PROPOSED DEVELOPMENT OF A SWITCHYARD AND POWERLINE IN BETHLEHEM, FREE STATE PROVINCE

Environmental Management Program

February 2018

Prepared for:

Bethlehem Hydro

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LIST OF ACRONYMS AND ABBREVIATIONS

CER	-	Contractors Environmental Representatives
DEA	-	Department of Environmental Affairs
DESTEA	-	Department of Economic, Small Business, Tourism and Environmental Affairs
DWS	-	Department of Water and Sanitation
ECO	-	Environmental Control Officer
EIA	-	Environmental Impact Assessment
EIR	-	Environmental Impact Report
EMPr	-	Environmental Management Program Report
EPC	-	Engineering Procurement Contractor
ERAP	-	Emergency Response Action Plan
ESA	-	Environmental Site Agent
I&AP's	-	Interested and Affected Parties
IDP	-	Integrated Development Plan
NEMA	-	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEM:BA	-	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NHRA	-	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NSBA	-	National Spatial Biodiversity Assessment
NERSA	-	National Energy Regulator of South Africa
NWA	-	National Water Act, 1998 (Act No. 36 of 1998)
PHRA	-	Provincial Heritage Resources Agency
PPP	-	Public Participation Process
SAHRA	-	South African Heritage Resources Agency
SDF	-	Spatial Development Framework

GLOSSARY OF TERMS

Alien species: A plant or animal species introduced from elsewhere: neither endemic nor indigenous.

Proponent: Any person who applies for an Authorisation to undertake an activity or undertake an Environmental Process in terms of the Environmental Impact Assessment Regulations – National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as contemplated in the scheduled activities listed in Government Notice (GN) No R. 327, 325 and 324.

Biodiversity: The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.

Cumulative Impact: In relation to an activity, cumulative impact means the impact of an activity that in it-self may not be significant, but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Ecology: The study of the interrelationships between organisms and their environments.

Environment: All physical, chemical and biological factors and conditions that influence an object.

Environmental Impact Assessment: In relation to an application, to which Scoping must be applied, means the process of collecting, organising, analysing, interpreting and communicating information that is relevant to the consideration of the application.

Environmental Impact Report: In-depth assessment of impacts associated with a proposed development. This forms the second phase of an Environmental Impact Assessment and follows on from the Scoping Report.

Environmental Management Programme: A legally binding working document, which stipulates environmental and socio-economic mitigation measures that must be implemented by several responsible parties throughout the duration of the proposed project.

Heritage resources: This means any place or object of cultural significance. See also archaeological resources above.

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

Precipitation: Any form of water, such as rain, snow, sleet, or hail that falls to the earth's surface.

Red Data species: All those species included in the categories of endangered, vulnerable or rare, as defined by the International Union for the Conservation of Nature and Natural Resources.

Riparian: The area of land adjacent to a stream or river that is influenced by stream induced or related processes.

Soil compaction: Soil becoming dense by blows, vehicle passage or other type of loading. Wet soils compact easier than moist or dry soils.

Solid Waste: All solid waste, including construction debris, hazardous waste, excess cement/concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic, packets and wrappers).

Spoil: Excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works.

Topsoil: A varying depth (up to 300mm) of the soil profile irrespective of the fertility, appearance, structure, agricultural potential, fertility and composition of the soil.

1 INTRODUCTION

This Environmental Management Programme (EMPr)describes the mitigation measures and identifies the specific role players that will be responsible for implementation of the mitigation measures, in order to ensure that impacts on the environment are minimised during the construction, operational and decommissioning phases of the proposed development of a 11 kV Overhead powerline and a switchyard in Bethlehem, Free State Province.

This EMPr must form part of the contractual agreement between the relevant Contractor(s) and the Developer/Proponent.

1.1 NEMA Regulation 19(4) Report Compliance

Regulation 19(4) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) Environmental Impact Assessment (EIA) Regulations of 2017 provides the content requirements for Environmental Management Programmes. The table below lists the relevant requirements, indicates whether the relevant information is included in this report or not and provides cross-references as to where the relevant information can be found in this report.

Reg.	EMPr Content	Included (Yes, No or N/A)	Report Section Reference
(a)	A draft environmental management programme must comply with section 24N of the Act and include - details of:		
	(i) the person who prepared the environmental management programme; and	**Yes**	**Chapter 3**
	(ii) the expertise of that person to prepare an environmental management programme;	**Yes**	**Chapter 3**
(b)	A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	**Yes**	**Chapter 4**
(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;	**Yes**	**Chapter 2**

Reg.	EMPr Content	Included (Yes, No or N/A)	Report Section Reference
(d)	A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including – (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and, (v) where relevant, operation activities;	**Yes**	**Chapter 9**
(e)	A description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	**Yes**	**Chapters 7 and 9**
(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; and, (iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	**Yes**	**Chapter 9**
(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	**YES**	**Chapter 9**
(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	**YES**	**Chapter 7**
(i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	**YES**	**Chapter 9**
(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);	**YES**	**Chapter 9**
(l)	A program for reporting on compliance, taking into account the requirements as prescribed by Regulations;	**YES**	**Chapter 7**
(m)	An environmental awareness plan describing the manner in which – (i) the Proponent intends to inform his or her employees of any environmental risk which may result from their work; and, (ii) risk must be dealt with in order to avoid pollution or the degradation of the environment; and,	**YES**	**Chapter 8**

Reg.	EMPr Content	Included (Yes, No or N/A)	Report Section Reference
(n)	Any specific information that may be required by the Competent Authority.	-	-

Table 1: Environmental Management Programme requirements in terms of Regulation 19(4) of the EIA Regulations of 2014.

1.2 Report Layout

The table below summarises the content layout of this report.

Chapter	Chapter Heading	Content Summary
1	Introduction	Provides a brief background to the proposed project, and explains the compliance of this report with regards to Regulation 33 of the NEMA.
2	Environmental Assessment Practitioner	Provides details of the EAP who prepared this EMPr, and provides information on the expertise of the EAP.
3	Project Description and Listed Activities Covered by this EMPr	Provides a brief project description, and describes the relevant project phases and the NEMA Listed Activities triggered.
4	Existing Environmental and Impact Assessment Summary	Summarises the biophysical, social, economic and cultural aspects of the existing environment, and provides a summary of the impact assessment outcome.
5	Persons Responsible for Implementing this EMPr	Provides information on the persons who will be responsible for implementing this EMPr, and explains requirements with regards to on-site communication, site instruction entries, method statements, and record keeping.
6	Monitoring, Performance Assessment and Reporting on EMPr Compliance	Provides information on monitoring, performance assessment and reporting on EMPr Compliance, ECO site inspection reports, and photographs.
7	Environmental Awareness Plan	Provides information on environmental awareness and risk training, and basic rules of conduct. Also provides an environmental risk plan.
8	Impacts and Mitigation Measures	Provides EMPrs for the relevant project phases.
9	Emergency Response Plan	Provides information on the emergency response plan.
10	Incident Register	Stipulates the content requirements for incident registers.
11	Rehabilitation Measures and Closure Plan	Provides rehabilitation measures and closure plan objectives.
12	Prevent Triggering of Further Listed Activities	Warns the proponent not to contravene the NEMA by engaging in unauthorised NEMA Listed Activities.
13	References	Lists all references referred to in this EMPr.

Table 2: Summary of report content layout.

