling and zoology. Caroline has a strong focus on renewable energy and South African policy and legislation related to development.</p>
<p><b>Ms Robyn Thomson</b> Report Writer</p>	<p>Robyn holds a BSc (Environmental Science) degree with majors in Archaeology, Environmental and Geographical Science, as well as a BSc (Hons.) in Environmental Science. Robyn has 15 years of experience and expertise in Basic Assessments, Environmental Impact Assessments, Environmental Monitoring, Environmental Management Plans, Water Use Licencing, public participation, GIS and project coordination. Robyn has particularly strong experience in infrastructure projects for various municipal, provincial and national organisations. Robyn is registered as an EAP by the Environmental Assessment Practitioners of South Africa (EAPSA, Interim Certification Board).</p>



### 3 PROJECT DETAILS

According to APPENDIX 4 of GN R 326, an EMPr must include:

- (b) A detailed description of the aspects of the activity that are covered by the draft EMPr as identified by the project description;
- (c) A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers.

#### 3.1 PROJECT DESCRIPTION

Great Kei Wind Power (Pty) Ltd., a subsidiary of EDF Renewables (Pty) Ltd, (the Applicant) is proposing the development of a BESS, associated with the Chaba and Great Kei Wind Energy Facilities (WEF), near Komga in the Great Kei Local Municipality (GKLM) within the Amathole District Municipality (ADM) of the Eastern Cape Province.

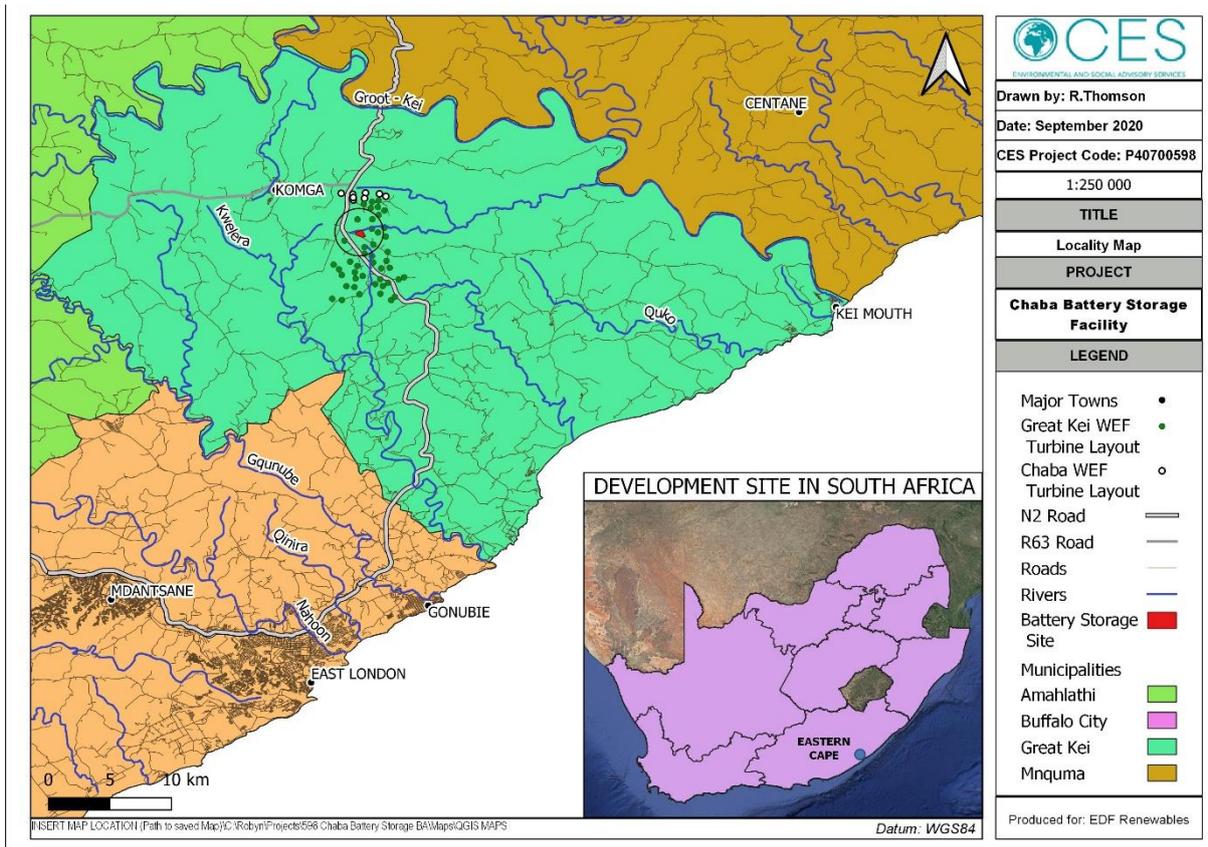


Figure 3-1 Location of the proposed project.

It is proposed that the Chaba BESS will comprise of the following:

- Up to 115 containers (each up to 40m2), each with a capacity of up to 4MWh and on a concrete platform. These will house the batteries, management system and auxiliaries.



- Up to 60 transformer stations (up to 35m<sup>2</sup> each);
- Up to an additional 10m<sup>2</sup> per container for cooling units;
- Internal access roads up to 8m wide between rows of containers (existing roads will be used as far as possible. However, where required, internal access roads will be constructed);
- Medium voltage cabling between containers and the switching station of up to 33kV;
- Up to 33kV underground cables from the BESS to the authorised Great Kei IPP substation which connects to the Chaba substation;
- Temporary infrastructure including a site camp and a laydown area of approximately 0.3ha; and
- In total, the development footprint is expected to be a maximum of 4 ha.

The Chaba BESS will connect to the Eskom Chaba Substation (situated adjacent to the proposed BESS).

### 3.2 ENVIRONMENTAL SENSITIVITIES

During the Basic Assessment Process, the site was classified into areas of low, Moderate and High Sensitivity and No-Go areas were identified.

- **NO-GO** includes areas where no construction should take place.
- **High Sensitivity** areas will require considerable effort to design out, mitigate or manage negative environmental impacts. In many cases this will not be possible and in general these areas should be avoided. Only facilities that are location dependent should be permitted in these areas.
- **Moderate Sensitivity** areas can accommodate development, but there are constraints. Mitigation and management will be required to reduce significant environmental impacts to acceptable levels, and appropriate technology and design will be required to reduce impacts and ensure sustainability.
- **Low Sensitivity** areas can be easily developed, as there are only minor constraints, and little mitigation and management is required (aside from normal building design and construction restrictions outlined in the EMP).

A sensitivity map for the study area was developed based on the methodology presented in Table 3-1 and Table 3-2 below. The shaded boxes in Table 3-2 below indicate the sensitivity criteria which are relevant based on the findings on site.

**Table 3-1: Criteria used for the analysis of the sensitivity of the proposed Chaba BESS.**

Criteria		Low Sensitivity	Moderate Sensitivity	High Sensitivity
1	<b>Topography</b>	Level or even	Undulating; fairly steep slopes	Complex and uneven with steep slopes
2	<b>Vegetation</b> - Extent or habitat type in the region	Extensive	Restricted to a particular region / zone	Restricted to a specific locality / site



Criteria		Low Sensitivity	Moderate Sensitivity	High Sensitivity
3	<b>Conservation status</b> of fauna / flora or habitats	Well conserved independent of conservation value	Not well conserved, moderate conservation value	Not conserved - has a high conservation value
4	<b>Species of special concern</b> - Presence and number	None, although occasional regional endemics	No endangered or vulnerable species, some indeterminate or rare endemics	One or more endangered and vulnerable species, or more than 2 endemics or rare species
5	<b>Habitat fragmentation</b> leading to loss of viable populations	Extensive areas of preferred habitat present elsewhere in region not susceptible to fragmentation	Reasonably extensive areas of preferred habitat elsewhere and habitat susceptible to fragmentation	Limited areas of this habitat, susceptible to fragmentation
6	<b>Biodiversity</b> contribution	Low diversity or species richness	Moderate diversity, and moderately high species richness	High species diversity, complex plant and animal communities
7	<b>Erosion potential</b> or instability of the region	Very stable and an area not subjected to erosion	Some possibility of erosion or change due to episodic events	Large possibility of erosion, change to the site or destruction due to climatic or other factors
8	<b>Rehabilitation</b> potential of the area or region	Site is easily rehabilitated	There is some degree of difficulty in rehabilitation of the site	Site is difficult to rehabilitate due to the terrain, type of habitat or species required to reintroduce
9	<b>Disturbance</b> due to human habitation or other influences (alien invasive species)	Site is very disturbed or degraded	There is some degree of disturbance of the site	The site is hardly or very slightly impacted upon by human disturbance
10	<b>Ecological function</b> in the landscape (corridor, niche habitats)	Low ecological function. No corridors or niche habitats	N/A (There are NO moderate ecological functions. It is considered either high or low)	High ecological function. Portions of entire sections of the site contains corridors or niche habitats
11	<b>Ecological services</b> (food, on site)	Low to no ecological services on site	Some sections of the site contain ecological services	Most of the site contains ecological services



Criteria		Low Sensitivity	Moderate Sensitivity	High Sensitivity
	water filter, grazing, etc.)			
12	<b>Aquatic environments</b> (Rivers, wetlands, drainage line etc)	Outside of the 32m watercourse buffer. Outside of the 500m wetland buffer	Within 32m of the watercourse. Within 500m of a natural wetland, but outside of 50m wetland buffer	Development within the watercourse.

Table 3-2: List of Criteria contributing to the sensitivity map.

Site Element	Sensitivity Mapping Rule	Sensitivity Allocation
<b>Vegetated Areas</b> (Bhisho Thornveld)	<p><b>Topography</b> of the site is gentle, slightly undulating and sloping away from the centre.</p> <p>Possibility of <b>erosion</b> or change due to episodic events.</p> <p>Moderate <b>biodiversity</b> and species richness.</p> <p>Good ecological function.</p> <p>Moderate level of <b>disturbance/degradation</b> of vegetation on site.</p> <p><b>Conservation status</b> of the vegetation on site classified as Least Concern.</p> <p><b>Rehabilitation potential</b> of degraded Bhisho Thornveld.</p> <p>Scattered <b>aliens</b>.</p> <p>Presence of <b>SCC</b> (PNCO protected species).</p>	<b>Moderate Sensitivity</b>
(Dense Woody and Riparian Vegetation)		<b>High Sensitivity</b>
<b>Aquatic Habitat</b> (Natural and artificial wetlands)	All natural and artificial wetlands (dams). 50 m 'no-go' buffer on artificial (dam) and natural wetlands.	<b>High Sensitivity</b>
	500 m buffer placed around natural wetlands (regulated by DWS).	<b>Moderate Sensitivity</b>



Figure 3-2 below reflects the sensitivity of the site proposed for the Chaba BESS.

