

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

**PROPOSED DEVELOPMENT OF A 154 MW BATTERY STORAGE
FACILITY ON PORTION 566 OF MOEDSGIFT FARM, EXCELSIOR,
MANTSOPA LOCAL MUNICIPALITY, THABO MOFUTSANYANE
DISTRICT, FREE STATE PROVINCE**

Report Date: 2024/07/22

PREPARED FOR:

LTM GREEN ENERGIES



PREPARED BY:

GREEN GOLD GROUP (PTY) LTD



PROJECT DETAILS

Project Title	Proposed development of a 154 MW battery storage facility on portion 566 of Moedesgift Farm, Excelsior, Mantsopa Local Municipality, Thabo Mofutsanyane District, Free State province.
Applicant	LTM Green Energies (Pty) Ltd
Environmental Assessment Practitioner	Green Gold Group (Pty) Ltd
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02		Tokollo Kobe EAPASA- Registered EAP- Registration No.2021/3499	Draft EMPr for the proposed development of a 154 MW battery storage facility on portion 566 of Moedesgift Farm, Excelsior, Mantsopa Local Municipality, Thabo Mofutsanyane District, Free State province.

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LIST OF ABBREVIATIONS AND ACRONYMS

TERMS	DEFINITIONS
S&EIR	Scoping and Environmental Impact Report
CA	Competent Authority
CBA	Critical Biodiversity Area
CBD	Central Business District
CLO	Community Liaison Officer
CoE	City of Ekurhuleni
DoE	Department of Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPR	Environmental Management Programme
EMS	Environmental Management System
GDARDE	Gauteng Department of Agriculture, Rural Development and Environment
GN	General Notice
I&AP	Interested and Affected Parties
IDP	Integrated Development Plan
IPP	Independent Power Producers
MSDS	Material Safety Data Sheet
MW	Megawatt
NCR	Non-Compliance Report
NEMA	National Environmental Management Act
NEM: WA	National Environmental Management Waste Act
PCD	Pollution Control Dam
PEM	Proton Exchange Membrane
PGM	Platinum Group Metals
PPE	Personal Protective Equipment
PPP	Public Participation Process
PV	Photovoltaic

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1. INTRODUCTION

In 2003, the Department of Energy (DoE) published its White Paper on Renewable Energy, outlining a policy aimed at integrating renewable energies into the mainstream energy economy. The initial goal was to achieve a renewable energy contribution of 10,000 GWh (0.8 Mtoe) to final energy consumption by 2013, primarily from biomass, wind, solar, and small-scale hydropower. Despite this vision, South Africa's energy requirements have largely remained dependent on fossil fuels, including coal and imported oil. To advance renewable energy, the government has supported the role of Independent Power Producers (IPPs) through the Renewable Energy IPP Procurement Programme, launched in 2011, which aims to contribute 3,725 MW while promoting socio-economic and environmental benefits.

LTM Green Energies intends to implement a comprehensive energy storage system using Huawei's LUNA ESS technology. This system features Huawei LUNA 2000-1.0MW units for high-capacity storage, DCBOX-9/5-H distribution boxes for efficient energy management, and STS-6000K-H transformers for grid integration. The design includes multiple tiers of Battery Energy Storage Systems (BESS) with a total storage capacity of 24 MWh and 154 MWh across 154 battery containers. This modular setup ensures flexibility and scalability to meet varying energy demands efficiently.

The proposed 154 MW Battery Storage Facility will be developed on Portion 566 of Moedesgift Farm in Excelsior, Ward 8, within the Masilonyana Local Municipality and Thabo Mofutsanyane District, Free State Province. The Huawei LUNA ESS will store energy during low demand and release it during peak periods, with static transfer switches ensuring uninterrupted power supply and efficient direct current distribution managed by the DCBOX-9/5-H.

This activity is listed in the Listing Notice 2 (GNR 325) of Environmental Impact Assessment (EIA) regulations, 2014 as amended. Typically, projects of this nature would require environmental authorization to comply with NEMA (Act No. 107 of 1998) as amended. However, the minister has established a norm that excludes certain activities from needing this authorization under specific conditions. The exclusion applies only to areas classified as having low or medium environmental sensitivity.