2 MAP OF THE PROPOSED ACTIVITY

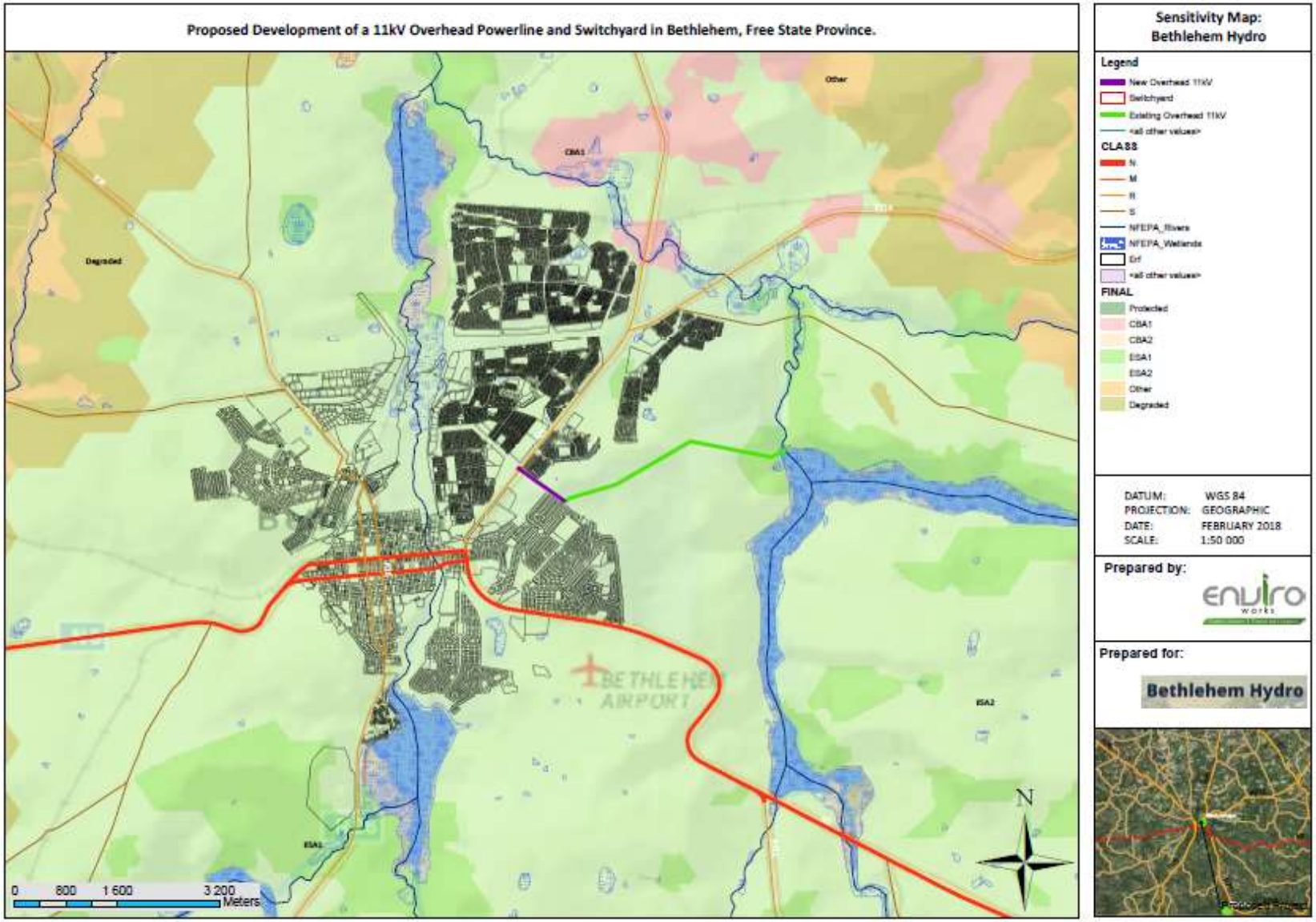

Figure 1: Sensitivity Map of the Proposed Area

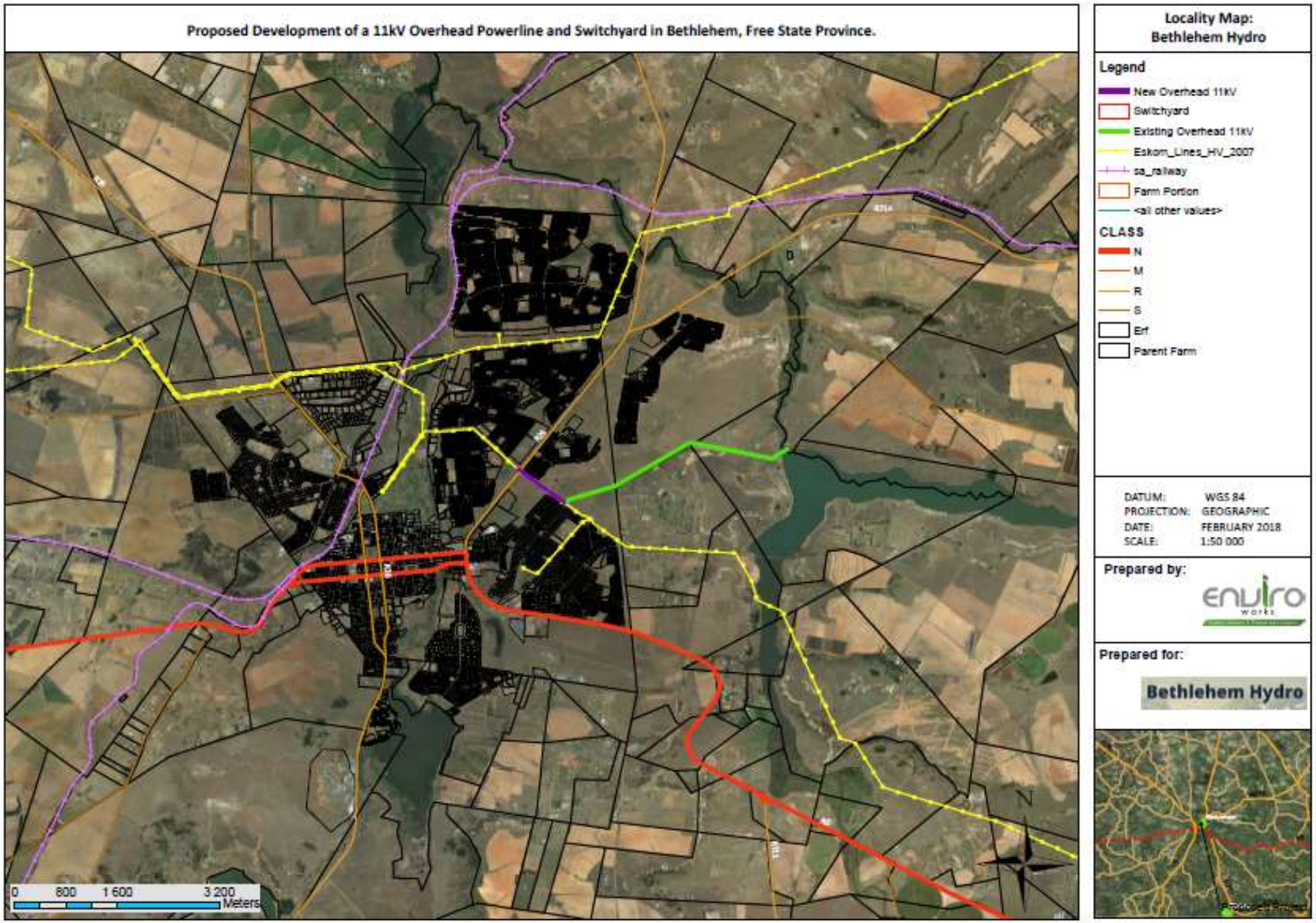

Figure 2: Layout Map of the Proposed Area

3 ENVIRONMENTAL ASSESSMENT PRACTITIONER

This Environmental Management Programme Report was prepared by Christoff du Plessis from Enviroworks, the Environmental Assessment Practitioner (EAP) who is undertaking this EIA process. The sections below provide the details of the EAP, and explain the EAP's expertise to prepare this EMPr.

3.1 Details of the EAP

Business name of EAP:	Enviroworks
Physical address:	Suite 204, Hibernian Towers, Beach Road, Strand, 7140
Postal address:	Suite 338, Private Bag X15, Somerset West
Postal code:	7129
Telephone:	021 853 0682
E-mail:	christoff@enviroworks.co.za
Fax:	086 601 7507

3.2 Expertise of the EAP

Name of EAP	Education qualifications	Professional affiliations	Experience at environmental assessments (yrs)
Christoff du Plessis	B.Sc Environmental Geography	IAIA; SAGIC	3 years

3.3 Curriculum Vitae of the EAP

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Christoff du Plessis

RELEVANT QUALIFICATIONS

Baccalaureus Scientiae (B.Sc.) in Environmental Geography: University of the Free State (2014)

Baccalaureus Scientiae (B.SC) Honours in Environmental Management: University of South Africa (2018)

WORK EXPERIENCE

January 2015 – Present: Environmental Specialist at Enviroworks

KEY PROJECT EXPERIENCE

Environmental Impact Assessment Experience

- Environmental Impact Assessment for the proposed 171ha expansion of Nalisview Cemetery in Bloemfontein on behalf of Mr. Jannie Nel

BASIC ASSESSMENT EXPERIENCE

- Construction of 30 Broiler Houses and an Abattoir, Leipoldtville, Western Cape Province (Mocke Poultry).
- Dewetsdorp Reservoir System Augmentation, Dewetsdorp, Free State Province (Bloemwater).
- Construction of the Palmiet Truck Stop, Vrede, Free State Province (DeStudio Town Planning).
- Section 24G for the unlawful operation of a Recycling Centre, Swellendam, Western Cape Province (Agri-World Recyclers).
- Construction of a 3.2 kilometre pipeline and associated infrastructure, Olifantshoek, Northern Cape Province (Ghamagara Local Municipality).
- Construction of 4 telecommunication masts, Cape Town, Western Cape Province (Highwave Consultants).
- Installation of a 90 000l LPG Cylinder, Bloemfontein, Free State Province (EASIGAS).
- Installation of a 45 000l LPG Cylinder, East London, Eastern Cape Province (EASIGAS).
- Upgrade of Day-visitor facilities at Kraalbaai, West Coast National Park, Western Cape Province (SANParks).
- Development of the Phalaborwa Wildlife Activity Hub, Kruger National Park, Limpopo Province (SANParks).
- Periodic maintenance of National Route 2 Section 4 between Riviersonderend (Km 0.0) and Swellendam (Km 56.9), Western Cape Province (SANRAL).

- Proposed development of the Klein Mooimaak Rest Camp Facility, West Coast National Park (SANParks).
- Proposed development of the 35m Buffeljagsrivier Monopole Mast, Western Cape Province (Coast to Coast Towers).
- Compilation of a River Maintenance Management Plan for Bath River, Caledon, Western Cape Province (Theewaterskloof Local Municipality).
- Proposed development of a 12.5 ha cemetery, Grabouw, Western Cape Province (Theewaterskloof Local Municipality).
- Proposed development of Hostels and Orientation Centres, Mapungubwe National Park, Limpopo Province (SANParks).
- Proposed upgrade of the R27 Gate & Geelbek Restaurant, West Coast National Park, Western Cape Province SANParks).
- Proposed development of the 25m Joostenbergvlakte Monopole Mast, Western Cape Province (Coast to Coast Towers).
- Proposed development of 30 Chicken Houses and an Abattoir, Odendaalsrus, Free State Province (Chridel Consulting).
- Design, Rehabilitation / Improvement, Routine Maintenance works of N220: Chissano to Chibuto and N/C Crz. N220 to N1, Mozambique (World Bank).
- Proposed development of a Curro Castle on Portion 54 of the Farm Blue Hills No. 397, Midrand, Gauteng Province (Curro Holdings).
- Proposed development of a 25m Monopole Mast on Portion 25 of the Farm Klein Bottelary No. 17, Brackenfell, Western Cape Province (Coast to Coast Towers).

EXPERIENCE IN PERMITS AND LICENCING

- Water Use License (General Authorisation) for the expansion of a cemetery by more than 2500 m^2 (Jannie Nel).
- Water Use License for 30 Broiler Houses and Abattoir, Leipoldtville, Western Cape Province (Mocke Poultry).
- Waste Management License and Section 24 G report for Agri World Recycling, Swellendam, Western Cape Province (Agri-World Recycling).
- Water Use License (General Authorisation) for the construction of a 3.2km pipeline, Olifantshoek, Northern Cape Province (Ghamagara Local Municipality).