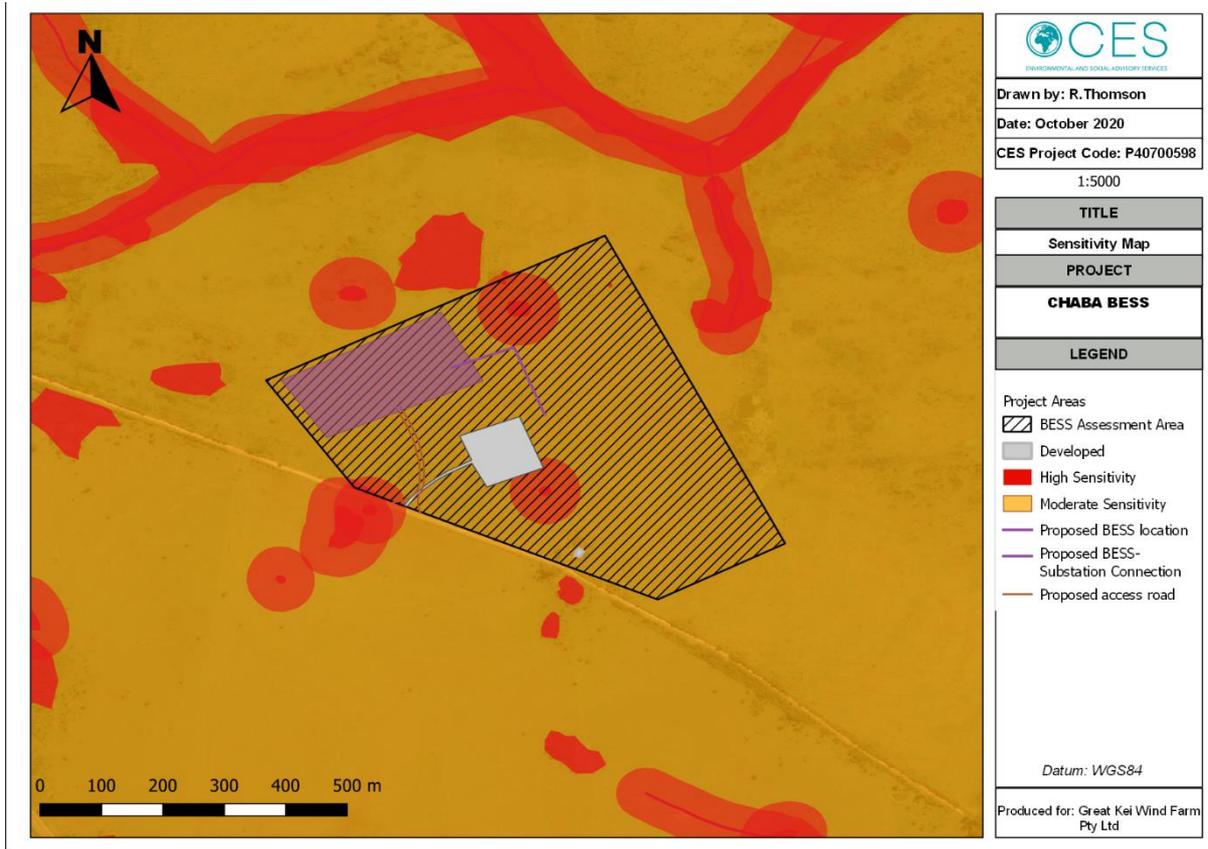


Figure 3-2: Sensitivity Map of the area within and surrounding the proposed Chaba BESS.



Figure 3-3 below shows the BESS footprint, which has been sited to avoid areas of high sensitivity.

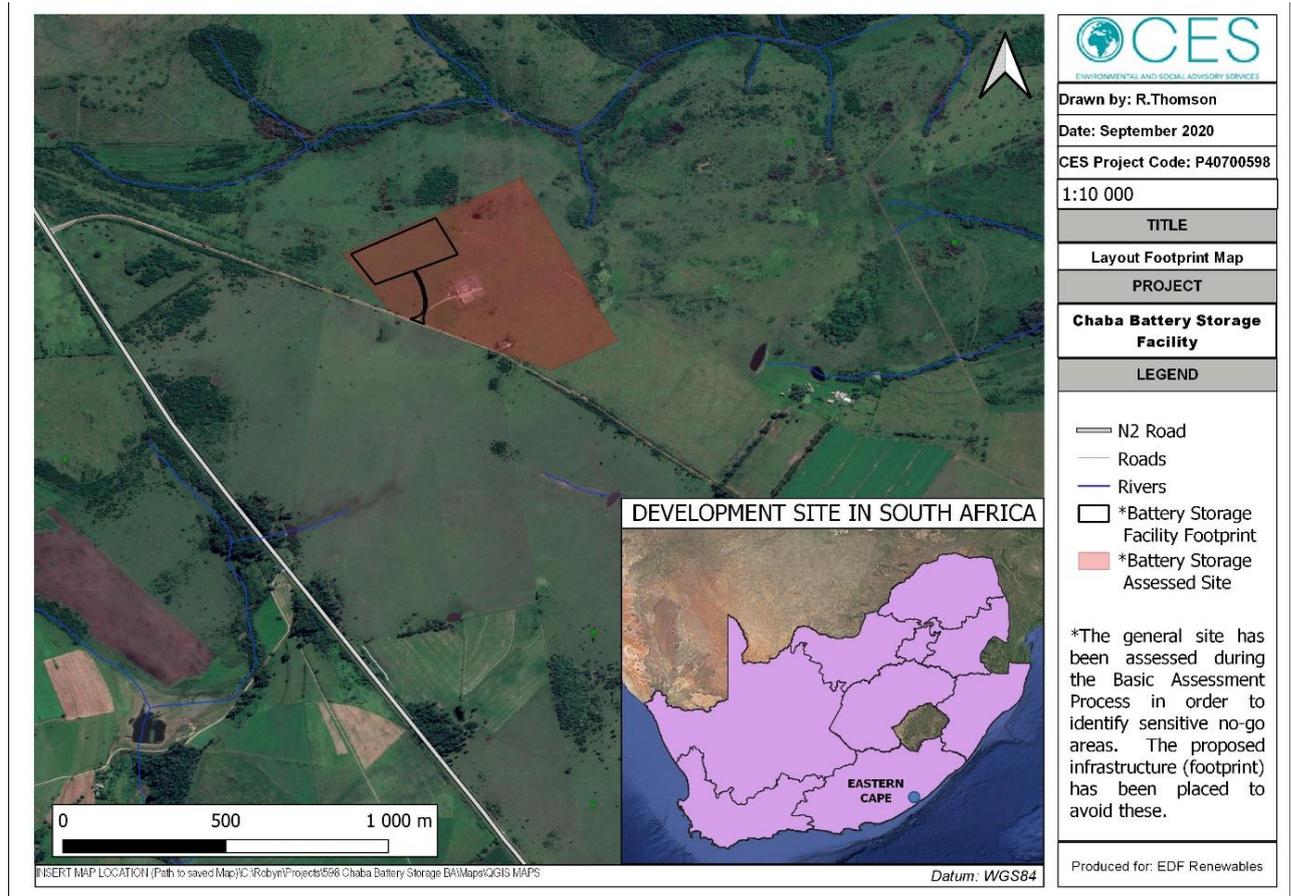


Figure 3-3: Footprint Layout Map of the proposed Chaba BESS



## 4 SCOPE OF THE EMPR

In order to ensure a holistic approach to the management of environmental impacts during the construction and operation of the proposed Chaba BESS, this EMPr sets out the methods by which proper environmental controls are to be implemented by the Contractor and all other parties involved.

The EMPr is a dynamic document subject to influences and changes as are wrought by variations to the provisions of the project specification.

### 4.1 LAYOUT OF THE EMPR

The EMPr is divided into four phases of development. Each phase has specific issues unique to that period of the construction and operation. The impacts are identified and given a brief description. The phases of the development are identified as below:

#### 4.1.1 Planning and Design Phase

This section of the EMPr provides management principles for the planning and design phase of the project. Environmental actions, procedures and responsibilities as required during the planning and design phase are specified. These specifications will form part of the contract documentation and therefore the Contractor must be required to comply with these specifications to the satisfaction of the Project Coordinator and ECO.

#### 4.1.2 Construction Phase

This section of the EMPr provides management principles for the construction phase of the project. Environmental actions, procedures and responsibilities as required during the construction phase are specified. These specifications will form part of the contract documentation and therefore the Contractor must be required to comply with these specifications to the satisfaction of the Project Coordinator and ECO.

#### 4.1.3 Operational and Maintenance Phase

This section of the EMPr provides management principles for the operation and maintenance phase of the project. Environmental actions, procedures and responsibilities as required during the operation and maintenance phase are specified.

#### 4.1.4 Decommissioning Phase

This section of the EMPr provides management principles for the decommissioning phase of the project. Environmental actions, procedures and responsibilities as required during the decommissioning phase are specified. These specifications will form part of the contract documentation and therefore the Contractor will be required to comply with these specifications to the satisfaction of the Project Coordinator and ECO.



## 5 SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES

According to APPENDIX 4 of GN R 362, an EMPr must include:

- (d) Information on any proposed management or mitigation measures that will be taken to address the environmental impacts that have been identified in a report contemplated by these Regulations, including environmental impacts or objectives in respect of –
  - (i) Planning and design;
  - (ii) Pre-construction;
  - (iii) construction activities;
  - (iv) Rehabilitation of the environment after construction and where applicable post closure; and
  - (v) where relevant, operation activities;
- (e) a description and identification of impact outcomes required for the aspects contemplated in (d).
- (f) a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable include actions to –
  - (i) Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;
  - (ii) Comply with any prescribed environmental management standards or practices;
  - (iii) Comply with any applicable provisions of the Act regarding closure, where applicable;
  - (iv) Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable.



## 5.1 PLANNING AND DESIGN PHASE

In addition to the site-specific conditions detailed below, all conditions included in the generic EMP (Appendix 1 and 2 of GN R 435) must be complied with.

### 5.1.1 General Impacts

#### Environmental Legal and Policy Compliance

Impact management outcome: All onsite staff must adhere to existing policies and legal obligations relating to local, provincial and national legislation and policies.						
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 legal matters pertaining to Environmental Authorisation, Water-Use Licenses and permitting must be completed prior to any construction activity.</li> <li>Ensure that all relevant legislation and policy is consulted and further ensure that the project is compliant with such legislation and policy.</li> <li>In addition, planning for the construction and operation of the proposed powerline should consider available best practice guidelines.</li> </ul>	Applicant	Acquire relevant permits/ authorisations where necessary	Planning and design phase (pre-construction)	Applicant	As required prior to construction	Authorisations /permits obtained; Copies of documents in site file

#### Storage of Hazardous Substances

Impact management outcome: Impacts on the environment from the use, handling, storage and disposal of hazardous substances are minimized.						
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>Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act 85 of 1993 and the SABS Code of Practice must be adhered to. This applies to solvents and other chemicals possibly used during the construction process.</li> <li>The individual(s) that will be handling hazardous materials must be trained to do so.</li> <li>All hazardous substances such as paints, diesel and cement must be stored in a bunded area with an impermeable surface beneath them.</li> <li>Cement and concrete must only be mixed in designated areas and on an impermeable surface. No concrete mixing must take place within 32 m of any watercourse.</li> <li>Maintenance of vehicles or machinery should not take place within 50 m of any watercourse and drip trays must be used.</li> <li>Spill kits must be kept on-site and maintained.</li> </ul>	Applicant and Contractor	Training; Preparation of correct storage facilities/areas; Designation of cement batching areas; Emergencies procedures and spill kits/drip trays available.	Planning and design phase (pre-construction)	ECO	Monthly during construction	Proof of training; Spill kits/drip trays, bunded areas (where necessary), cement mixing done in correct areas on lined surface.