Green Gold Group has been appointed by LTM Green Energies as an independent Environmental Assessment Practitioner (EAP) to oversee the registration process for this

development. The site coordinates are Lat: 28°57'3.50" S, Long: 27° 4'10.51"E, as detailed in **Appendix A1.1**.

1.1. Purpose of EMPr

The main driving force behind the compilation of this Environmental Management Programme Report (EMPR) is to outline measures that are to be implemented in order to minimise adverse environmental impacts that are either direct, indirect or cumulative, associated with the development of the Battery storage facility. This is done by encouraging good management practices through planning, commitment of environmental issues, complying with all applicable laws, regulations, standards and guidelines for the protection of the environment. The EMPR serves as a guide, for parties involved, on their roles and responsibilities concerning environmental management on the site. Furthermore, it provides a framework for environmental monitoring throughout the development's life cycle.

This document is binding for the lifespan of the project and provides appropriate mitigation measures designed to minimise or eliminate the negative impacts that may be caused as a result of the proposed project and enhance positive impacts.

1.2. Objectives of EMPr

This EMPr provides the management actions required to reduce environmental impacts generated during the pre-construction, construction and operational activities for this proposed project, as well as providing recommendations for the rehabilitation of impacted areas.

The primary objectives of the EMPr are to:

- Provide details of the applicant;
- Provide an outline of the legal requirements;
- Facilitate compliance with regulatory authority stipulations and guidelines that may be local, provincial, national and/or international;
- Describe actions that, when effectively implemented, will provide mitigation of environmental impacts, and/or reduce the frequency of impact occurrence;
- Define organisational and administrative arrangements for environmental management and monitoring of the work contract, including the responsibilities of staff and coordination, liaison and reporting procedures;
- Ensure that discussions are held with site supervision staff regarding pro-active environmental management;

- Define procedures for environmental control in the event of an emergency incident (e.g., spillage);
- Provide guidance to preserve the topsoil, flora and fauna on the proposed area to be affected; and
- Develop standards and best practice requirements to effectively implement site rehabilitation.

2. PROJECT DESCRIPTION

LTM Green energies intend to develop a Huawei LUNA ESS battery storage system. The Huawei LUNA ESS is a comprehensive energy storage solution that includes multiple key components to ensure efficient energy management. The primary components of the proposed system include the LUNA 2000-1.0MW energy storage units, DCBOX-9/5-H distribution boxes, and STS-6000K-H static transfer switches. The system configuration includes multiple tiers of battery energy storage systems (BESS), identified as BESS-1T1, BESS-2T1, etc., arranged in a structured manner to optimize energy storage and retrieval.

Components description

a) Huawei LUNA 2000-1.0MW

The Huawei LUNA 2000-1.0MW is an energy storage system with a power capacity of 1 megawatt (MW) which can deliver significant power output, making it ideal for managing large energy demands. This system uses advanced lithium-ion batteries with high efficiency, durability, and rapid charging and discharging. The LUNA 2000-1.0MW is versatile, and it serves various functions such as:

- Stabilizing the grid,
- performing peak shaving by storing energy during low-demand periods and
- releasing it during peak times, and providing backup power during outages. use and ensure a dependable power supply.

LUNA2000-1.0MWH-1H1 (Preliminary)
Smart String ESS



- Figure 1 showing Huawei LUNA 2000-1.0MW

b) DCBOX-9/5-H

The Huawei DCBOX-9/5-H0 electric panel is an essential low-voltage solution in energy storage systems, facilitating efficient energy management between the grid and batteries. It supports connections of up to nine Smart Rack controllers to five Smart PCS units, managing up to 1 MW of power. Its design is optimized for heat dissipation, thus ensuring enhanced durability and performance.