ENVIRONMENTAL CONTROL OFFICER (ECO)

- The construction of the Cecilia Park powerline and sub-station, Bloemfontein, Free State Province (Centlec).
- The construction of a dual carriageway and bridge from Mthatha up to and including the Ngqeleni interchange of Provinsial Road 61 Section 8, Eastern Cape Province.
- The construction of a road from Moretele to Khaukhwe, North West Province (Department Public Works).
- The construction of a 14km water pipeline, Botshabelo, Free State Province (Bloemwater).

- The construction of a sub-station, Bloemfontein, Free State Province (Centlec).
- The rehabilitation of bridges on National Route 14: Upington to Kuruman, Northern Cape Province (SANRAL).
- The rehabilitation of the Theekloof Pass, Fraserburg, Northern Cape.
- Annual Audit on the Waste Management License for Elgin Fruit Juice, Grabouw, Western Cape (Elgin Fruit Juice).
- Reseal of Diversional Road 1468, 1470, 1473 and Minor Road 5873 on behalf of Actophambili, Witzenberg, Western Cape Province.
- Reseal of Section MR 201 and MR 305 on behalf of Actophambili, Wolsely, Western Cape Province.
- Reseal of the National Route 1, on behalf of Actophambili, Leeu Ghamka, Western Cape Province (SANRAL).
- The widening of Pella Road on behalf of the City of Cape Town, Atlantis, Western Cape Province (City of Cape Town).
- The widening of structures over the Orange River on National Route 12 Section 9 near Hopetown, Northern Cape Province (SANRAL).
- The construction of a bulk water supply reservoir, Olifantshoek, Northern Cape Province (Ghamagara Local Municipality).
- Rehabilitation of the Donkergat Road within the West Coast National Park on behalf of BVI Procurement Management Engineers, Western Cape Province (Department of Defence & Department of Public Works).
- Periodic Maintenance of National Route 2 Section 4 between Swellendam and Riviersonderend, Western Cape Province (SANRAL).

VISUAL IMPACT ASSESSMENT (VIA):

- Phalaborwa Wildlife Activity Hub, Kruger National Park, Limpopo Province (SANParks).
- 4.9ha Sand Mine on Portion 5 of the Farm Doornekraal No. 830, Western Cape Province (Greenmined).
- Proposed development of the Harvard Powerline, Bloemfontein, Free State Province (Centlec).
- Proposed development of the 35m Buffeljagsrivier Monopole Mast, Buffeljagsrivier, Western Cape Province (Coast to Coast Towers).
- Proposed development of the 25m Robertson Monopole Mast, Robertson, Western Cape Province (Coast to Coast Towers).
- Proposed development of the Klein Mooimaak Rest Camp Facility, West Coast National Park (SANParks).
- Proposed development of a Sand Mine near Malmesbury, Western Cape Province (Greenmined).
- Proposed upgrade of the R27 Gate and Geelbek Restaurant, West Coast National Park, Western Cape Province (SANParks).
- Proposed development of the 25m Roodekrans Monopole Mast, Krugersdorp, Gauteng Province (Coast to Coast Towers).
- Proposed development of a 25m Monopole Mast on Portion 25 of the Farm Klein Bottelary No. 17, Brackenfell, Western Cape Province (Coast to Coast Towers).

WETLAND DELINEATION STUDIES:

- Development of 13 borrow pits along National Road 8, Ladybrand, Free State Province (SANRAL).
- Development of a 12.5ha cemetery on Erf 4233, Western Cape Province (Theewaterskloof Local Municipality).
- Proposed development for the proposed Alfred Nzo Agri-Hub, Cederville, Eastern Cape Province (Department Public Works).

STORMWATER MANAGEMENT PLANS:

- Stormwater Management Plan for a Recycling Plant on Erf 5273, Swellendam, Western Cape Province (Agri-World Recycling).
- Stormwater Management Plan for the proposed Granite Mine on the Remaining Extent of the Farm Biesjesfontein No. 218, Springbok, Northern Cape Province (Greenmined Environmental).
- Stormwater Management Plan for the proposed Six Layer Hen Houses on the Remaining Extent of the Farm Helena 1492, Bloemfontein, Free State Province (Katawa Trading).

OTHER EXPERIENCE

- Conducting the Public Participation Process on the Draft Management Plan for the Goukamma Nature Reserve Complex, Western Cape Province (Cape Nature).
- Compilation of an Environmental Management Plan and a Risk Assessment for the pressure testing of a 1 000 000 litre LPG Cylinder within the Port Elizabeth Harbour, Eastern Cape Province (EASIGAS).
- Compilation of an Environmental Management Plan for the development of two billboards, Bloemfontein, Free State Province (Outdoor Network).
- Decommissioning Audit for the closure of a warehouse, Cape Town, Western Cape Province (Wheatherford).
- GIS mapping and technical for various projects, including the drawing of locality, sensitivity, and alien and invasive management maps.
- Public Participation Processes and assistance to several projects.

4 PROJECT DESCRIPTION AND LISTED ACTIVITIES COVERED BY THIS EMP-R

4.1 Brief Project Description

Bethlehem Hydro (PTY) Ltd (the Proponent) proposes the construction of a 11kV overhead powerline and a switchyard in Bethlehem, Free State Province. Bethlehem Hydro is planning to change its interconnection to the Eskom grid. At present, the plant is directly connected via a dedicated line to the Dihlabeng/Bethlehem Municipality's Panorama sub-station. The Proponent for now wishes to connect directly into the Eskom grid. The following will apply to the development:

- The line and switchyard will be developed by the Proponent; where-after, ownership will be transferred to Eskom;
- The proposed development will be constructed on Municipal owned land;
- The switchyard will be forty metres (40m) in length and fifty metres (50m) in width leading to a development footprint of two thousand square metres (2000m^2);
- The switchyard will not house any transformers and will be entirely fenced. Two buildings of approximately four metres (4m) by five metres (5m) will be developed with medium voltage equipment support. The entire switchyard will be gravelled; and,
- An access road of approximately one kilometre (1 km) in length and six metres (6m) wide.

4.2 Project Phases

Two phases:

- Construction Phase (includes planning, design, pre-construction and construction activities); and,
- Operational Phase.

4.3 NEMA Listed Activities Triggered

The NEMA EIA Listed Activities (as per the NEMA EIA Regulations Listing Notices 1, 2 and 3 of 2017) that will most likely be triggered by the proposed project are listed in the table below.

Listed Activity	Project Activity / Component
Government Notice Regulations of 2017	
The proposed development will not trigger any Listed Activities.	

Table 3: Listed Activities applicable to this application.

5 EXISTING ENVIRONMENTAL AND IMPACT ASSESSMENT SUMMARY

The sections below summarise the existing environment, and the outcome of the impact assessment that was undertaken for the proposed project.

5.1 The Receiving Environment

The application area consists of undulating topography due to numerous “koppies” situated towards the west as well as the north. The surrounding land-uses consist of open land, medium and low density residential areas as well as an informal settlement situated towards the west. Situated towards the north-east of the proposed development are three municipal reservoirs. From an ecological point of view the vegetation within the area is described as degraded. The proposed development will tie in with the existing powerlines situated within the area.

6 PERSONS RESPONSIBLE FOR IMPLEMENTING THIS EMPR

The “Responsibility” columns in the impact and mitigation tables provided below indicate which team member(s) are responsible for implementation of the identified mitigation measures; these team members include the following:

- Construction contractor(s);
- Construction manager;
- Proponent / Developer; and the
- Designated Environmental Officer

The sections below further list supplementary measures, which must also be implemented by the relevant team members.

During the **construction phase**, the **construction Contractor** will:

- Be responsible to have the EMPr available on site at all times;
- Provide the Proponent with a “Method Statement” which will indicate the procedures that will be applied in order to meet the requirements of any aspect of the EMPr; and
- Ensure that all problems identified during environmental inspections, are addressed and rectified as soon as reasonably possible.

During the **construction phase**, the **Contract Project Managers** will:

- Have the authority to stop work and issue fines;
- Receive reports from the ESA and report to the client;

- Enforce contractor obligations to the EMP-r; and,
- Support the ESA in his/her roles and responsibilities.

During the **construction phase**, the **Environmental Site Agent** will:

- Meet with the contractor and project manager to hand over the site and go through the content of the EMP-r, including the "do's and don'ts" of the project, to ensure that the parties understand their responsibilities to the EMP-r;
- Be accountable for monitoring and auditing activities to ensure compliance with the EMP-r;
- Work correctively with other role-players, but not be influenced in opinion and must report to the Proponent only;
- May, in the event of there being a serious threat to or impact on the environment, correspond with the contract project manager to stop work;
- Complete an ECO checklist after each site inspection and distribute this to the project team within 5 days; and,
- Conduct a final environmental audit of the project on completion of construction and rehabilitation.

During the **operational phase** the **Proponent/Developer**, will be responsible to prevent negative environmental impacts, and as such will be responsible to:

- Set aside a budget for maintenance;
- Maintain all facilities and infrastructure in good working order to effectively fulfil its intended purpose and to prevent negative environmental impacts;
- Not construct any additional buildings, infrastructure, etc. without consulting an Environmental Assessment Practitioner;
- To immediately remedy any aspects that contribute to negative environmental impacts.

6.1 On-site Communication

The following sections describe the site communication measures that will need to be implemented.

6.1.1 Site Instruction Entries

The Site Instruction book must be used for the recording of general site instructions as they relate to the works on site. It must also be used for the issuing of **stop work orders** for the purposes of immediately halting any particular activities of the Contractor in lieu of the environmental risk that they may pose.

6.1.2 Method Statements

Method statements from the Contractor will be required for specific sensitive actions on request by the authorities or the ESA.

A method statement forms the baseline information on which work in sensitive environments takes place and is a "live document" allowing for modifications to be negotiated between the Contractor and ECO / Engineer, as circumstances unfolds.