<ul style="list-style-type: none"> <li>– Should a spill occur, the individual responsible for or the individual who discovers the petrochemical spill must report the incident to the Project Coordinator, ECO and/or Contractor as soon as reasonably possible.</li> <li>– The immediate response must be to contain the spill.</li> <li>– The ECO must determine the precise method of treatment of polluted soil. This could involve the application of oil absorbent materials or oil-digestive</li> </ul>						
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**General Waste Management**

<b>Impact management outcome:</b> Waste is appropriately stored, handled and safely disposed of at a recognized waste facility.						
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 a waste management plan for handling on site waste.</li> <li>– Designate an appropriate area where waste can be stored before disposal.</li> </ul>	Applicant and contractor	Waste Management Plan	Planning and design phase (pre-construction)	ECO	Monthly during construction	ECO audits to monitor general compliance

**Erosion**

<b>Impact management outcome:</b> Erosion must be 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>– Structures must be located at least 32m away from identified drainage lines.</li> </ul>	Applicant and Contractor	Erosion Management Plan	Planning and design phase (pre-construction)	ECO	Monthly during construction	ECO audits to monitor general compliance

**Traffic**

<b>Impact management outcome:</b> Safety provisions must be made for increased traffic during construction.						
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>– Consultation with the local Road Traffic Unit should be done early in the planning phase and if deemed necessary, road traffic permits should be obtained for transporting parts, containers, materials and construction equipment to the site.</li> <li>– Make provision for traffic accommodation where construction activities impact on existing roads.</li> </ul>	Applicant	Permits and provisions for construction related traffic to be obtained.	Planning and design phase (pre-construction)	ECO	Monthly during construction	ECO audits to monitor general compliance



**Site Establishment**

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>Specialist walkthroughs must take place to ensure the most appropriate micro-positioning of the substation, and pylon structures takes place.</li> <li>Search and rescue of plant SCCs must take place prior to construction.</li> <li>“no-go” areas must be clearly demarcated prior to commencement of any construction activities.</li> </ul>	Applicant	Specialist walk-throughs; Search and rescue	Planning and design phase (pre-construction)	ECO	Monthly during construction	ECO to audit whether recommendations from specialist walk-throughs are adhered to

**5.1.2 Freshwater Impacts**

**Scheduling of Construction**

Impact management outcome: Disturbance to the surrounding aquatic features are 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>Wherever possible, construction activities should be planned for commencement during the driest part of the year to minimize downstream sedimentation due to excavation, etc.</li> <li>When not possible, suitable stream diversion structures must be used to ensure the river is not negatively impacted by construction activity.</li> </ul>	Applicant and Contractor	Sediment traps and diversion structures	Planning and design phase (pre-construction)	ECO	Monthly during construction	ECO audits to monitoring general compliance

**Invasion of Alien Species**

Impact management outcome: Spread of alien invasive vegetation is minimised and controlled.						
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 Rehabilitation and Alien Vegetation Management Plan must be designed to reduce the establishment and spread of undesirable alien plant species.</li> </ul>	Applicant and Contractor	Rehabilitation and Alien Vegetation Management Plan	Planning and design phase (pre-construction)	ECO	Monthly during construction	ECO to monitor the implementation of this plan.



**Disturbance of Riparian and Wetland Habitat**

Impact management outcome: Disturbance to the surrounding riparian and wetland habitats are 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>– Design and placement of infrastructure should take into account the high sensitivity areas (rivers and wetlands) and avoid placement of infrastructure within these areas.</li> <li>– If not possible, scour countermeasures must be incorporated into all infrastructure within the high sensitivity areas.</li> <li>– Stormwater structure must be designed to minimise erosion and sedimentation of watercourses.</li> </ul>	Applicant and Engineer	Infrastructure design and demarcation.	Planning and design phase (pre-construction)	ECO	Monthly during construction	ECO audits to monitor general compliance



## 5.2 CONSTRUCTION PHASE

In addition to the site-specific conditions detailed below, all conditions included in the generic EMPr (Appendix 1 and 2 of GN R 435) must be complied with.

### 5.2.1 General Impacts

#### Legal and Policy Compliance

Impact management outcome: All onsite staff must adhere to existing policies and legal obligations relating to local, provincial and national legislation and policies.						
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 construction related conditions in the Environmental Authorisation, EMPr, Water Use License and other permits must be adhered to.</li> <li>The developer must employ an independent Environmental Control Officer (ECO) for the construction phase to ensure that construction is implemented according to specifications in the EA and EMPr.</li> <li>Copies of all applicable licenses, permits and managements plans (EA, EMPr, Water Use Licenses, Permits, etc.) must be available on-site at all times.</li> <li>Environmental Awareness Training must be included in site meetings/talks with all workers.</li> </ul>	Applicant and Contractor	ECO appointment; Environmental site file; Environmental Awareness training plan	Construction Phase	ECO	Monthly	ECO appointed; Permits and licenses in place; Copies of all documents on site; Environmental awareness training proof

#### Impacts on Surface and Groundwater Resources

Impact management outcome: Impacts to surface and groundwater resources must be 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>The Hazardous Chemical Substances Regulations, promulgated in terms of the Occupational Health and Safety Act (Act No. 85 of 1993), must be adhered to. This is applicable to solvents and any other chemicals that are to be used as part of the construction phase.</li> <li>All hydrocarbons and chemicals must be stored, outside any no-go areas, on impermeable surfaces with appropriately-sized containment bunds (110% of the volume of the contents within it) and grease traps. Traps must be regularly cleaned.</li> <li>All chemicals of all types must be stored on impermeable surfaces in secure and bunded designated storage areas.</li> </ul>	Applicant and Contractor	Training; Preparation of correct storage facilities/areas; Designation of cement batching areas; Emergencies procedures and spill kits/drip trays available.	Construction Phase	ECO	Monthly	ECO audits: Proof of training; No evidence of spills, Spill kits/drip trays and bunded areas used (where necessary), cement mixing



<ul style="list-style-type: none"> <li>- Cement must be stored on impermeable storage areas protected from the rain and mixed only in designated areas on impermeable surfaces. Cement residue must be cleaned up immediately.</li> <li>- No machinery must be parked overnight within 50 m of the rivers/wetlands.</li> <li>- All stationary machinery must be equipped with a drip tray to retain any oil leaks.</li> <li>- Vehicle repairs, servicing, refuelling and washing must be done only in designated areas with impermeable surfaces with appropriately-sized containment bunds and grease traps.</li> <li>- Where it is necessary to service, repair or refuel a vehicle or item of plant in the field drip trays must be used to catch drips, spills and leaks.</li> <li>- Spill kits must be available at all locations where chemicals of hydrocarbons are stored, handled or used, and spills must be cleaned up immediately in accordance with an established protocol appropriate to the material in question.</li> <li>- No ablution facilities should be located within 50 m of any river or wetland system.</li> <li>- Chemical toilets must be regularly maintained/ serviced to prevent ground or surface water pollution.</li> <li>- All general waste temporarily stored on site must be done so in windproof/sealable containers before being disposed of at a registered landfill site.</li> </ul>					done in correct areas on lined surface.
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**Traffic**

<p><b>Impact management outcome:</b> Traffic related impacts must be minimized.</p>						
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>- Appropriate warning signs must be in place to notify the public regarding construction activities.</li> <li>- Appropriate measures must be put in place to reduce the speed of construction and road traffic through community areas.</li> </ul>	Applicant and Contractor	Traffic calming measures and appropriate signage in place	Construction Phase	ECO	Monthly	Evidence of signage and traffic calming (where required) in place

**Removal of Top Soil and Soil Erosion**

<p><b>Impact management outcome:</b> Erosion and loss of topsoil is minimised.</p>						
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 Erosion Management Plan or method statement must be compiled (pre-construction) indicating what measures will be implemented during the Construction Phase;</li> <li>- Vegetation clearance must be kept to a minimum and retained where possible to avoid soil erosion;</li> <li>- Temporary disturbed areas must be rehabilitated as soon as practically possible;</li> <li>- Where possible, construction vehicles should only make use of the designated access routes and construction activities must be limited to the development footprint to avoid the compaction of the surrounding areas.</li> <li>- The appointed ECO must monitor soil compaction and erosion during the construction phase. Remedial action must be taken at the first signs of erosion.</li> <li>- Compacted areas should be ripped to loosen the soil structure.</li> <li>- Topsoil stockpiles must not be compacted.</li> <li>- Erosion controls and sediment trapping measures must be put in place, where necessary.</li> </ul>	<p>Applicant and Contractor</p>	<p>Erosion control measures</p>	<p>Construction phase</p>	<p>ECO</p>	<p>Monthly</p>	<p>ECO audits to monitor general compliance.</p>
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### General Waste Management

Impact management outcome: Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
<ul style="list-style-type: none"> <li>- Littering must be avoided, and litter bins must be made available at various strategic points on site.</li> <li>- The waste management hierarchy must be implemented as far as possible and the disposal of waste must be considered as a last resort. All general and hazardous waste generated during the construction phase must be recorded and separated into the different waste streams to allow ease of recover prior to removal by a reputable contractor from the construction site for re-use, recovery or disposal at an appropriate licensed waste disposal facility.</li> </ul>	Applicant and Contractor	As per Waste Management Plan	Construction Phase	ECO	Monthly	ECO audits to monitor general compliance

### Air Quality

Impact management outcome: Air quality (dust) impacts are 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>- Fugitive/nuisance dust could be reduced by implementing the following:                             <ul style="list-style-type: none"> <li>- Watering down of un-surfaced and cleared areas during windy conditions (non-potable water should be used for this);</li> <li>- Retention of vegetation where possible;</li> <li>- A speed limit of 40km/h must not be exceeded on dirt roads;</li> <li>- If fine building materials, such as sand, are to be transported on the back of trucks, they must be adequately covered.</li> <li>- Excavations and other clearing activities must only be done during the agreed-upon working hours and days.</li> </ul> </li> <li>- Exhaust emissions from construction vehicles must be minimised by ensuring that all vehicles are properly equipped and serviced.</li> <li>- Any complaints or claims emanating from the lack of dust control should be attended to immediately by the Contractor.</li> </ul>	Applicant and Contractor	Monitoring of nuisance dust and dampening when required.	Construction Phase	ECO	Monthly	ECO audits – evidence of uncontrolled dust and complaints received?

### Noise Pollution

Impact management outcome: Noise must be 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>All construction vehicles must be in sound working order and meet the necessary noise level requirements.</li> <li>Applicable municipal by-laws relating to noise control must be adhered to.</li> <li>Construction activities close to residential settlements, which includes the movement of construction vehicles, should be restricted to normal working hours (7:00am – 17:00pm).</li> </ul>	Contractor	By-laws regarding working hours implemented	Construction Phase	ECO	Monthly	ECO audits – complaints received regarding noise?