The Huawei DCBOX-9/5-H0 electric panel accumulator is designed to enhance efficiency and safety in energy storage systems. It serves as a central node in the Smart String Energy Storage System (Smart ESS), providing DC buses that enable bidirectional energy transfer between batteries and the electrical grid. With support for multiple unit connections, the panel facilitates advanced energy management and storage capacity optimization.

With a nominal input voltage of 1,200 V and a maximum capacity of 1,500 V, the DCBOX-9/5-H0 can handle a maximum current of 321 A on the battery rack side and 193 A on the PCS side. The device includes 14 DC circuit breakers for protection against overcurrent and other electrical hazards, ensuring safe and efficient operation. The panel's design features a natural ventilation system that helps dissipate accumulated heat, thereby extending the lifespan of its components and minimizing maintenance needs.

Benefits of Huawei DCBOX-9/5-H0 Electric Panel Accumulator:

- **Efficient Energy Management:** Enables optimal energy distribution between batteries and the grid, maximizing the use of energy resources.
- **Extended Connectivity Capacity:** Compatible with up to five Smart PCS and nine battery racks, providing flexibility and scalability.
- **Advanced Protection:** Equipped with 14 DC circuit breakers, it ensures protection against voltage fluctuations and overcurrent.
- **Increased Durability:** The natural ventilation system maintains an optimal temperature, reducing component wear.
- **Strong Power Combination Capacity:** Supports up to 1 MW of power combination, ideal for large energy storage systems.
- **Versatile Compatibility:** Designed to work with the Smart String ESS LUNA2000-2.0MWH-1H1 system, facilitating integration into various storage configurations.

Technical specs:

- Applicable Smart String ESS LUNA2000-2.0MWH-1H1
- Max. Input Voltage 1,500 V
- Nominal Input Voltage 1,200 V
- Max. Branch Current for Battery Rack Side 321 A
- Max. Branch Current for PCS Side 193 A
- Number of DC Circuit Breaker 14
- Max. Input Number of Battery Rack 9
- Max. Input Number of PCS 5
- Max. Convergence Capacity 5 x 193 A

DCBOX-9/5-H0
DC LV Panel



Figure 2 depicts DCBOX-9/5-H

c) STS-6000K-H

The STS-6000K-H is a high-performance 6300 kVA LV/MV AC transformer. This device converts low-voltage AC power (800V) generated by the PV inverter into medium-voltage AC power (at range of 10 – 35 kV voltage depending on plant design) and feeds the power into the power grid. The transformer station integrates the ring main unit, transformer, low-voltage cabinet, and auxiliary power supply into a steel-structure container to provide a highly integrated power transformation and distribution solution for ground-based PV plants in medium-voltage grid-tied scenarios. The transformer station applies to the grid-tied systems in large PV plants. Typically, a grid-tied PV system consists of the PV string, SUN2000, AC combiner box/switch box, and the transformer station

STS-6000K-H1 Smart Transformer Station



Simple

Prefabricated and Pre-tested, No Internal Cabling Needed Onsite
Compact 20' HC Container Design for Easy Transportation



Efficient

High Efficiency Transformer for Higher Yields
Lower Self-consumption for Higher Yields



Smart

Real-time Monitoring of Transformer, LV Panel and RMU
High Precision Sensor of LV Electricity Parameters
Remote Control of ACB and MV Circuit Breaker



Reliable

Robust Design against Harsh Environments
Optimal Cooling Design for High Availability and Easy O&M
Comprehensive Tests from Components, Device to Solution