A method statement describes the scope of the intended work, step-by-step, in order for the ESA and Engineer to understand the Contractor's intentions. This will enable them to assist in devising any mitigation measures, which would minimise environmental impact during these tasks. For each instance wherein it is requested that the Contractor submit a method statement to the satisfaction of the ECO, the format must clearly indicate the following:

- **What** – a brief description of the work to be undertaken;
- **How –** a detailed description of the process of work, methods and materials;
- **Where –** a description/sketch map of the locality of work (if applicable); and
- **When –** the sequencing of actions with due commencement dates and completion date estimates.

All method statements will form part of the EMPr documentation and are subject to all terms and conditions contained within the EMPr main document.

The Contractor must submit the method statement to the ECO at least fourteen days (14d) before any particular construction activity is due to start. Work may not commence until the method statement has been approved by the Engineer/ECO.

6.1.3 Record Keeping

All records related to the implementation of this EMPr (e.g. site instruction book, method statements) must be kept together in an office where it is safe and can be retrieved easily. These records must be kept for two years and must at any time be available for scrutiny by any relevant authorities.

6.2 Monitoring

Several monitoring actions are proposed which would be undertaken by various project role players. For detail on these actions, "Responsible Person/Party", and "Monitoring Frequency" associated with the identified mitigation measures, refers to the "Monitoring" column in the impact assessment below (Chapter 8).

6.3 Performance Assessment and Reporting on EMPr Compliance

A suitably-qualified Environmental Control Officer (ECO) must be appointed by the Proponent / Developer to oversee the implementation of the construction phase mitigation measures described in this EMPr.

The ECO may not be someone appointed by the contractor, engineer or other party involved with this project, other than the Proponent / Developer.

The following applies, amongst others, to the ECO's role:

- The ECO must undertake **bi-monthly (twice a month) site visits** during the **construction phase**,
- The ECO must **report to** the Proponent / Developer only.
- The ECO must present an **environmental site induction** / **awareness training session** to all personnel before work on site commences, as are also described below; and
- After completion of the construction activities, an environmental audit must be undertaken by the ECO, before commencement of the operational phase, in order to determine compliance with the EMPr.
- The ECO can recommend the stopping of works if in his/her opinion there is a serious threat to, or impact on the environment, caused directly from the construction operations. This authority is to be limited to emergency situations where consultation with the Engineer or Proponent is not immediately available. In all such work stoppage situations the ECO is to inform the engineer and Proponent of the reasons for the stoppage as soon as possible.

Upon failure by the contractor or his employee(s) to show adequate consideration to the environmental aspects of this contract, the ECO may recommend to the engineer to have the contractor's representative or any employee(s) removed from the site or work suspended until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the contractor.

6.3.1 ECO Site Inspection Reports

The ECO site inspection reports (also called "ECO checklists") will report on the compliance of the construction phase mitigation measures contained in the EMPr. The report must be submitted to the Proponent, within five (5) days of the ECO site inspection, and must be made available to the Construction Contractor. Copies of the inspection reports must be kept on site.

The Contractor's meeting minutes must reflect environmental queries, agreed actions and dates of eventual compliance. These minutes form part of the official environmental record.

6.3.2 Photographs

It is recommended that photographs are taken of the site prior to, during and immediately after construction as a visual reference. These photographs must be stored with other records related to this EMPr. If captured in digital format, hard copies, in colour, must be kept with all other records relevant to the implementation of this EMPr.

7 ENVIRONMENTAL AWARENESS PLAN

7.1 Environmental Awareness and Risk Training

All contractor team members involved in work on site are to be briefed on their obligations towards environmental controls and methodologies in terms of this EMPr, prior to work commencing. The briefing will usually take the form of an on-site talk and demonstration by the ECO. The education / awareness programme must be aimed at all levels of management within the contractor team. See "basic rules of conduct" below.

7.1.1 Basic Rules of Conduct

The following list represents the basic *Do's* and *Don'ts* towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks. These are not exhaustive and serve as a quick reference aid.

NOTE: ALL new site personnel must attend an environmental awareness/induction presentation. Please inform your foreman or manager if you have not attended such a presentation or contact the ECO.

DO:

- Clear your work areas of litter and building rubble at the end of each day – use the waste bins provided and prevent litter from being blown away by wind.
- Report all fuel or oil spills immediately and stop the spill from continuing.
- Dispose of cigarettes and matches carefully, so to prevent veld fires (arson and littering is an offence).
- Confine work and storage of equipment to within the immediate work area.
- Use all safety equipment and comply with all safety procedures.
- Ensure a working fire extinguisher is immediately at hand if any "HOT WORK" is undertaken e.g. welding, grinding, gas cutting etc.
- Prevent excessive dust and noise.

DO NOT:

- Do not litter - report dirty or full facilities, i.e. full dustbins and dirty or blocked toilets.
- Do not make any fires.
- Do not enter any fenced off or demarcated areas.
- Do not allow waste, litter, oils or foreign materials into any storm water channels or drains or watercourses.
- Do not litter or leave food lying around.

8 IMPACTS AND MITIGATION MEASURES

A number of potential environmental impacts that may arise during the project have been identified. These are outlined in the following table below, and guidelines and mitigation measures are provided.

The Contractor must familiarise himself with the requirements of the EMPr, keeping in mind that other site-specific requirements as outlined in the Environmental Authorisation must also be complied with.

8.1 Construction Phase Environmental Management Programme

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A 11KV OVERHEAD POWERLINE AND SWITCHYARD IN BETHLEHEM, FREE STATE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
1. **ACTIVITY:** PERMITS AND AUTHORISATIONS				
1.1	**Aspects:** Legislative compliance. **Impact:** Non-compliance with South African environmental legislation. **Objective:** Ensure compliance with all triggered environmental legislation. **Target:** Commence site establishment with all permission and approvals received and on hand.	Developer	**Monitoring Action:** Obtain copies of all permits; Record Keeping **Responsible Person/Party:** Bethlehem Hydro **Monitoring Frequency:** Monthly	
	Mitigation/Management Measures: a. The Developer is to have the following permits on commencement: • Environmental Management Program; and, • Building approval from the Municipality; b. Environmental File inclusive of: • Environmental Policy; • Method Statements of Activities; • Public Complaints Register; • Emergency Telephone Numbers; • Environmental Awareness Training; • Environmental Do's and Don'ts; • Hazardous Substance Register; • Hazardous Waste Disposal Register;			

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	• MSDS of all Hazardous Substances; • Environmental Incidents Register; • Toolbox Talks; • Environmental Compliance Reports; and, • Final Environmental Compliance Report.			
2. **ACTIVITY:** SITE LAYOUT PLANNING				
2.1	**Aspects:** Site Layout Plan. **Impact:** Negative impact on the environment of unmanaged and unplanned placement of Infrastructure. **Objective:** To ensure acceptable impact and management of environmental issues at the main site and storage site during construction by proper planning of layout of infrastructure placement. **Target:** All areas not demarcated for construction must remain vegetated and the impact must be minimised.	Developer	**Monitoring Action:** Record Keeping **Responsible Person/Party:** Contract Project Manager / Engineer **Monitoring Frequency:** Once off	
	Mitigation/Management Measures: a. Draw up and submit for approval a Site Layout Master Plan. This plan must show the final positions and extent of all permanent and temporary site structures and infrastructure; b. The planning for layout must be done in consultation on-site with the Environmental Control Officer (ECO); c. The Contractor may not deface, paint, damage or mark any natural features situated in or around the site for survey or other purposes; d. The Contractor must ensure that all construction personnel, labourers and equipment remain within the demarcated construction sites at all times; e. No servicing of vehicles may be permitted on site, unless for emergency purposes;			

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	f. Stockpiles may not be situated in such a manner that they obstruct pathways; g. Location of storage area must take into account prevailing winds, distance to water bodies and general on-site topography; h. Place infrastructure as far as possible on sites that have already been transformed; i. Facilities may not be used as staff accommodation; j. The Contractors camp layout must take into account availability of access for deliveries and services and any future works; k. The Contractors camp must be of sufficient size to accommodate the needs of all sub-contractors that may work on the project; and, l. The Contractor must implement the following as required: • Suitable sanitation facilities, adequate for the number of staff on site (1 for every 15 personnel and 1 for each gender); and, • Facilities for solid waste collection.			
3. **ACTIVITY:** CONSTRUCTION PROGRAMME / SCHEDULE				
3.1	**Aspects:** Project Management. **Impact:** Order and timing of construction activities and associated impacts. **Objective:** To Provide a clear indication of the order by which key construction activities will transpire. **Target:** Anticipate timing of impacts to coordinate the availability of any specialists and/or authorities who may be required to conduct site inspections.	Contract Project Manager / Contractor	**Monitoring Action:** Meetings; Risk Register; ECO Audit Checklist; Photographs	

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	Mitigation/Management Measures: a. Draw up and sign off a project schedule with all contributing parties and service providers to commit to a timeline during which time construction milestones will be completed; b. Communicate any deviation from this schedule with all parties, so as to provide parties with sufficient opportunity for alternative arrangements to be made; c. Establish a risk register to identify and monitor potential factors which may result in setbacks/ delays on tasks within the project schedule; d. Hold management meetings with representatives of the project manager, contractor, engineer and other contributing parties to monitor and anticipate changes; and, e. Should circumstances/ incidents arise which may pose a risk to the project schedule, the construction contractor, and engineer and ECO are to keep records of this and the latter communicate this in the ECO Bi-Monthly Audit Checklist.		**Responsible Person/Party:** Contract Project Manager / Contractor / ECO **Monitoring Frequency:** Once off	
4. **ACTIVITY:** COMMUNICATION WITH LAND-OWNERS				
4.1	**Aspects:** Landowner Consent. **Impact:** Disturbance of existing land use. **Objective:** Maintain a conflict-free relationship with landowners / users. **Target:** No complaints received from landowners / users of affected property.	Contract Project Manager / Contractor	**Monitoring Action:** Meetings; Risk Register.	