**Sanitation**

Impact management outcome: Adequate sanitation is provided, serviced and disposed of at a license waste facility.						
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>Temporary ablation facilities must be provided for construction workers.</li> <li>The facilities must be serviced regularly to reduce the risk of surface or groundwater pollution.</li> </ul>	Applicant and Contractor	Provision of ablutions, regular servicing by appointed service provider/disposal at licensed facility.	Construction Phase	ECO	Monthly	ECO audits – proof of servicing/waste disposal slips, adequate number of ablutions provided

**Fire**

Impact management outcome: Disturbance to natural vegetation must be 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>The contractor must ensure that operational firefighting equipment is present on site at all times as per the Occupational Health and Safety Act.</li> <li>All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances.</li> <li>No open fires are to be permitted.</li> <li>There should be no burning of vegetation or construction waste or debris onsite.</li> </ul>	Contractor	Monitoring	Construction Phase	ECO	Monthly	Regular monitoring of the implementation of these plans



<ul style="list-style-type: none"> <li>- The Contractor and/or the appointed fire marshal must ensure that all site personnel are aware of the risk of fires, the procedure to be followed in the event of a fire and that all site personnel have access to the relevant contact details of the nearest Fire and Emergency Services.</li> </ul>					
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**Traffic**

<b>Impact management outcome:</b> Traffic impacts must be minimised and safety provisions implemented.						
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>- Construction vehicles should not utilise roads during peak hours to avoid impacts on traffic flow.</li> <li>- Should large construction vehicles damage any existing road infrastructure these should be repaired immediately.</li> </ul>	Applicant and Contractor	General monitoring	Construction Phase	ECO	Monthly	ECO audits – general monitoring and evidence of road deterioration.

**5.2.2 Ecological Impacts**

**Loss of indigenous vegetation (Bhisho Thornveld)**

<b>Impact management outcome:</b> Loss of natural vegetation must be 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>- The clearance of vegetation at any given time should be kept to a minimum.</li> <li>- No vegetation clearance must occur within dense woody vegetation (bush clumps) or riparian areas, and within 50m of any artificial or natural wetland.</li> <li>- Protected tree species identified on site must be avoided.</li> <li>- Employees must be prohibited from making fires and harvesting plants.</li> <li>- As far as practically possible, existing roads or tracks should be utilised.</li> </ul>	Applicant and Contractor	Infrastructure placement to be advised by specialist walk-through	Construction Phase	ECO	Monthly	ECO to monitoring vegetation clearing

**Biodiversity loss**

<b>Impact management outcome:</b> Disturbance to the local biodiversity is minimised.						
Impact Management Actions	Implementation			Monitoring		
	Responsible	Method of	Timeframe for	Responsible	Frequency	Evidence of



	person	implementation	implementation	person		compliance
<ul style="list-style-type: none"> <li>– Areas classified as 'high sensitivity', such as dense woody and riparian vegetation, natural and artificial wetlands must be avoided.</li> <li>– Construction and operational activities must be limited to within the site boundary only, and the surrounding riparian and dense woody vegetated areas must remain intact and undisturbed by the development.</li> <li>– Prohibit all employees from harvesting plants;</li> <li>– Prohibit open fires;</li> <li>– An ECO must be employed to demarcate areas for use during construction, and to ensure that the construction activities remain within the designated area and that no unauthorised activities occur outside of the construction footprint.</li> <li>– All clearing activities must deploy search and rescue teams in front of clearing machinery to assist in relocating slower moving faunal species e.g. tortoises out of the clearing path and relocating to No-Go zones.</li> <li>– Speed restrictions for all project vehicles (40km/h is recommended) should be in place to reduce road kills of fauna killed on the project roads.</li> <li>– Prevent employees from killing snakes through environmental training and awareness.</li> <li>– Any trenches built must have slopes that allow fauna that fall in to escape and must be backfilled.</li> <li>– Any contractor employed for development work must ensure that no faunal species are disturbed, trapped, hunted or killed by them and their team during the construction phase. Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance.</li> </ul>	Applicant and Contractor	ECO and Contractor to demarcate clearance areas; Search and rescue activities prior to clearing; Environmental awareness training for workers	Construction Phase	ECO	Monthly	ECO audits to monitor general compliance

**Loss of Species of Conservation Concern**

Impact management outcome: The loss of species of conservation concern are 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>– A comprehensive Plant and Faunal Search and Rescue must be conducted by an appropriately qualified individual prior to vegetation clearance.</li> <li>– Any SCC should be translocated to the nearest appropriate habitat by an appropriately qualified individual.</li> <li>– Permits for protected or threatened species must be acquired prior to vegetation clearance, should they be affected.</li> <li>– Refer to mitigation measures listed under the Loss of Biodiversity impact above.</li> </ul>	Applicant and Contractor	ECO and Contractor to demarcate clearance areas; Search and rescue activities prior to clearing; Environmental awareness training for	Construction Phase	ECO	Monthly	ECO audits to monitor general compliance



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**Fragmentation of habitats**

<b>Impact management outcome:</b> Fragmentation of habitats must be 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>- A comprehensive Faunal Search and Rescue must be conducted prior to vegetation clearance;</li> <li>- The clearance of vegetation at any given time should be kept to a minimum and avoid all 'no-go' areas;</li> <li>- Vegetation clearance and trampling must be avoided in areas demarcated as no-go areas;</li> <li>- Employees must not trap, hunt, handle or remove any faunal species from the site;</li> <li>- As far as practically possible, existing roads and tracks must be utilized.</li> </ul>	Applicant and Contractor	Search and rescue; Demarcation and implementation of buffers and no-go areas.	Construction Phase	ECO	Monthly	ECO audits to monitor general compliance

**5.2.3 Freshwater Impacts**

**Disturbance of Riparian and Wetland Habitat**

<b>Impact management outcome:</b> Disturbance to Riparian and Wetland Habitat must be 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>- Vegetation clearing must be limited to the construction footprint only.</li> <li>- Construction of pylons within the high and moderate sensitivity areas should be avoided as far as feasibly possible.</li> <li>- Construction vehicles and machinery must not encroach into identified 'no-go' areas or areas outside the project footprint.</li> <li>- Activities within 500m of wetland must obtain the necessary Water Use License prior to the commencement of such activities.</li> <li>- Stockpiles must be monitored for erosion and mobilisation of materials towards watercourses.</li> <li>- Regular dust suppression measures must be implemented.</li> <li>- A Rehabilitation and Alien Vegetation Management Plan must be developed and</li> </ul>	Applicant and Contractor	Implementation of Aquatic Specialist's recommendations	Construction Phase	ECO	Monthly	ECO audit to monitor the implementation of aquatic specialist recommendation's



<p>implemented.</p> <ul style="list-style-type: none"><li>- Removal of the alien invasive vegetation should be prioritised.</li><li>- River banks should be stabilised as soon as possible if significant riparian vegetation is removed.</li><li>- Cofferdams (if required) must not be left in place for longer than 30 days.</li><li>- Although, most of the rivers within the study area are non-perennial, water should still be allowed to pass downstream of the construction which can be achieved via temporary diversion which should not be in place for longer than 30 days.</li></ul>						
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**Accidental Spillage of Hazardous Substances/ Waste affecting water quality**

Impact management outcome: Water quality impacts must be 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>The Hazardous Chemical Substances Regulations, promulgated in terms of the Occupational Health and Safety Act (Act No. 85 of 1993), must be adhered to. This is applicable to solvents and any other chemicals that are to be used as part of the construction phase.</li> <li>No machinery must be parked overnight within 50 m of the rivers/wetlands.</li> <li>All stationary machinery must be equipped with a drip tray to retain any oil leaks.</li> <li>Chemicals used must be stored safely on bunded surfaces in the site camp.</li> <li>Cement mixing must take place on a contained and impermeable surface, should it be undertaken on site.</li> <li>Emergency plans, and spill kits, must be in place in case of accidental spillages on site.</li> <li>No ablution facilities should be located within 50 m of any river or wetland system.</li> <li>Chemical toilets must be regularly maintained/ serviced to prevent ground or surface water pollution.</li> <li>Any hazardous substances/waste must be stored in impermeable bunded areas or secondary containers 110% the volume of the contents within it.</li> <li>All general waste temporarily stored on site must be done so in windproof/sealable containers before being disposed of at a registered landfill site.</li> </ul>	Applicant and Contractor	Implementation of Aquatic Specialist's recommendations	Construction Phase	ECO	Monthly	ECO audit to monitor the implementation of aquatic specialist recommendation's

**Invasion of Alien Species**

Impact management outcome: The spread of alien invasive vegetation must be controlled and 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>Implement an Alien Management Plan during the construction phase.</li> <li>Eradicate alien plants from the impacted area as they appear;</li> <li>Monitor the project area for any new growth of invasive plants until completion of construction.</li> <li>Short-term monitoring for a period of 12 months after construction has been completed should be conducted.</li> <li>Vehicles and machinery must park and operate within suitably designated areas to prevent</li> </ul>	Applicant and Contractor	Implementation of Alien Management and Monitoring Plan	Construction Phase	ECO	Monthly	ECO audit to monitor the implementation of the Alien Management and Monitoring Plan



unnecessary disturbance of the larger environment. – Vehicle and machinery use should also be limited within the moderate and high sensitivity areas.						
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### 5.2.4 Heritage Impacts

#### ***Disturbance of Archaeological Material***

Impact management outcome: Archaeological findings must be preserved and disturbance 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>Should any material be exposed then work must cease in the immediate area and it must be reported to the Albany Museum (Tel: 046 6222312) or to the Eastern Cape Provincial Heritage Resources Authority (Tel: 043 7450888), so that a systematic and professional investigation can be undertaken.</li> <li>Sufficient time should be allowed to remove/collect such material (See Appendix B of the appended Archaeological Letter of Recommendation for a list of possible archaeological sites that maybe found in the area).</li> </ul>	Applicant and Contractor	List of possible archaeological sites that may be found in the area must be included in the environmental management training and toolbox talks.	Construction Phase	ECO	Monthly	ECO audit to monitor training and toolbox talks done by the site environmental officer

### 5.2.5 Social Impacts

Impact management outcome: Promote socio-economic benefits whilst minimising the impacts.						
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>Indirect Economic Impacts:                             <ul style="list-style-type: none"> <li>Wherever possible the developer should source service contractors from within the local, district and region.</li> </ul> </li> <li>Loss of Agricultural Land and Income:                             <ul style="list-style-type: none"> <li>Financially compensate the affected farmers for loss of land and income.</li> <li>The construction footprint must be surveyed and demarcated prior to construction commencing to ensure that there is no unnecessary loss of agricultural land outside the approved footprint.</li> <li>Vegetation clearance should be restricted to the demarcated development footprint.</li> </ul> </li> </ul>	Applicant and Contractor	Local employment prioritized; landowners negotiations undertaken; Health and Safety measures implemented	Construction Phase	ECO	Monthly	ECO audits to monitor general compliance



<ul style="list-style-type: none"> <li>- The layout of the facility should be developed in a manner that requires the smallest footprint, where possible, to minimise the loss of grazing land.</li> <li>- Soil erosion and soil compaction near the demarcated development footprints must be monitored and managed during construction to prevent the loss of additional grazing land due to degradation.</li> <li>- Stocking rates of livestock, in this case cattle, may need to be reconsidered based on the remaining hectares available for grazing needed in order to prevent the possibility of overgrazing.</li> <li>- Controlled access must be implemented to monitor access to the project site during the construction phase.</li> <li>- No unauthorised individuals should be allowed to access the project site without permission from the landowners and/or the developers during the construction phase.</li> <li>- Construction workers must not handle or remove any livestock or wildlife from the project area and the surrounding properties.</li> <li>- Severe penalties should be in place and legal action should be taken against any construction workers that handle or remove any livestock or wildlife from the project area and/or surrounding areas.</li> <li>- Manage the timing of the construction activities to avoid the land preparation and growing seasons.</li> <li>- Health and Safety – Hazardous substances:             <ul style="list-style-type: none"> <li>- Plan and make provision for the appropriate storage and transport of hazardous substances (i.e. cement, tar, fuel, bitumen &amp; oil) during the construction period.</li> <li>- Inform all employees and contractors of the appropriate and legally required safety measures associated with the installation, maintenance and operation of powerlines and substations.</li> <li>- Hazardous Chemical Substances Regulations promulgated in terms of the Occupational Health and Safety Act 85 of 1993 and the SABS Code of Practise must be adhered to. This applies to solvents and other chemicals possibly used during the construction process.</li> <li>- The individual(s) that will be handling hazardous materials must be trained to do so.</li> <li>- All hazardous chemicals must be stored properly in a secure, bunded and contained area.</li> <li>- Concrete must not be mixed directly on the ground, or during rainfall events when the potential for transport to the stormwater system is the greatest.</li> <li>- Concrete must only be mixed in the area demarcated for this purpose and on an impermeable surface.</li> <li>- Drip trays must be placed under construction machinery to avoid soil contamination.</li> </ul> </li> </ul>					
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<ul style="list-style-type: none"> <li>- Should a spill occur, the individual responsible for or the individual who discovers the petrochemical spill must report the incident to the Project Coordinator, ECO and/or Contractor as soon as reasonably possible.</li> <li>- The immediate response must be to contain the spill.</li> <li>- The ECO must determine the precise method of treatment of polluted soil. This could involve the application of oil absorbent materials or oil-digestive.</li>   <li>- Visual Impacts:</li> <li>- The site camp must be placed in an area that is not visually obtrusive to the neighbouring properties or local communities.</li> <li>- The site camp and temporary structures must be decommissioned, and the area rehabilitated once construction has been completed.</li> <li>- All waste, materials and equipment must be removed from site.</li> <li>- The project area is to be kept tidy and free of litter, where possible.</li> </ul>					
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### 5.3 OPERATIONAL PHASE

#### 5.3.1 General Impacts

##### *Climate Change*

Impact management outcome: Renewable energy should be promoted.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Enhance this impact by promoting the use of renewable energy locally.	Applicant	None recommended	Operation Phase	Applicant	Ongoing	None recommended

#### 5.3.2 Ecological Impacts

##### *Invasion of Alien Plant Species*

Impact management outcome: Disturbance to the ecological environment must be minimised.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– An invasive alien plant management plan must be designed and implemented to remove the alien species within the areas disturbed by construction activities. This plan must designate management units and prescribe the most effective method of removing the species.	Applicant	alien plant management plan	Operation and Maintenance Phase	Applicant	Ongoing, as needed	Regular control

##### *Inadequate Rehabilitation and Maintenance of Disturbed Areas*

Impact management outcome: Disturbance to the ecological environment must be minimised.						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– A Rehabilitation and Maintenance Plan (compiled pre-construction), must be implemented to ensure all previously disturbed areas are rehabilitated to the satisfaction of an appointed ECO. – No-go areas must be avoided during operation and maintenance activities.	Applicant	Rehabilitation and maintenance plan	Operation and Maintenance Phase	Applicant	Ongoing, as needed	Regular control



### 5.3.3 Freshwater Impacts

Impact management outcome: Disturbance to the aquatic environment must be 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>- <b>Invasion of Alien Species:</b> <ul style="list-style-type: none"> <li>- An alien vegetation removal and rehabilitation plan must be implemented post-construction.</li> <li>- The effectiveness of this plan should be monitored biannually for the first year following construction or until such time as the ECO deems the rehabilitation sufficient.</li> <li>- Alien plants must be removed from aquatic environments through appropriate methods such as hand pulling, cutting etc. This must be done under the supervision of the ECO.</li> </ul> </li> <li>- <b>Disturbance of Riparian and Wetland Habitat:</b> <ul style="list-style-type: none"> <li>- Maintenance vehicles and clearing of any vegetation must be kept to existing footprints and access roads as far as possible.</li> <li>- Any maintenance activities and/or driving of vehicles within the high sensitivity areas must be avoided.</li> </ul> </li> <li>- <b>Stormwater Management:</b> <ul style="list-style-type: none"> <li>- No machinery must be parked overnight within 50 m of the rivers/wetlands.</li> <li>- All stationary machinery must be equipped with a drip tray to retain any oil leaks.</li> <li>- Chemicals used must be stored safely on bunded surfaces in the site camp.</li> <li>- Emergency plans, and spill kits, must be in place in case of accidental spillages on site when required during maintenance activities.</li> <li>- Any hazardous substances/waste must be stored in impermeable bunded areas or secondary containers 110% the volume of the contents within it.</li> <li>- All general and hazardous waste must be removed from site and disposed of at a registered landfill site.</li> </ul> </li> </ul>	Applicant	Alien vegetation removal and rehabilitation plan implemented, regular monitoring and maintenance of scouring and erosion	Operation Phase	Applicant	Ongoing	Regular monitoring and maintenance

### 5.3.4 Soil Erosion and Compaction

Impact management outcome: Disturbance to the ecological environment must be 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>All maintenance equipment and vehicles should only make use of the designated access routes and internal roads to avoid soil compaction. Maintenance vehicles are not allowed to drive off-road/off the designated tracks.</li> <li>Soil compaction and erosion should be monitored during the operational phase and remedial action must be taken at the first signs of soil compaction and increased soil erosion.</li> </ul>	Applicant	Rehabilitation and maintenance plan	Operation and Maintenance Phase	Applicant	Ongoing, as needed	Regular control

### 5.3.5 Heritage Impacts

Impact management outcome: Disturbance to the surrounding heritage environment must be 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><b>Change to Setting of Cultural Landscape:</b> <ul style="list-style-type: none"> <li>Identified heritage and cultural sites of importance must be avoided during operation and maintenance activities as per conditions during the construction phase.</li> </ul> </li> </ul>	Applicant	Ongoing avoidance and monitoring during operational and maintenance activities	Operation and Maintenance Phase	Applicant	Ongoing	Regular monitoring



## 5.4 DECOMMISSIONING PHASE

As per the temporal scales indicated in the significance statement for the operational phase in the section above, the proposed Chaba BESS Development is likely to be used over an extensive period of time, and decommissioning is not foreseen in the near future. Should the infrastructure be decommissioned in the long term, the impacts associated with the decommissioning phase will be similar to those for the construction phase and the mitigation measures stipulated for the construction phase will, therefore, be relevant. However, it is recommended that the final construction phase EMP be updated, based on the environmental conditions and relevant legislation at the time, and implemented during the decommissioning of the Chaba BESS.



## 6 ENVIRONMENTAL MONITORING

**According to APPENDIX 4 of GN R 326, an EMPr must include:**

- (g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);
- (h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);

**Part A: Section 4 of GN R 435** details reporting systems, documentation controls and compliance mechanisms which must be in place for all substation infrastructure and overhead electricity transmission and distribution infrastructure projects as a minimum requirement.

The monitoring programme must be implemented for the duration of the construction and operation of the Chaba BESS. This programme should include:

- Establishing a baseline of pre-construction site conditions validated with photographic evidence.
- Monthly audits will be conducted by an independent ECO for the construction phase to ensure compliance with the conditions stipulated in this EMPr and, where necessary, make recommendations for corrective action. These audits can be conducted randomly and do not require prior arrangement with the Project Coordinator.
- Compilation of an audit report with a rating of compliance with the EMPr. The ECO must keep a photographic record of the demarcated site and construction area. The Contractor must be held liable for all unnecessary damage to the environment. A register must be kept of all complaints from the community. All complaints / claims must be handled immediately to ensure timeous rectification / payment by the responsible party.



## 7 ROLES AND RESPONSIBILITIES

According to APPENDIX 4 of GN R 326, an EMPr must include:

- (i) An indication of the persons who will be responsible for the implementation of the impact management actions;

**Part A: Section 3 of Appendix 1 and 2 of GN R 435** establishes clear roles, responsibilities and reporting lines within an institutional framework, which must be taken into consideration.

### 7.1 PROJECT COORDINATOR

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

- Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures;
- Monitor site activities on a daily basis for compliance;
- Conduct internal audits of the construction site against the EMPr;
- Confine the construction site to the demarcated areas; and
- Rectify transgressions through the implementation of corrective action.

### 7.2 CONTRACTOR

The Contractor is responsible for the overall execution of the activities envisioned in the construction phase, including the implementation and compliance with recommendations and conditions of the EMPr. The Contractor must therefore ensure compliance with the EMPr at all times during construction activities and maintain an environmental register which keeps a record of all environmental incidents that occur on the site during construction and rehabilitation of the sub-transmission line. These incidents may include:

- Public involvement / complaints;
- Health and safety incidents;
- Incidents involving Hazardous materials stored on site; and
- Non-compliance incidents.

The Contractor is also responsible for the implementation of corrective actions issued by the ECO and Project Coordinator within a reasonable or agreed upon period of time.

### 7.3 ENVIRONMENTAL CONTROL OFFICER



For the purposes of implementing the conditions contained herein, an ECO must be appointed for the contract. The ECO must be the responsible person for ensuring that the provisions of the EMPr and that any necessary environmental authorisations are complied with during the construction period. The ECO's duties in this regard will include, *but are not limited to*, the following:

- Conduct regular site visits to be able to report on and respond to any environmental issues;
- Report compliance and non-compliance issues to the competent authority;
- Advise the Contractor on environmental issues within the defined work areas;
- Review access and incident records that may pertain to the environment and reconcile the entries with the observations made during site inspection, monitoring and auditing;
- Recommend corrective action when required for aspects of non-compliance within the EMPr;
- Take immediate action on site where clearly defined and agreed upon "no-go" areas are violated or in danger of being violated, inform an Eskom representative of the occurrence immediately and take action; and
- Be contactable by the public regarding matters of environmental concern as they relate to the operation of the works.



## 8 COMPLIANCE WITH THE EMPr

According to APPENDIX 4 of GN R 326, an EMPr must include:

- (j) The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;
- (k) The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);

A copy of the EMPr must be kept on site at all times during the construction period. The EMPr will be binding on all contractors operating on the site and must be included within the Contractual Clauses.

It should be noted that in terms of Section 28 of the National Environmental Management Act (No. 107 of 1998): those responsible for environmental damage must pay the repair costs both to the environment, human health and the preventative measures to reduce or prevent further pollution and/or environmental damage (The 'polluter pays' principle).