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	Mitigation/Management Measures: a. Landowners are to be aware and in agreement of site access arrangements; b. The landowner has to be requested to liaise with the site supervisor of the construction contractor prior to entering the construction footprint area for safety purposes; c. All property gates are to be kept closed when not in use (or kept in the open/closed state in which it was found); and, d. Any complaint or liaison with regard to environmental aspects, compensation or disorder to economic activities, must not be addressed by the contractor. A public complaint register must be kept on site and the contract project manager must inform the Developer and/or ECO to take further action.		**Responsible Person/Party:** Contract Project Manager / Contractor / ECO **Monitoring Frequency:** Monthly	
5. **ACTIVITY:** SITE ESTABLISHMENT				
5.1	**Aspects:** Demarcation of the site and vegetation removal. **Impact:** Direct impact on vegetation during construction and loss of species. **Objective:** Prevent unnecessary habitat destruction. **Target:** All areas not demarcated for construction must remain vegetated.	Construction contractor	**Monitoring Action:** ECO to take photographs of site before clearance; ECO Audit Checklist. **Responsible Person/Party:** ECO Contractor ESA	
	Mitigation/Management Measures: a. No natural surfaces are to be marked other than using droppers, beacons or other artificial object; b. Ensure the upkeep of demarcation boundaries throughout the period of construction until rehabilitation has been completed; c. Construction areas must be fenced; d. Keep areas affected to a minimum, strictly prohibit any disturbance outside the demarcated foundation footprint area; e. Clear as little indigenous vegetation as possible, aim to maintain vegetation where it will not interfere with the			

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	construction or operation of the development, rehabilitate an acceptable vegetation layer according to rehabilitation recommendations of the relevant EMPr, if possible; f. There must be a pre-construction environmental induction for all construction staff on site to ensure that basic environmental biodiversity principles are adhered to; g. Restoration measures will be required to reinstate functionality in the disturbed soil and vegetation; and, h. No vegetation may be gathered for the purpose of creating fire.		**Monitoring Frequency:** Bi-Monthly	
5.2	**Aspects:** Topsoil stripping and conservation. **Impact:** Destruction of topsoil. **Objective:** Conserve and protect topsoil from erosion and destruction for adequate use during rehabilitation processes. **Target:** Original topsoil condition/quality maintained.	Construction contractor	**Monitoring Action:** ECO Audit Checklist; Photographs; **Responsible Person/Party:** ECO Contractor ESA **Monitoring Frequency:** Bi-Monthly	
	Mitigation/Management Measures: a. In the absence of a distinguishable topsoil layer, strip the uppermost 300 mm of soil; b. Stockpile topsoil separately from subsoil, in heaps no higher than 2m; c. Topsoil stockpiles are to be kept free of alien and invasive species; d. Limit unnecessarily prolonged exposure of stripped areas and stockpiles; e. Topsoil stockpiles to be placed on a levelled area and measures to be implemented to safeguard the piles from being washed away in the event of heavy rains/ stormwater; f. Topsoil need to be stored in designated areas only. This need to be planned and indicated on the approved site-layout plan; g. Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction/			

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	earthworks in that area (phased approach); h. Strip and stockpile herbaceous vegetation, overlying grass and other fine organic matter along with the topsoil; i. Ensure that topsoil is not mixed with subsoil and/or any other excavated material; j. Temporarily stored topsoil must be re-applied within 6 months, topsoil stored for longer need to be managed according to a detailed topsoil management plan; k. Topsoil must be used in all rehabilitation activities, and may not be compacted to ensure that its plant support capacity remain of high quality; l. Do not strip topsoil when it is wet; m. Do not mix topsoil obtained from different sites, unless the ECO gives permission; n. Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified and completed before any development or clearing; o. Permits (if applicable to the development) must be obtained from the Competent Authority prior to the cutting or clearing of the affected species, and must be filed within the Environmental file; and, p. The Environmental Report must confirm that all identified species have been rescued and replanted.			
6. **ACTIVITY:** SITE INFRASTRUCTURE PLACEMENT AND OPERATION				
6.1	**Aspects:** Structures and lay-down areas. **Impact:** Deterioration of site features and surrounding areas. **Objective:** Prevent the deterioration of site features like soil, rainwater runoff and erosion. **Target:** The preservation of site conditions evident on establishment of structures and lay-down areas.	Construction contractor	**Monitoring Action:** Photographs; ECO Audit Checklist	

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	Mitigation/Management Measures: a. Locate all structures and storage areas, including offices, workshops and stores in approved locations are per the approved Site Layout Plan; b. The camp with storage and laydown areas are to be kept secure and neat with access control measures adopted during construction; c. A vehicle service area should be in place (if required), for vehicle repairs, in such a way that no spillages will occur into the environment; d. Clearly define which activities are to occur within which areas of the site by erecting signage; and, e. All hazardous substances, such as fuel, oil, diesel, paint, etc., must be stored in a secondary containment system (trays or bund) which is capable of storing at least 110% of the liquid capacity. If bund areas are used, it must be sealed to avoid seepages.		**Responsible Person/Party:** ECO Contractor ESA **Monitoring Frequency:** Bi-Monthly	
7. **ACTIVITY:** CONSTRUCTION SITE OPERATIONS				
7.1	**Aspects:** Security and fencing. **Impact:** Prevent danger to trespassing of persons. **Objective:** Keep the site secure from trespassing or theft and keep animals out. **Target:** Site remains secure during construction with no incidences of trespassing, theft and injury or death to animals.	Construction contractor	**Monitoring Action:** Photographs; ECO Audit Checklist **Responsible Person/Party:** ECO Contractor ESA	
	Mitigation/Management Measures: a. Be responsive to open or closed status of gates; b. New or the upkeep of fences must be align to ensure safety of animals and maintain a reliable boundary area; c. Limit clearing of vegetation for fencing to the removal of trees and shrubs within 1 m of the fence line. All undergrowth			

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	must be maintained; d. Should construction activities require the removal of fences or gates to execute tasks, this must be replaced as soon as possible following completion; and, e. In all cases, the landowners on whose property any use of fences or gates, must be consulted, to ensure that parties are informed of construction activity, schedules and vehicle movement.		**Monitoring Frequency:** Bi-Monthly	
7.2	**Aspects:** Existing Services and Infrastructure. **Impact:** Damage to existing services and infrastructure. **Objective:** No damages to existing services and infrastructure. **Target:** No damages to existing services and infrastructure.	Construction contractor	**Monitoring Action:** Photographs; ECO Audit Checklist **Responsible Person/Party:** ECO Contractor ESA **Monitoring Frequency:** Bi-Monthly	
	Mitigation/Management Measures: a. Take cognisance of the position of existing services and infrastructure (e.g. roads, pipelines, power lines and telephone services) that may get damaged due to construction activities; b. Use existing roads as far as practically possible; c. Ensure that existing services are not damaged or disrupted unless required by the contract and with the permission of the project manager; and d. In the event that infrastructure is damaged or services interrupted during construction, it will be done at the expense of the Contractor and shall receive top priority over all other activities.			
7.3	**Aspects:** Traffic. **Impact:** Traffic capacity increase and overload. Unregulated movement of machinery during the construction phase. **Objective:** Minimise the disruption of road users. Safe and efficient traffic regulation during the construction phase.	Construction contractor	**Monitoring Action:** Incident Register; Photographs; ECO	

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	Target: Minimal disruption of road users. **Mitigation/Management Measures:** a. All vehicles must be road-worthy and drivers must be qualified, made aware of the potential road safety issues, and need for strict speed limits; b. Vehicles used for transport of materials and sand must be fitted with tarpaulins to prevent the release of such material or items onto road surfaces; c. Construction vehicles may not leave the designated roads and tracks and turnaround points must be limited to specific sites; d. Abnormal loads must not be transported after dark; e. Abnormal loads must be timed to avoid times of year when traffic volumes are likely to be higher, as would be expected over national holidays, weekends and school holiday periods; f. Only authorised roads and access routes may be used by construction personnel and equipment; g. Transport of materials must be limited to the least amount of trips possible; and h. Traffic deviations around the construction area must be planned in conjunction with the local authority to ensure safe and free flow of traffic. Safety signs must be utilised.		Audit Checklist **Responsible Person/Party:** ECO Contractor ESA **Monitoring Frequency:** Bi-Monthly	
7.4	**Aspects:** Traffic. **Impact:** Traffic impacts associated with the movement of construction vehicles on site. **Objective:** To minimise the destruction of biodiversity, compaction of valuable topsoil and mortalities of fauna on site. **Target:** Minimal destruction of biodiversity, compaction of valuable topsoil and mortalities of fauna on site.	Construction contractor	**Monitoring Action:** Incident Register; Photographs; ECO Audit Checklist	

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Mitigation/Management Measures: a. During construction create designated turning areas and strictly prohibit any off-road driving or parking of vehicles and machinery outside designated areas; b. Monitor the establishment of (alien) invasive species and remove as soon as detected, before regenerative material can be formed; c. Abnormal loads and machinery must avoid movement over gravel roads during and immediately after rainfall events, so as to limit destruction of road surfaces and sedimentation of downhill rivers/streams; d. All vehicles must be road-worthy, be maintained to prevent fuel or oil leaks and drivers are to the licensed appropriately for the driving of their assigned vehicle. Drivers responsible for the transportation of personnel must be specifically licensed to do so; e. Construction vehicles may not leave the designated roads and tracks, whilst U-Turns are prohibited on all roads; f. Signage is to be placed on vehicles at all times; g. All construction vehicles must adhere to construction sites and avoid off road to minimise impact on vegetation and soil; h. After decommissioning, if access roads or portions thereof will not be of further use to the landowner, remove all foreign material and rip area to facilitate the establishment of vegetation, followed by a suitable revegetation program; **i.** Construction-related vehicles and machinery may not operate on site without reflective safety signage, car-top lights and reflective personnel gear. **j.** Access to the servitude and tower positions must be negotiated with the relevant landowner and must fall within the assessed and authorised area;		**Responsible Person/Party:** ECO Contractor ESA **Monitoring Frequency:** Bi-Monthly	

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	k. The access roads to tower positions must be signposted after access has been negotiated and before the commencement of the activities; **l.** Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the Contractors expense; **m.** Maximum use of both existing servitudes and existing roads must be made; **n.** All private roads used for access to the servitude must be maintained and upon completion of the works, be left in at least the original condition; **o.** Access is to be established by vehicles passing over the same track on natural ground, multiple tracks are not permitted; and, **p.** Upon completion of development, only roads as indicated by the Project Manager must be closed.			
7.5	**Aspects:** Erosion Control. **Impact:** Loss of topsoil, formation of bare soil and deterioration of habitat quality. **Objective:** Prevent soil erosion. **Target:** No signs of significant soil erosion should be evident on site.	Construction contractor	**Monitoring Action:** Incident Register; Photographs; ECO Audit Checklist **Responsible Person/Party:** ECO Contractor ESA **Monitoring Frequency:**	
	Mitigation/Management Measures: a. Disturb as little ground area as possible, stabilize that area as quickly as possible, control drainage through the area, and trap sediment on site; b. Conserve topsoil with its leaf litter and organic matter, and re-apply this material to local disturbed areas to promote the growth of local native vegetation; c. Apply erosion control measures before the rainy season begins and after each season of construction, preferably			

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	immediately following construction; and, d. During periods of strong winds and heavy rain, the stockpiles should be covered with appropriate material (e.g. cloth, tarpaulin etc.); e. Where possible sandbags (or similar) should be placed at the base of the stockpiled material in order to prevent erosion of the material; and, f. Maintain and reapply erosion control measures until vegetation is successfully established.		Bi-Monthly	
7.6	**Aspects:** Handling of general – and hazardous waste materials on the construction site. **Impact:** The presence of personnel and construction operations will increase the likelihood of littering and dumping of solid waste. **Objective:** Management and disposal of general – and hazardous waste in an appropriate manner. **Target:** No record of pollution or site contamination by solid waste.	Construction Contractor	**Monitoring Action:** ECO Audit Checklist **Responsible Person/Party:** ECO Contractor ESA **Monitoring Frequency:** Bi-Monthly	
	Mitigation/Management Measures: a. An adequate number of scavenger proof litter bins are to be placed throughout the site. Two waste bins at least must be present, one (1) for hazardous waste and one (1) for non-hazardous waste at each working site. Dumping of waste on site is prohibited; b. Waste sorting and separation must form part of the environmental induction and awareness programme, to encourage personnel to collect waste paper, glass and metal waste separately; c. Keep all work sites including storage areas, offices and workshops neat and tidy; d. Dedicate a demarcated and signposted storage area on site for the collection of construction waste; e. All domestic waste is to be removed from site and disposed of at a registered solid waste landfill site (Bethlehem			

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Landfill site); f. Bagged cement must be stored in an appropriate facility and at least 10m away from any water courses; g. Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site; h. Any excess sand, stone and cement must be removed or re-used from site on completion of the construction period and disposed at a registered disposal facility; i. Care must be taken to ensure that no waste fall off disposal vehicles on-route to the landfill. If needed, a tarpaulin can be utilised; j. The burning or burying of solid waste on site is prohibited. Do not burn PVC pipes or other plastic materials, as this is regarded as hazardous waste; k. Littering by construction workers shall not be permitted; l. Workers from the immediate area need to be encouraged to take their waste with them at the end of each day; m. General refuse/rubbish shall be removed from site on a weekly basis to an approved registered landfill site or as soon as the waste bins are reaching full capacity; n. Minimise waste by sorting wastes into recyclable and non-recyclable waste; o. Ablution facilities must be serviced by a registered service provider, cleaned at least once a week, and safe disposal slips must be on file at the site office; p. A bi-weekly (twice a week) litter patrol of the entire site shall be conducted by the designated Environmental Control Officer (ECO); q. Hazardous waste must be sorted from non-hazardous waste and disposed of at a hazardous treatment facility, records and proof of disposal must be kept; and,			

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	r. A register must be kept of the quantities of waste disposed and proof of disposal must be available at the site office.			
7.7	**Aspects:** Sewage waste. **Impact:** Pollution and site contamination due to sewage. **Objective:** Provide facilities for appropriate collection and disposal of sewage. **Target:** No record of pollution or site contamination by sewage.	Construction contractor	**Monitoring Action:** ECO to take photographs of site before clearance; ECO Audit Checklist **Responsible Person/Party:** ECO Contractor ESA **Monitoring Frequency:** Bi-Monthly	
	Mitigation/Management Measures: a. Provide portable chemical ablution facilities, situated at convenient locations in proximity to work areas. This must be in relation to the quantity of users on site, with 1 ablution facility per 15 users and for each gender; b. Locations for the placement of ablution facilities include the workshop and areas for resting and eating; c. Ablution facilities are to be maintained and cleaned regularly to ensure functionality and an adequate level of hygiene; d. Ablution facilities must be cleaned on a regular basis, safely disposed of and safe disposal slips need to be filed within the environmental file. The Contractor appointed should be registered as a professional waste removal company; e. The use of ablution facilities and/or mobile facilities must be used at all times and no indiscriminate use of the veld for the purposes of ablution must be permitted under any circumstances; f. Drinking water facilities, comprising of a water tank with a manual tap can be combined with hand washing facilities near site ablution; and, **g.** Only toilet paper is to be flushed down the chemical ablution facility. Personnel are to be informed on sanitary implementation as part of the environmental awareness.			
7.8	**Aspects:** Dust Generation and visual Impact.	Construction	**Monitoring Action:**	

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Impact: Dust nuisance from site operations and visual impact of site operations on surrounding land owners. **Objective:** To avoid dust from excavated materials and construction activity and unnecessary visual impact caused by site operations. **Target:** Minimise the incidence of dust generation and visual impact.	contractor	ECO to take photographs of site before clearance; ECO Audit Checklist **Responsible Person/Party:** ECO Contractor ESA **Monitoring Frequency:** Bi-Monthly	
Mitigation/Management Measures: a. Ensure all vehicles remain on designated roads; b. Dust masks are to be supplied to workers; c. The transfer of soil or aggregate must be done over the shortest possible distance; d. Access roads are to be kept clean; e. Surface material that is scraped off during construction must be conserved and used for rehabilitation. Any spoil material must be disposed of in a manner that appears natural; f. Lay-down area(s) must be screened with shade cloth in an earth tone or other appropriate neutral colour; g. Site offices and structures must be limited to one location and carefully situated to reduce visual intrusion. Roofs must be grey and non-reflective; h. Lights within the construction camp must face directly downwards (angle of 90˚); i. Avoid shiny materials in structures. Where possible shiny metal structures must be darkened or screened to prevent glare; j. Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re-vegetated or stabilised as soon as is practically possible; k. Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible			

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	dust plume is present; l. Vehicles speeds must not exceed 40km/h along dust roads or 20km/h when traversing unconsolidated and non-vegetated areas; m. Appropriate dust suppression measures must be used when dust generation is unavoidable e.g. dampening with water: particularly during prolonged periods of dry weather in summer. Such measures must also include the use of temporary stabilising measures (e.g. chemical soil binders, straw, bush packs, chipping); n. Litter must be strictly controlled, as the spread thereof through wind could have a very negative visual impact; and, o. The minimum amount of topsoil and vegetation must be removed during construction, must be conserved and used for final rehabilitation.			
7.9	**Aspects:** Noise Generation. **Impact:** Noise nuisance from site operations. **Objective:** To avoid excessive noise generation from site operations. **Target:** Minimise the incidence of noise generation.	Construction contractor	**Monitoring Action:** ECO to take photographs of site before clearance; ECO Audit Checklist **Responsible Person/Party:** ECO Contractor ESA **Monitoring Frequency:**	
	Mitigation/Management Measures: a. Should multiple activities result in the excessive generation of noise, it must be strived to coordinate the incidence of these at the same time; b. Fit machinery with silencers; c. All stationary noisy equipment such as compressors and pumps must be contained behind acoustic covers, screens or sheds where possible; d. The regular inspection and maintenance of equipment must be undertaken to ensure that all components function			

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	optimally; e. Vehicles must avoid the use of their reverse gear as far as possible so as to avoid the sounding of sirens. This must not be considered for temporary access routes as disturbance of adjacent vegetation is to be avoided; f. Where recurrent use of machinery is frequent, machines must be shut down during intermediate periods; g. Unless otherwise specified by the ESA, normal working hours will apply (i.e. from 07H00–18H00, Mondays to Fridays); h. No loud music is permitted on site or in the Camp; i. Ensure that Employees and staff conduct themselves in an acceptable manner while on site, both during working hours and after hours; and, j. Vehicles are to abide by speed restrictions on access roads and limit trip generation so as to minimise disturbance to surrounding land users.		Bi-Monthly	
7.10	**Aspects:** Fire Prevention. **Impact:** Uncontrollable fire and damage to surrounding areas. **Objective:** Prevent the outbreak of fires emanating from construction activity. **Target:** No incidences of fires are recorded for the site.			
	Mitigation/Management Measures: a. The potential risk of veld fires is heightened by windy conditions in the area, specifically during the dry, windy winter months; b. Assume acceptable precautions to guarantee that fires are not started as a result of works on site as specified below: the Contractor will be held responsible for any damage to structures or property on or neighbouring the Site as a result of any fire caused by personnel;	Construction contractor	**Monitoring Action:** ECO to take photographs of site before clearance; ECO Audit Checklist.	