### 8.1 NON-COMPLIANCE

The contractors must act immediately when notice of non-compliance is received and take corrective action. Complaints received regarding activities on the construction site pertaining to the environment must be recorded in a dedicated register and the response(s) 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 must be reported to the competent authority 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 evidence of contravention of the EMPr specifications within the boundaries of the construction site and site extensions;
- There is contravention of the EMPr specifications which relate to activities outside the boundaries of the construction site;
- Environmental damage ensues due to negligence;
- Construction activities take place outside the defined boundaries of the site; and/or
- The Contractor fails to comply with corrective or other instructions issued within a specific time period.

**It is recommended that the Contractors institute penalties for the following less serious violations and any others determined during the course of work, as detailed below:**



- Littering on site.
- Lighting of illegal fires on site.
- Persistent or unrepaired fuel and oil leaks.
- Any persons, vehicles or equipment related to the Contractor's operations found within the designated "no-go" areas.
- Excess dust or excess noise emanating from site.
- Possession or use of intoxicating substances on site.
- Any vehicles being driven in excess of designated speed limits.
- Removal and/or damage to fauna, flora, cultural or heritage objects on site.
- Urination and defecation anywhere except at designated facilities.

## 8.2 EMERGENCY PREPAREDNESS

The Contractor must compile and maintain environmental emergency procedures to ensure that there will be appropriate responses to unexpected or accidental actions or incidents that will cause environmental impacts, throughout the construction period. Such activities may include, *inter alia*:

- Accidental waste water discharges to water and land.
- Accidental fires.
- Accidental spillage of hazardous substances.
- Specific environmental and ecosystem effects from accidental releases or incidents.

These plans should include:

- Emergency organisation (manpower) and responsibilities, accountability and liability.
- A list of key personnel and contact details.
- Details of emergency services available (e.g. the fire department, spill clean-up services, etc.).
- Internal and external communication plans, including prescribed reporting procedures where required by legislation.
- Actions to be taken in the event of different types of emergencies.
- Incident recording, progress reporting and remediation measures required to be implemented.
- Information on hazardous materials, including the potential impact associated with each, and measures to be taken in the event of accidental release.
- Training plans, testing exercises and schedules for effectiveness.

The Contractor must comply with the emergency preparedness and incident- and accident-reporting requirements, as required by the Occupational Health and Safety Act (No. 85 of 1993), the NEMA (No. 107 of 1998) and the National Water Act (No. 36 of 1998) as amended and/or any other relevant legislation.

## 8.3 INCIDENT REPORTING AND REMEDY



If a leakage or spillage of hazardous substances occurs on site, the local emergency services and all relevant authorities (including the Environmental Officer at Saldanha Bay Municipality and the Western Cape Pollution and Chemicals Management Directorate) must be immediately notified of the incident. The following information must be provided:

- the location;
- the nature of the load;
- the extent of the impact; and
- the status at the site of the accident itself (i.e. whether further leakage is still taking place, whether the vehicle or the load is on fire).

Written records on the corrective and remedial measures decided upon and the progress achieved therewith over time, including safe disposal certificates from service providers, must be filed and kept on site. Such progress reporting is important for monitoring and auditing purposes. The written reports may be used for training purposes in an effort to prevent similar future occurrences.

## 8.4 PENALTIES

Where environmental damage is caused or a pollution incident, and/or failure to comply with any of the environmental specifications contained in the EMP, the Contractor will be liable. The following violations, and any others determined during the course of work, should be penalised:

- Hazardous chemical/oil spill and/or dumping in non-approved sites.
- Damage to sensitive environments.
- Damage to cultural and historical sites.
- Unauthorised removal/damage to indigenous trees and other vegetation, particularly in identified sensitive areas.
- Uncontrolled/unmanaged erosion.
- Unauthorised blasting activities (if applicable).
- Pollution of water sources.
- Unnecessary removal or damage to trees.

The following steps will be followed by the ECO, when observing a transgression:

1. **Transgression observed:** Give a warning to the Contractor, with time to remedy the situation. Report transgression and agreed remedial action.
2. **Transgression not remedied:** Report the Contractor and issue a financial penalty to the Contractor with an agreed time period to remedy the situation.
3. **Failure to remediate:** Depending on the severity and impact significance of the transgression, the ECO may report directly to DEA (Compliance) recommending that for:
  1. HIGH impact: DEA to issue a notice to cease construction;
  2. MEDIUM impact: DEA to issue a notice instructing the implementation of recommended remedial action; and/or



3. LOW impact: ECO to notify, but up to discretion of DEA to apply sanction.

In all cases, however, non-compliance must be reported to DEA in the monthly audit reports. However, the ECO will also report on corrective actions proposed and implemented.

The following schedule of fines for environmental damage or EMPr transgressions have been adapted from the City of Cape Town: Standard Environmental Specifications.

**Table 8.1. List of fines for transgressions or resultant environmental damage**

TRANSGRESSION OR RESULTANT ENVIRONMENTAL DAMAGE	Min. fine	Max. fine
Failure to comply with prescriptions regarding ECO appointment and monitoring of EMPr	R1 000	R2 000
Failure to comply with prescriptions regarding environmental awareness training	R2000	R10 000
Failure to comply with prescriptions regarding method statements	R2 000	R10 000
Failure to report environmental damage or EMPr transgressions to the ECO	R1 000	R2 000
Failure to carry out instructions of the DEO/ECO regarding the environment of the EMPr	R1 000	R2 000
Failure to comply with prescriptions posting of emergency numbers	R2 000	R10 000
Failure to comply with prescriptions regarding information boards	R1 000	R2 000
Failure to comply with prescriptions regarding a complaints register	R1 000	R2 000
Failure to comply with prescriptions regarding site demarcation and enforcement of “no go” areas	R2 000	R10 000
Failure to comply with prescriptions regarding site clearing	R2 000	R10 000
Failure to comply with prescriptions for the storage of imported materials within a designated Contractors yard	R1 000	R2 000
Failure to comply with prescribed administration, storage or handling of hazardous substances	R1 000	R2 000
Failure to comply with prescriptions regarding equipment maintenance and storage	R1 000	R2 000
Failure to comply with fuel storage, refuelling, or clean-up prescriptions	R1 000	R2 000
Failure to comply with prescriptions regarding procedures for emergencies (spillages and fires)	R2 000	R10 000
Failure to comply with prescriptions regarding construction camp	R2 000	R10 000
Failure to comply with prescriptions for the use of ablution facilities	R1 000	R2 000
Failure to comply with prescriptions regarding water provision	R1 000	R2 000
Failure to comply with prescriptions for the use of designated eating areas, heating source for cooking or presence of fire extinguishers	R1 000	R2 000
Failure to comply with prescriptions regarding fire control	R2 000	R10 000
Failure to comply with prescriptions for solid waste management	R2 000	R10 000
Failure to comply with prescriptions to prevent water pollution and sedimentation	R2 000	R10 000
Failure to comply with prescriptions to the protection of natural features, flora, fauna and archaeology	R2 000	R10 000
Failure to comply with prescriptions regarding speed limits	R1 000	R2 000
Failure to comply with prescriptions regarding noise levels of construction activity	R2 000	R10 000
Failure to comply with prescriptions regarding working hours	R2 000	R10 000



Failure to comply with prescriptions regarding aesthetics	R1 000	R2 000
Failure to comply with prescriptions regarding dust control	R1 000	R2 000
Failure to comply with prescriptions regarding security and access onto private property	R1 000	R2 000
Failure to comply with prescriptions regarding cement and concrete batching	R2 000	R10 000



## 9 REPORTING

**According to APPENDIX 4 of GN R 982, an EMPr must include:**

- (l) A program for reporting on compliance, taking into account the requirement as prescribed by the regulations;

### 9.1 METHOD STATEMENTS

Before the construction activities commence, the Contractor must provide the ECO and the Applicant with a written method statement setting out the following:

- Details of the construction activities;
- Location where the activity will take place;
- Identification of impacts that might result from the activity;
- Identification of activities that may cause impacts;
- Methodology and/or specifications for impact prevention for each activity or aspect;
- Methodology and/or specifications for impact containment for each activity or aspect;
- Emergency/disaster incident and reaction procedures; and the
- Treatment and continued maintenance of the impacted environment.

The Contractor should provide such information in advance of any or all construction activities provided that new submissions are given to the ECO whenever there is a change or variation to the original. The ECO should provide comment on the methodology and procedures proposed by the Contractor, but he/she will not be responsible for the Contractor's chosen measures of impact mitigation and emergency/disaster management systems.

### 9.2 GOOD HOUSEKEEPING

The Contractor must undertake "good housekeeping" practices during construction. This will help avoid disputes on responsibility and allow for the smooth running of the contract as a whole. Good housekeeping extends beyond the wise practice of construction methods to include the care for and preservation of the environment within which the construction is situated.

### 9.3 RECORD KEEPING

The ECO must continuously monitor the Contractor's adherence to the approved impact prevention procedures and the ECO must issue the Contractor with a notice of non-compliance whenever transgressions are observed. The ECO should document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action



taken to mitigate its effects and the results of the actions. The non-compliance should be documented and reported to the Applicant in the monthly report. These reports must be made available to DEA when requested.

## 9.4 DOCUMENT CONTROL

The Contractor is responsible for establishing a procedure for electronic document control. The document control procedure should comply with the following requirements:

- Documents must be identifiable by organisation, division, function, activity and contact person.
- Every document should identify the personnel and their position(s), who drafted and compiled the document(s), who reviewed and recommended approval, and who finally approved the document for distribution.
- All documents should be dated, provided with a revision number and reference number, filed systematically, and retained for a five-year period.

The Contractor must ensure that documents are periodically reviewed and revised, *where necessary*, and that current versions are available at all locations where operations essential to the functioning of the EMPr are performed. All documents must be made available to the ECO and other independent external auditors.



## 10 ENVIRONMENTAL AWARENESS

**According to APPENDIX 4 of GN R 326, an EMPr must include:**

- (m) An environmental awareness plan describing the manner in which –
  - (i) The applicant intends to inform his or her employees of any environmental risk which may result from their work; and
  - (ii) Risks must be dealt with in order to avoid pollution or the degradation of the environment; and

**Part B: Section 1 of GN R 435** details impact management actions for environmental awareness training which must be complied with.

The Contractors must ensure that their employees and any third party, who carries out all or part of the Contractors' obligations, are adequately trained with regard to the implementation of the EMPr and the general environmental legal requirements and obligations. Training should be conducted by the ECO where necessary.

Environment and health awareness training programmes should be targeted at three distinct levels of employment, i.e. the executive, middle management and labour. Environmental awareness training programmes should contain the following information:

- The names, positions and responsibilities of personnel to be trained;
- The framework for appropriate training plans;
- The summarised content of each training course; and
- A schedule for the presentation of the training courses.

The ECO must ensure that records of all training interventions are kept in accordance with the record keeping and documentation control requirements as set out in this EMPr. The training records must verify each of the targeted personnel's training experience.