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A 11KV OVERHEAD POWERLINE AND SWITCHYARD IN BETHLEHEM, FREE STATE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	c. The Contractor must ensure that construction related activities that pose a potential fire risk, such as welding etc., are properly managed and confined to areas where the risk of fires has been reduced. Measures to reduce the risk of fires include clearing working areas and avoiding working in high wind conditions when the risk of fires is greater. In this regard special care must be taken during the high risk dry, windy winter months; d. The Contractor must provide fire-fighting training to selected construction staff and take cognisance of the Veld and Forest Fire Act, Act No. 101, 1998; e. As per the conditions of the Code of Conduct, in the event of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor must compensate the fire-fighting costs borne by farmers and local authorities; f. Equip vehicles and site structures with fire extinguishers. Rubber beaters must be stored on site; g. No open fires are allowed anywhere on site; h. Storage of fuel or chemicals under trees is not permitted; i. Gas and liquid fuel is not to be stored in the same place; j. Smoking may only occur within a 3m radius from designated areas; k. Personnel must be adequately trained in the handling of firefighting equipment; and, l. Fuel, diesel, oil, or any other flammable substance must be stored 6m away from the smoking area.		**Responsible Person/Party:** ECO Contractor ESA **Monitoring Frequency:** Bi-Monthly	
7.11	**Aspects:** Soil and water contamination due to construction activities such as the use of hazardous materials on site. **Impact:** Pollution of soil and water contamination by hazardous waste. **Objective:** Provide facilities for appropriate collection and disposal of hazardous waste. **Target:** No record of pollution or site contamination by hazardous waste.	Construction contractor	**Monitoring Action:** Incident Register; Photographs; ECO	

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A 11KV OVERHEAD POWERLINE AND SWITCHYARD IN BETHLEHEM, FREE STATE PROVINCE	RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
Mitigation/Management Measures: a. Concrete must be mixed on mixing trays only and not on exposed soil. Concrete must be mixed only in areas which have been specially demarcated for this purpose (preferable where no natural vegetation occur); b. Concrete mixing to be carried out away from sensitive areas and on impermeable surfaces; c. Material Safety Data Sheets (MSDSs) must be available on site for all chemicals and hazardous substances to be used on-site, including information on their ecological impacts and how to minimise the impacts in case of leakage; d. All spillage must be cleaned up immediately after they have occurred; e. Spillage of petrochemical products must be avoided. In the case of accidental spillage, contaminated soil must be removed for bio-remediation or disposed of at a facility for the substance concerned. Disturbed land must be rehabilitated and seeded with vegetation seed naturally occurring on site; f. Do not locate any ablution facilities, sanitary convenience, septic tank or French drain within the 1:100 year flood line, or within a horizontal distance of 100m (whichever is greater) of a watercourse or drainage line; g. Vehicles and machinery must be regularly serviced to avoid leakages; h. At the work site the Contractor must maintain strict surveillance to ensure that no spills occur; i. No water courses may be used to clean equipment, or for bathing. All cleaning operations must take place off site at a location where waste water can be disposed of correctly; j. The discharge of any pollutants such as cement, concrete, lime, chemicals, etc. into the natural environment and the storm water system must strictly be prohibited; k. Fuel and chemical storage must be done within a designated area only, which is properly bund and able to contain 130% (110% statutory requirement plus an allowance for rainfall) of the capacity of fuel or chemicals stored within;		Audit Checklist **Responsible Person/Party:** ECO Contractor ESA **Monitoring Frequency:** Bi-Monthly	

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A 11KV OVERHEAD POWERLINE AND SWITCHYARD IN BETHLEHEM, FREE STATE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	l. Construction vehicles must be inspected every morning before work commence to ensure that no leakages do occur; m. All personnel must receive induction on how to report spillages, contain them and treat them accordingly; n. Spill kits must be available at each working station; o. The servicing of vehicles and equipment must be conducted in a dedicated service area; p. During servicing of vehicles or equipment, especially where emergency repairs are conducted outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts; q. Drip trays must be placed beneath all construction equipment that is stationary on site or within the site camp; and, r. Hazardous waste must be stored in bins with a lid in a demarcated waste area, and must be disposed of at a hazardous treatment facility with records on file.			
7.12	**Aspects:** Water Conservation. **Impact:** Wasting water as a result of negligence. **Objective:** Promote and implement water use efficiency mechanisms. **Target:** No Water Wastage. **Mitigation/Management Measures:** a. Re-use water were possible; b. Prevent leakages at taps and hoses by means of maintenance; c. Use buckets of water to clean tools instead of running water; d. Make sure that sediment, concrete, sand and rubbish does not end up going down the stormwater drain. Cover or	Construction contractor	**Monitoring Action:** Incident Register; Photographs; ECO Audit Checklist **Responsible Person/Party:** ESA Contractor ESA	

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A 11KV OVERHEAD POWERLINE AND SWITCHYARD IN BETHLEHEM, FREE STATE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	filter stormwater inlets and drains; and, e. Require workers to use a broom rather than a hose to clean paths and gutters. If water use is necessary, use high pressure hoses which are both water efficient and more effective cleaners.		**Monitoring Frequency:** Bi-Monthly	
7.13	**Aspects:** Stormwater Management. **Impact:** Discharge of stormwater into the natural environment. **Objective:** Impacts to the environment caused by stormwater and wastewater discharges during construction are avoided. **Target:** Adequate management of stormwater to ensure that the surrounding environment is not polluted. a. Appropriate pollution control facilities necessary to prevent discharge of water containing pollution matter or visible suspended materials into watercourses or water bodies must be designed and implemented; b. Runoff from the cement/concrete batching area must be strictly controlled and contaminated water must be collected, stored and either treated or disposed of off-site, at a location approved by the project manager; c. All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility; d. Natural Stormwater runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO; and, e. Water that has been contaminated with suspended solids, such as soils and slit, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the Project Manager's approval and support by the ECO.	Construction contractor	**Monitoring Action:** Incident Register; Photographs; ECO Audit Checklist **Responsible Person/Party:** ECO Contractor ESA **Monitoring Frequency:** Bi-Monthly	
7.14	**Aspects:** Assembly and Erecting of Towers.	Construction	**Monitoring Action:**	

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A 11KV OVERHEAD POWERLINE AND SWITCHYARD IN BETHLEHEM, FREE STATE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	Impact: Degradation of the environment due to the erecting and assembly of towers. **Objective:** No environmental degradation occurs as a result of assembly and erecting towers. **Target:** Environmental Sensitive areas are not negatively impacted upon. a. Prior to erection, assemble towers and tower sections must be stored on elevated surface (suggest wooden blocks) to minimise damage to the underlying vegetation; b. In sensitive areas, tower assembly must take place off-site or away from sensitive areas; c. The crane used for tower assembly must be operated in a manner which minimises impact to the environment; d. The number of crane trips to each site must be minimised; e. Wheeled cranes must be utilised in preference to tracked cranes; f. No levelling at tower sites must be permitted unless approved the Development Project Manager; g. Topsoil must be removed separately and stored for later use during rehabilitation of such tower sites; h. Topsoil must be stored in heaps not higher than 1m to prevent destruction of the seed bank within the topsoil; i. During backfilling operations, care must be taken not to dump the topsoil at the bottom of the foundation and then put spoil on top of that; and, j. The retained topsoil must be spread evenly over areas to be rehabilitated and suitably compacted to effect revegetation of such areas to prevent erosion as soon as construction activities on the site is complete. Spreading of topsoil must not be undertaken at the beginning of the dry season.	contractor	Incident Register; Photographs; ECO Audit Checklist **Responsible Person/Party:** ECO Contractor ESA **Monitoring Frequency:** Bi-Monthly	
7.15	**Aspects:** Emergency Procedures. **Impact:** Environmental degradation due to accidents that occur on site.	Construction contractor	**Monitoring Action:** Incident Register;	

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	Objective: Emergency Procedures are in place to enable a rapid and effective response to all types of environmental emergencies. **Target:** Staff is adequately trained and is aware of their duties in case of an emergency. a. Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project; b. The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation; c. All staff must be made aware of emergency procedures as part of the environmental awareness training; and, d. In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented.		Photographs; ECO Audit Checklist **Responsible Person/Party:** ECO Contractor ESA **Monitoring Frequency:** Bi-Monthly	
7.16	**Aspects:** Health and Safety. **Impact:** Dangerous working conditions for workers. **Objective:** To prevent any casualties on site. **Target:** No Personnel casualties on site. **Mitigation/Management Measures:** a. Ensure that PPE is available to Personnel; b. Adhere to the Occupational Health and Safety Act; c. Keep the first aid kit stocked; d. Issue all workers with necessary health and safety items; e. Potentially hazardous areas must be demarcated with danger tape (netting should be used for excavated areas);	Construction contractor	**Monitoring Action:** Incident Register; Photographs; ECO Audit Checklist **Responsible Person/Party:** ECO Contractor ESA **Monitoring Frequency:**	

CONSTRUCTION PHASE: PROPOSED DEVELOPMENT OF A 11KV OVERHEAD POWERLINE AND SWITCHYARD IN BETHLEHEM, FREE STATE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
	f. Appropriate signage must be placed to caution Employees and contractors not to enter certain structures without authorisation; g. Regular safety inspections must be conducted to ensure that participants are equipped with necessary safety equipment; and, h. All construction personnel to wear hard hats and reflector jackets at all times.		Bi-Monthly	
7.17	**Aspects:** Heritage Resources. **Impact:** Damage and destruction of vertebrate fossils during excavation activities. **Objective:** To prevent any destruction of valuable artefacts. **Target:** No destruction of any vertebrate fossils and artefacts.	Construction contractor	**Monitoring Action:** Incident Register; Photographs; ECO Audit Checklist **Responsible Person/Party:** ECO Contractor ESA **Monitoring Frequency:** Bi-Monthly	
	Mitigation/Management Measures: a. Should any heritage resources (including but not limited to fossil bones, coins, indigenous and/or colonial ceramics, any articles of value or antiquity, stone artefacts or bone remains, structures and other built features, rock art and rock engravings) be exposed during excavation for the purpose of construction, construction in the vicinity of the finding must be stopped. A trained palaeontologist or heritage specialist must be notified to assess the finds, and this must then be reported to the applicable heritage authority; b. Heritage remains uncovered or disturbed during earthworks must not be disturbed further until the necessary approval has been obtained from the heritage authority. A registered heritage specialist must be called to the site for inspection and removal once authority to do so, has been given; c. Excavations must be limited to the footprint area and be maintained in a narrow corridor; d. All operations of excavation equipment must be made aware of the possibility of the occurrence of sub-surface			

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heritage features and the following procedures must be followed: a. All construction in the immediate 50 m vicinity radius of the site must cease; b. The heritage practitioner must be informed as soon as possible; c. In the event of obvious human remains SAPS must be notified; d. Mitigation measures (such as refilling, etc.) must not be attempted; e. The area in a 50 m radius of the find must be cordoned off with hazard tape; e. Public access must be limited and the area must be placed under guard; f. The Furnace area must be protected and declared a no-go area until the developer appoints a suitably qualified archaeologist to conduct a Phase 2 archaeological assessment of the terrain and to draw up a heritage management plan for the site; and, g. The appointed archaeologist must apply for a valid permit from SAHRA to excavate the furnace for display and educational purposes.			