The Developer must ensure that adequate environmental training takes place. All employees must be given an induction presentation on environmental awareness and the content of the EMPr. The presentation needs to be conducted in the language of the employees to ensure it is understood. The environmental training must, as a minimum, include the following:

- The importance of conformance with all environmental policies;
- The environmental impacts, actual or potential, of their work activities;
- The environmental benefits of improved personal performance;



- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the Agency's environmental management systems, including emergency preparedness and response requirements;
- The potential consequences of departure from specified operating procedures;
- The mitigation measures required to be implemented when carrying out their work activities;
- Environmental legal requirements and obligations;
- Details regarding floral/faunal species of special concern and protected species, and the procedures to be followed should these be encountered during the construction of approach roads or construction camps;
- The importance of not littering;
- The importance of using supplied ablution facilities;
- The need to use water sparingly;
- Details of and encouragement to minimise the production of waste and re-use, recover and recycle waste where possible; and the
- Details regarding archaeological and/or historical sites which may be unearthed during construction and the procedures to be followed should these be encountered.

***Recommended Environmental Education Material is provided in Appendix 2.***

## 10.1 MONITORING OF ENVIRONMENTAL TRAINING

The Contractor must monitor the performance of construction workers to ensure that the points relayed during their introduction have been properly understood and are being followed. If necessary, the ECO and / or a translator should be called to the site to further explain aspects of environmental or social behaviour that are unclear. Toolbox talks are recommended.



# 11 CLOSURE PLANNING

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**Final site cleaning** - the contractor must clear and clean the site and ensure that all equipment and residual materials not forming part of the permanent works is removed from site before issuing the completion certificate or as otherwise agreed.

**Rehabilitation** - the contractor (landscape architect/horticulturist) must be responsible for rehabilitating and re-vegetation of all areas disturbed/areas earmarked for conservation during construction to the satisfaction of the engineer and ECO.

## 11.1 POST-CONSTRUCTION AUDIT

A post-construction audit must be carried out and submitted to DEA at the expense of the developer. Objectives should be to audit compliances with the key components of the EMPr, to identify main areas requiring attention and recommend priority actions. The audit should be undertaken annually and should cover a cross section of issues, including implementation of environmental controls, environmental management and environmental monitoring.

Results of the audits should inform changes required to the specifications of the EMPr or additional specifications to deal with any environmental issues which arise on site and have not been dealt with in the current document.

## 11.2 GENERAL REVIEW OF EMPr

The EMPr will be reviewed by the ECO on an on-going basis. Based on observations during site inspections and issues raised at site meetings, the ECO will determine whether any procedures require modification to improve the efficiency and applicability of the EMPr on site.

Any such changes or updates will be registered in the ECO's record, as well as being included as an annexure to this document. Annexures of this nature must be distributed to all relevant parties.



## 12 CONCLUSIONS

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All foreseeable actions and potential mitigations and/or management actions are contained in this document; the EMPr should be seen as a day-to-day management tool. The EMPr thus sets out the environmental and social standards, which would be required to minimise the negative impacts and maximise the positive benefits of the sub-transmission line as detailed in the BAR and associated specialist reports. The EMPr could thus change on a regular basis, and if implemented effectively, will reduce the environmental and social risks associated with the planning & design, construction, operational and decommissioning phases of the project.

All attempts should be made to have this EMPr available, as part of any tender documentation, so that the Engineers and Contractors are made aware of the potential cost and timing implications needed to fulfil the implementation of the EMPr, thus adequately costing for these.



**APPENDIX A: CURRICULUM VITAE OF THE EAP**

Profile – Personal Details	
Name	Dr Alan Robert Carter
Location	East London, Eastern Cape Province
Comparable Projects	
<p><b>Environmental Impact Assessment, Feasibility and Pre-feasibility Assessments</b></p> <ul style="list-style-type: none"> <li>Managed numerous projects and prepared environmental impact assessment (EIA) reports in terms of relevant EIA legislation and regulations for development proposals including: Infrastructure projects: bulk water and waste water, roads, electrical, mining, ports, aquaculture, renewable energy (solar and wind), industrial processes, housing developments, golf estates and resorts, etc. (2002 – present).</li> <li>Projects have also included preparation of applications in terms of other statutory requirements, such as water-use and mining licence /permit applications.</li> <li>Managed projects to develop pre-feasibility and feasibility assessments for various projects, including various tourism developments, infrastructure projects, etc.</li> <li>Managed project for the East London Industrial Development Zone (ELIDZ) to develop a Conceptual Framework for a Mariculture Zone within the ELIDZ (2009).</li> <li>Managed pre-feasibility study to establish a Mariculture Zone within the Coega Industrial Development Zone (2014).</li> <li>Assisted City of Johannesburg in the process to proclaim four nature reserves in terms of relevant legislation (2015-2016).</li> <li>Acted as Environmental Control Officer (ECO) for numerous projects including solar and wind farms, roads, industrial processes, etc.</li> </ul> <p><b>Strategic Environmental Assessment</b></p> <ul style="list-style-type: none"> <li>Managed Strategic Environmental Assessment (SEA) project toward the development of a Biofuel Industry in the Eastern Cape Province of South Africa (2014-2016)</li> <li>Managed Strategic Environmental Assessment (SEA) projects for two South African ports (2006 – 2007).</li> <li>Managed Strategic Environmental Assessment (SEA) projects for five (5) local municipalities in the Eastern Cape as part of the municipal Spatial Development Framework plans (2004 – 2005).</li> <li>Involved in the financial assessment of various land-use options and carbon credit potential as part of a larger Strategic Environmental Assessment (SEA) for assessing forestry potential in Water Catchment Area 12 in the Eastern Cape of South Africa (2006).</li> </ul> <p><b>Climate change, emissions trading and renewable energy</b></p> <ul style="list-style-type: none"> <li>Participated in the development of a web-based Monitoring &amp; Evaluation (M&amp;E) system for climate change Mitigation and Adaptation in South Africa for National Department of Environmental Affairs (DEA) (2015-2016).</li> <li>Managed project to develop a Climate Change Strategy for Buffalo City Metro Municipality (2013).</li> <li>Managed projects to develop climate change strategies for two district municipalities in the Eastern Cape Province (2011).</li> <li>Conducted specialist carbon stock and greenhouse gas emissions impact and life cycle assessment as part of the Environmental, Social and Health Impact Assessment for a proposed sugarcane to ethanol project in Sierra Leone (2009 - 2010) and a proposed Jatropha bio-diesel project in Mozambique (2009 - 2010).</li> <li>Managed project to develop the Eastern Cape Province Climate Change Strategy (2010).</li> </ul>	



- Managed project to develop a Transnet National Ports Authority Climate Change Risk Strategy (2009)
- Participated in a project to develop a Renewable Energy roadmap for the East London Industrial Development Zone (ELIDZ) (2013).
- Participated in a project for the East London Industrial Development Zone (ELIDZ) and Eastern Cape Government to prepare a Renewable Energy Strategy (2009).
- Contributed to the development of Arthur Andersen LLP's International Climate Change and Emissions Trading Services (2001).
- Conducted carbon credit (Clean Development Mechanism - CDM) feasibility assessment for a variety of renewable energy projects ranging from biogas to solar PV.
- Participated in the preparation of CDM applications for two solar PV projects in the Eastern Cape.

#### **Waste Management**

- Managed project to develop Integrated Waste Management Plans for six local municipalities on behalf of the Sarah Baartman District Municipality in the Eastern Cape Province (2016).
- Managed project to develop Integrated Waste Management Plans for four local municipalities on behalf of Alfred Nzo District Municipality in the Eastern Cape Province (2015).
- Managed project to develop Integrated Waste Management Plans for eight local municipalities on behalf of Chris Hani District Municipality in the Eastern Cape Province (2011).
- Managed a project to develop a zero-waste strategy for a community development in the Eastern Cape Province (2010).
- Managed waste management status quo analysis for a District Municipality in the Eastern Cape Province (2003).
- For three consecutive years, managed elements of the evaluation of the environmental financial reserves of the three largest solid waste companies (Waste Management, Inc., Republic Services, Inc., Allied Waste, Inc.) and number of smaller waste companies in the USA as part of the annual financial audit process for SEC reporting purposes. Ensured compliance with RCRA and CERCLA environmental regulations.
- Managed elements of the evaluation of the environmental financial reserves of the largest hazardous waste company in the USA (Safety-Kleen, Inc.), as part of the audit process for SEC reporting purposes. Ensured compliance with RCRA and CERCLA environmental regulations.

#### **Environmental Due Diligence and Business Risk**

- Conducted environmental due diligence projects on behalf of the German Development Bank for a forestry pulp and paper operation in Swaziland (2010) and for a large diversified South African agricultural/agro-processing company (2011)
- Managed project for the Transnet National Ports Authority to identify the environmental risks and liabilities associated with the operations of the Port of Durban as part of a broader National initiative to assess business and financial risks relating to environmental management (2006).
- Managed project to determine the financial feasibility of various proposed tourism developments for the Kouga Development Agency in the Eastern Cape Province (2006)
- Contributed significantly to a study to determine the financial and environmental feasibility of three proposed tourism development projects at Coffee Bay on the Wild Coast (2004).
- Conducted sustainability and cost/benefit analysis of various waste water treatment options (including a marine pipeline at Hood Point) for the West Bank of East London (2004).
- Conducted analysis of permit fees and application processing costs for off-road vehicle use on the South African coastline for the Department of Environmental Affairs and Tourism, Marine & Coastal Management (2003).



- Involved in the determination of the historical cost element of environmental remediation insurance claims for a number of multinational companies, including Dow Chemicals, Inc. and International Paper, Inc.
- Evaluated the environmental budgeting process of the US Army and provided best practice guidance for improving the process.

#### **Policy and Guidelines**

- Managed project to develop a Coastal Management Programme for Amathole District Municipality, Eastern Cape (2015 – 2016).
- Managed project to develop a sustainability diagnostic report as part of the development of the Eastern Cape Development Plan and Vision 2030 (2013)
- Managed project for the Department of Environmental Affairs and Tourism, Marine & Coastal Management to determine the cost implications associated with the implementation of the Integrated Coastal Management Act (2007).
- Managed project to develop a Conservation Plan and Municipal Open Space System (MOSS) for Buffalo City Municipality (2007)
- Managed project to develop a Sanitation Policy and Strategy for Buffalo City Municipality, Eastern Cape (2004 – 2006).
- Managed project to develop an Integrated Environmental Management Plan and Integrated Coastal Zone Management Plan for Buffalo City Municipality, Eastern Cape (2004 – 2005).
- Managed projects to develop and implement an Environmental Management System (EMS) for the Chris Hani and Joe Gqabi (formerly Ukhahlamba) District Municipalities in the Eastern Cape generally in line with ISO14001 EMS standards (2004 – 2005).
- Managed project to develop a State of the Environment Report and Environmental Implementation Plans for Amathole, Chris Hani, OR Tambo and Joe Gqabi District Municipalities in the Eastern Cape Province (2005 – 20010).
- Conducted analysis of permit fees and application processing costs for off-road vehicle use on the South African coastline for the Department of Environmental Affairs and Tourism, Marine & Coastal Management (2003).

#### **Environmental auditing and compliance**

- Managed project to develop an Environmental & Social Management System (ESMS) in line with IFC Performance Standards for a wind farm in South Africa (2015)
- Managed project to develop an Environmental & Social Management System (ESMS) in line with IFC Performance Standards for a telecoms company in Zimbabwe on behalf of the German Development Bank (2013)
- Participated in numerous ISO14001 Environmental Management System (EMS) audits for large South African corporations including SAPPI, BHP Billiton, SAB Miller, Western Platinum Refinery, Dorbyl Group and others (2002 – present).
- Reviewed the SHE data reporting system of International Paper, Inc. (IP) for three successive years as part of the verification of the IP SHE Annual Report, which included environmental assessments of 12 IP pulp and paper mills located throughout the USA.
- Conducted Environmental Management System (EMS) reviews for a number of large US corporations, including Gulfstream Aerospace Corporation

#### **Public financial accounting**



- While with Ernst & Young LLP, (USA), functioned as lead financial auditor for various public and private companies, mostly in the technology business segment of up to \$200 million in annual sales. Client experience included assistance in a \$100 million debt offering, a \$100 million IPO and SEC annual and quarterly reporting requirements.
- Completed three years of articles (training contract) in fulfilment of the certification requirements of the South African Institute of Chartered Accountants which included auditing, accounting and preparation of tax returns for many small to medium sized commercial entities.



## WHAT IS THE ENVIRONMENT?

- Soil
  - Water
  - Plants
  - People
  - Animals
  - Air we breathe
  - Buildings, cars and houses
- 



## WHY MUST WE LOOK AFTER THE ENVIRONMENT?

- It affects us all as well as future generations
  - We have a right to a healthy environment
  - A contract has been signed
  - Disciplinary action (e.g. construction could stop or fines issued)
-

## HOW DO WE LOOK AFTER THE ENVIRONMENT?

- Report problems to your supervisor/ foreman
- Team work
- Follow the rules in the EMP



## WORKING AREAS

Workers & equipment must stay inside the site boundaries at all times



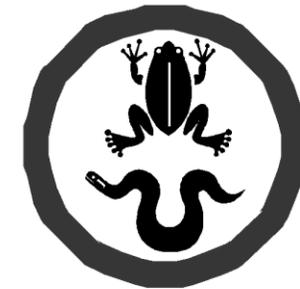
## RIVERS & STREAMS

- Do not swim in or drink from streams
- Do not throw oil, petrol, diesel, concrete or rubbish in the stream
- Do not work in the stream without direct instruction
- Do not damage the banks or vegetation of the stream



## ANIMALS

- Do not injure or kill any animals on the site
- Ask your supervisor or Contract's Manager to remove animals found on site



## TREES AND FLOWERS

- Do not damage or cut down any trees or plants without permission
- Do not pick flowers



## SMOKING AND FIRE

- Put cigarette butts in a rubbish bin
- Do not smoke near gas, paints or petrol
- Do not light any fires without permission
- Know the positions of fire fighting equipment
- Report all fires
- Do not burn rubbish or vegetation without permission



## PETROL, OIL AND DIESEL

- Work with petrol, oil & diesel in marked areas
- Report any petrol, oil & diesel leaks or spills to your supervisor
- Use a drip tray under vehicles & machinery
- Empty drip trays after rain & throw away where instructed



## DUST

Try to avoid producing dust -  
Use water to make ground & soil wet



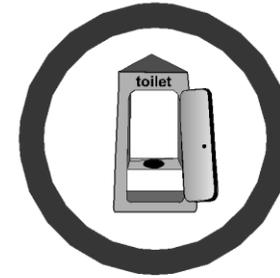
## NOISE

- Do not make loud noises around the site, especially near schools and homes
  - Report or repair noisy vehicles
- 



## TOILETS

- Use the toilets provided
  - Report full or leaking toilets
- 



## EATING

- Only eat in demarcated eating areas
  - Never eat near a river or stream
  - Put packaging & leftover food into rubbish bins
- 



## RUBBISH

- Do not litter - put all rubbish (especially cement bags) into the bins provided
  - Report full bins to your supervisor
  - The responsible person should empty bins regularly
- 



## TRUCKS AND DRIVING

- Always keep to the speed limit
- Drivers - check & report leaks and vehicles that belch smoke
- Ensure loads are secure & do not spill



## EMERGENCY PHONE NUMBERS

Know all the emergency phone numbers:

- Local Municipality:
- Ambulance:
- Fire:
- Police:

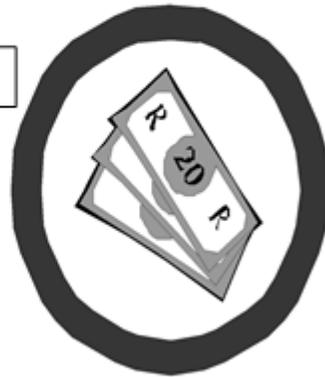


# FINES AND PENALTIES

- Spot fines of between

*To be confirmed by the*

- Your company may be fined
- Removal from site
- Construction may be stopped



## APPENDIX C: PRO-FORMA: PROTECTION OF THE ENVIRONMENT

### TO BE SIGNED BY THE CONTRACTOR

#### PRO FORMA

Employer \_\_\_\_\_  
Contract No \_\_\_\_\_  
Contract title \_\_\_\_\_

#### PROTECTION OF THE ENVIRONMENT

The Contractor will not be given right of access to the site until this form has been signed.

I/ we \_\_\_\_\_ (Contractor) record as follows:

1. I/ we, the undersigned, do hereby declare that I/ we am/ are aware of the increasing requirement by society that construction activities must be carried out with due regard to their impact on the environment.
2. In view of this requirement of society and a corresponding requirement by the Employer with regard to this Contract, I/ we will, in addition to complying with the letter of the terms of the Contract dealing with protection of the environment, also take into consideration the spirit of such requirements and will, in selecting appropriate employees, plant, materials and methods of construction, in so far as I/ we have the choice, include in the analysis not only the technical and economic (both financial and with regard to time) aspects but also the impact on the environment of the options. In this regard, I/ we recognise and accept the need to abide by the “precautionary principle” which aims to ensure the protection of the environment by the adoption of the most environmentally sensitive construction approach in the face of uncertainty with regard to the environmental implications of construction.
3. I/ we acknowledge and accept the right of \_\_\_\_\_ to deduct, should they so wish, from any amounts due to me/us, such amounts (hereinafter referred to as fines) as the Resident Engineer and Environmental Site Officer must certify as being warranted in view of my/ our failure to comply with the terms of the Contract dealing with protection of the environment, subject to the following:
  - 3.1 The Resident Engineer and Environmental Officer, in determining the amount of such fine, must take into account *inter alia*, the nature of the offence, the seriousness of its impact on the environment, the degree of prior compliance/non-compliance, the extent of the Contractor’s overall compliance with environmental protection requirements and, in particular, the extent to which he considers it necessary to impose a sanction in order to eliminate/reduce future occurrences.
  - 3.2 The Resident Engineer and Environmental Officer must, with respect to any fine imposed, provide me/ us with a written statement giving details of the offence, the facts on which the

Resident Engineer and Environmental Officer has based his assessment and the terms of the Contract (by reference to the specific clause) which has been contravened.

Signed \_\_\_\_\_

CONTRACTOR

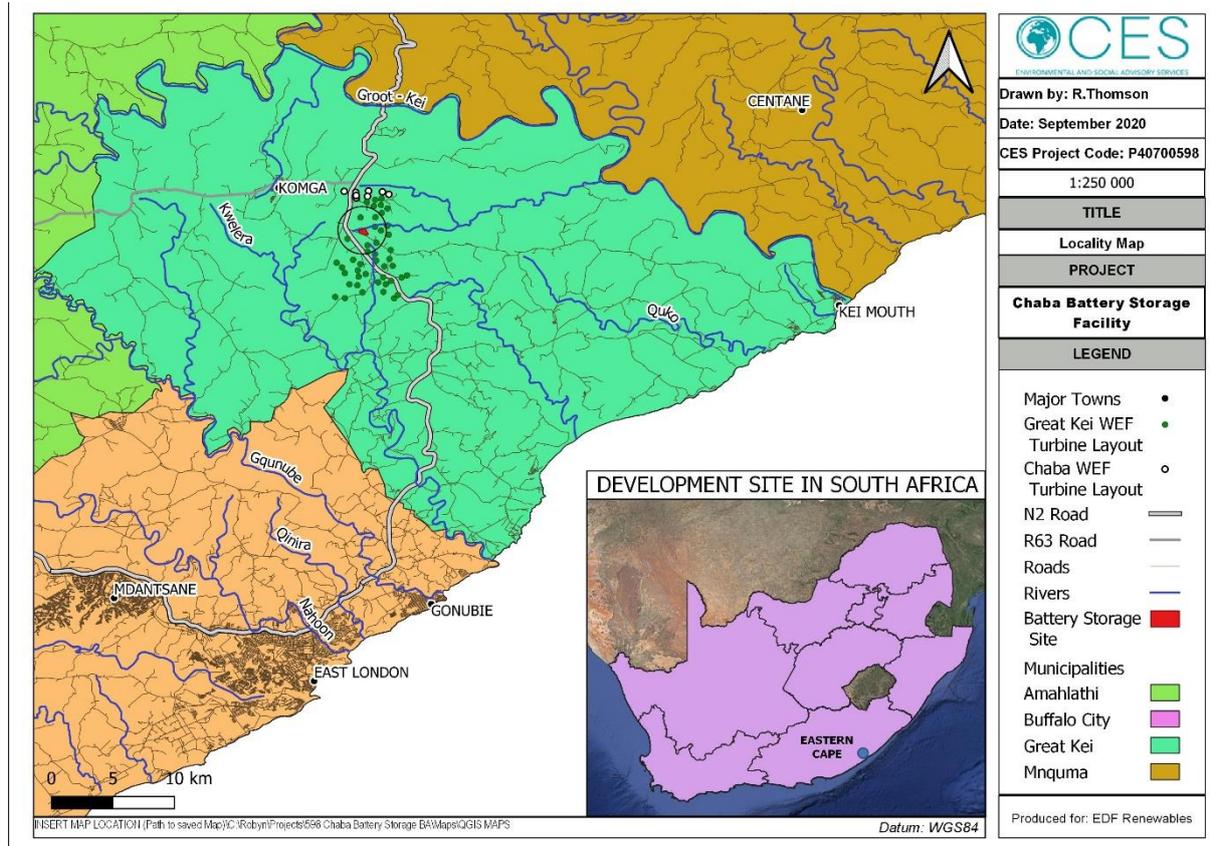
Date \_\_\_\_\_

## APPENDIX D: PROJECT LOCATION DETAILS

The proposed Battery Energy Storage System (BESS), associated with the Chaba and Great Kei Wind Energy Facilities (WEF), is located near Komga in the Great Kei Local Municipality (GKLM) within the Amathole District Municipality (ADM) of the Eastern Cape Province.

**Table 12-1: 21-Digit Surveyor General (SG) Code of the affected property.**

FARM NAME	21 DIGIT SG NUMBER	PORTION/FARM NUMBER	LOCAL MUNICIPALITY
Farm 162	C04000000000016200001	Portion 1	Great Kei Local Municipality



**Figure 12-1 Chaba BESS Locality Map**