8.2 Operational Phase Environmental Management Programme

The intention of providing an EMPr for the operational phase is to provide guidelines for management of facilities and infrastructure to safeguard the environment against negative environmental impacts.

OPERATIONAL PHASE: PROPOSED DEVELOPMENT OF A 11KV OVERHEAD POWERLINE AND SWITCHYARD IN BETHLEHEM, FREE STATE PROVINCE		RESPONSIBLE PARTY/PERSON (implementation of mitigation measures)	MONITORING: ACTION, RESPONSIBLE PERSON/PARTY AND FREQUENCY	COMPLIANT? (for use by ECO)
1. **ACTIVITY:** OPERATIONAL PHASE IMPACTS				
1.1	**Aspects:** Noise Generation. **Impact:** Noise nuisance from management and maintenance work. **Objective:** To avoid excessive noise generation from maintenance work. **Target:** Minimise the incidence of noise generation and no public complaints of noise generation.	Proponent	**Monitoring Action:** Proponent to adhere to business hours. **Responsible Person/Party:** Proponent Maintenance Contractor	
	Mitigation/Management Measures: a. Machinery must be in sound mechanical condition and equipped with the necessary silencers; b. Workers on site must adhere to the prescribed working hours (7am – 6pm); c. The regular inspection and maintenance of equipment must be undertaken to ensure that all components function optimally; d. Implement a public complaints register in order to be made aware of any potential noise impacts on surrounding areas; e. Ensure that maintenance staff conduct themselves in an acceptable manner while on site, both during working hours and after hours; and, f. No loud music will be permitted on site.			
1.2	**Aspects:** Increased risk of veld fires due to the undertaking of maintenance and hot works. **Impact:** Due to maintenance hot works that may need to be conducted on the proposed towers, fires can occur if not managed to the correct standard. **Objective:** Ensure no loss of resources due to fires. **Target:** Ensure adequate fire-fighting equipment is in place and no fires within natural areas.	Proponent	**Monitoring Action:** Maintenance Contractor Checklist **Responsible**	

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	Mitigation/Management Measures: a. Ensure that the area where maintenance hot work is conducted is equipped with adequate firefighting equipment. This includes at least rubber beaters as well as a fire extinguisher of the appropriate type irrespective of the site; b. Maintenance personnel must be adequately trained in the handling of firefighting equipment, and can include but not limited to: • Regular fire prevention talks and drills; • Posting of regular reminders to staff; c. Do not store any flammable materials anywhere near where the hot works are to be undertaken; d. Assume acceptable pre-cautions to guarantee that fires are not started as a result of works on site. The maintenance contractor will be held responsible for any damage to structures or property on or neighbouring the site as a result of any fire caused by maintenance personnel; e. Maintenance vehicles should be equipped with adequate fire extinguishers as well as rubber beaters; f. In the event of a fire, the maintenance Contractor shall immediately employ such plant and personnel as is at his disposal and take all necessary action to prevent the spread of the fire and bring the fire under control; and, g. Hot works must be restricted to an area approved by the landowner as well as the maintenance contractor.		**Person/Party:** Proponent; Maintenance Contractor	
1.3	**Aspects:** Potential Avifaunal Impacts **Impact:** The height of the pylons may pose a risk to night migrating birds. **Objective:** Ensure Avifaunal Species are protected within the area. **Target:** No record of bird mortalities in close proximity to the mast.	Proponent	**Monitoring Action:** Maintenance Contractor Checklist	

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	Mitigation/Management Measures: a. Any potential bird collision and associated mortalities must be monitored and recorded on an ongoing basis. Should any mortalities be recorded, records must be reviewed by an avifaunal specialist (e.g. Endangered Wildlife Trust) to determine if any further investigation or specific mitigation measures are needed; b. Should any bird nest be found on the mast, an avifaunal specialist must be contacted to determine if any permits is required for removal and advice should be sought from the relevant Competent Authority; and, c. Bird guards and diverts must be installed on the new line.		**Responsible Person/Party:** Developer; Maintenance Contractor	
1.4	**Aspects:** Impact on the sense of place for surrounding users. **Impact:** The development of the Switchyard and powerline will cause a visual intrusion to observers within a five kilometre radius from the proposed development. **Objective:** Ensure minimal visual intrusion of the proposed development. **Target:** Aesthetic value of the surrounding is not negatively impacted upon.			
	a. Avoid shiny materials in structures. Where possible shiny metal structures should be darkened or screened to prevent glare; b. Mitigation to minimise lighting impacts include the following: c. Shielding the source of light by physical barriers (walls, vegetation or structures itself); d. Limit mounting heights of lighting fixtures, or alternatively using foot-lights or bollard level lights; e. Make use of downward directional lighting fixtures; f. Make use of minimum lumen or wattage in lights; g. Use motion sensors to activate lighting ensuring light is available when needed.herbicides.	Proponent	**Monitoring Action:** Maintenance Contractor Checklist **Responsible Person/Party:** ESA	

8.3 Impacts during the Decommissioning Phase

It is not foreseen that the proposed development will be decommissioned as electricity supply will be required for the future.

9 EMERGENCY RESPONSE PLAN

The following table is provided to assist the ECO and construction Contractor with remedial work options and problem solving:

Observation or Event	Action by Inspector or Observer	Action by Construction Contractor
Spillage of diesel or hydrocarbons on soil	Report to construction contractor and continue observations. Also check: ➢ That the source causing the spillage has ceased, and that the affected area is isolated to prevent spreading of the hazardous substance, where after it must be rehabilitated.	Action will be required as soon as possible (ASAP) by following the next steps: ➢ Dig down into the soil to see how far down the pollution penetrated, ➢ If less than 300mm penetrated: a. Turn the soil over to expose it to the air. b. Apply Mono Ammonium Phosphate (MAP) at a rate of 58gr/m² to the overturned soil. c. Water enough to keep the soil moist. ➢ If penetration is greater than 300mm: a. Remove the affected soil and spread in a layer not more than 300mm thick. b. Apply MAP at a rate of 50gr/m². c. Water enough to keep the soil moist. ➢ Repeat the above steps every 6 weeks or until the soil is clean.
Erosion	Report to construction contractor and continue observations. Also check: ➢ That all vehicular movement is restricted to	Action will be required ASAP: ➢ Implement erosion protection works at identified problem areas. ➢ Implement remedial works at affected areas in order to restore the area to its previous or better status.

Observation or Event	Action by Inspector or Observer	Action by Construction Contractor
	existing access routes to prevent crisscrossing of tracks through undisturbed areas.	

10 INCIDENT REGISTER

INCIDENT REGISTER: PROPOSED DEVELOPMENT OF A POWERLINE AND SWITCHYARD, BETHLEHEM, FREE STATE PROVINCE					
NAME OF PERSON REPORTING THE INCIDENT	**INCIDENT**	**DATE OF INCIDENT IDENTIFIED**	**HOW WAS INCIDENT ADDRESSED?**	**DATE OF RECTIFICATION**	**SIGNATURE**

11 REHABILITATION MEASURES AND CLOSURE PLAN

The rehabilitation phase follows completion of construction works and entails site clean-up and site rehabilitation following the removal of the Contractor from site. The underlying aim of rehabilitation is the process of returning land within the site boundary to some degree of its former natural state.

Key aspects within this process include the:

- Removal of structures and infrastructure;
- Handling of inert waste and rubble;
- Handling of hazardous waste and pollution control;
- Final shaping of the terrain;
- Topsoil replacement and soil amelioration;
- Ripping and scarifying of surfaces;
- Planting of indigenous occurring vegetation (if deemed necessary); and
- Maintenance.

11.1 Rehabilitation Measures

Removal of structures and infrastructure
• On completion of a section of works, the area must be rehabilitated by suitable landscaping, levelling, topsoil dressing, land preparation, alien plant eradication and where ascribed for by the ECO, vegetation establishment; • Clear and completely remove from site all construction structures and temporary infrastructure; • All permanent infrastructure must be returned to a useable state.
Inert waste and rubble
• Remove all inert waste and rubble, such as excess rock, any structural foundations and remaining aggregates. Only once this material has been removed, the site shall be re-instated and rehabilitated. • Domestic waste must be completely removed from the site and disposed of at a landfill site.
Topsoil replacement and soil amelioration
• The reinstatement of disturbed areas must follow immediately after the removal of structures and temporary infrastructure; • Topsoil backfilling must be undertaken when the soil is dry, and not following any recent rainfall events; • The replacement of topsoil must be sought in situ with construction where possible, or as soon as construction in an area has be completed; • All stockpiled topsoil together with herbaceous vegetation must be replaced and redistributed over a disturbed area such as temporary access roads; • Topsoil must be returned to the same site from where it was stripped; • When insufficient topsoil remains, soil of a similar quality can be obtained from a nearby area within the

construction area which was disturbed; • Once topsoil has been returned to the ground, stripped vegetation must be randomly spread by hand over the area.
Maintenance
• All re-growth of invasive vegetative material will be monitored by the Developer for one year; • All areas under rehabilitation are to be treated as no-go areas using danger tape and steel droppers/fencing and cordoned off, to prevent vehicular, pedestrian and livestock access. • Any re-vegetation must be done using plant species in occurrence on site; • Control invasive plant species and weeds using approved methods of manual or chemical intervention; • The re-establishment of vegetation must be allowed several rainy seasons, given the arid nature of the climate and region.