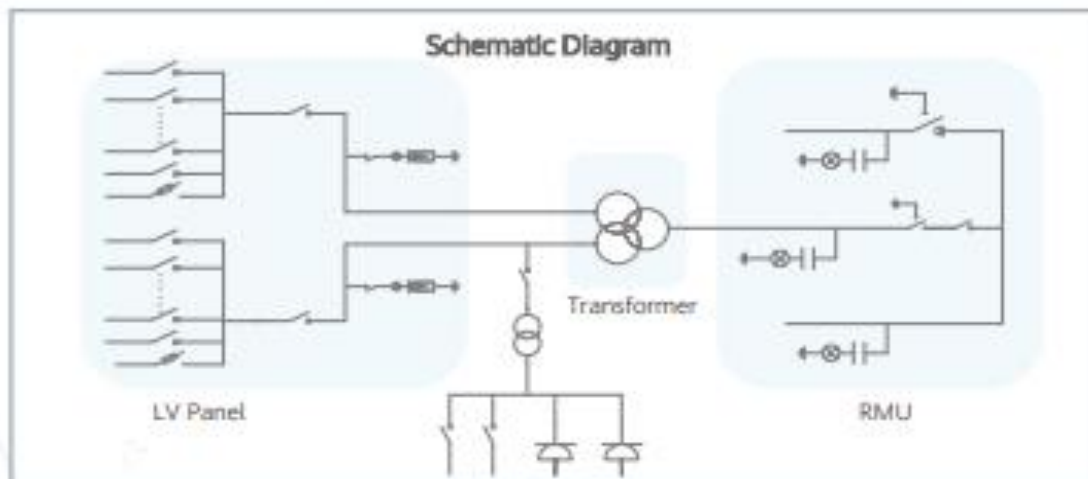


Figure 3 depicts STS-6000K-H

d) BESS Tiers

The system is organized into multiple tiers of Battery Energy Storage Systems (BESS), with each tier identified by unique labels such as BESS-1T1 and BESS-2T1. This tiered structure allows for modular expansion and scaling of the storage capacity based on the system's needs. Each tier comprises several battery modules, which collectively contribute to the overall energy storage capacity. By having multiple tiers, the system can efficiently manage and optimize energy storage, enabling it to handle varying levels of energy demand and integrate seamlessly with other system components.

e) Battery Containment Capacity (24 MWh)

The battery containment capacity of 24 megawatt-hours (MWh) represents the maximum amount of electrical energy that the system can store at any given moment from 24x of the Luna 1MWhr BESS units. In our plant design, we have aggregated power from 6x STS-6000K transformers to form a single battery containment. This capacity signifies that the system can hold up to 24 MWh of energy, which is a measure of the total amount of electricity the batteries can store for later use. This large storage capacity allows the system to accumulate a significant amount of energy during periods of low demand or excess generation, and then release that stored energy when needed, such as during peak demand or power outages.

f) Number of Battery Containment Units (7 Units)

The system consists of 7 separate battery containment units, with each unit designed to house multiple battery containers to achieve a total of 154 MWhr plant BESS capacity. Note this includes 6x complete 24 MWhr battery containment units and the 7th being a partial unit to get to the total of 154 MWhr capacity. These containment units play a crucial role in organizing and managing the batteries, as each unit acts as a central hub for its contained battery containers. This arrangement not only contributes to the overall energy storage capacity of the system but also facilitates efficient operational management and maintenance. By grouping the battery containers into these containment units, the system can effectively handle large volumes of stored energy while ensuring that the batteries are organized in a way that supports optimal performance, safety, and ease of access.

g) .Number of Battery Containers (154 Units)

The system is equipped with 154 individual Lunar 1MWhr battery BESS containers, each serving as a housing unit for multiple individual battery cells and their associated control systems. These containers are essential for the energy storage infrastructure, as they not only house the batteries but also include the necessary systems to monitor and manage the battery cells. Each battery container integrates the cells with control mechanisms that ensure efficient operation, safety, and performance. The collective setup of 154 containers enables the system

to store and manage a substantial amount of electrical energy, supporting various operational needs and contributing to the overall capacity of the energy storage solution.

h) BESS Container Details (HUAWEI LUNA2000-1.0MWH-1H1)

Each BESS container in the system is a Huawei LUNA2000-1.0MWH-1H1 model, designed to offer an energy storage capacity of 1 megawatt-hour (MWh) per container. These containers are modular in design, allowing them to be interconnected to expand the system's total storage capacity as needed. This modularity ensures flexibility and scalability, enabling the system to be tailored to meet varying energy demands by simply adding or connecting additional containers. The standardized design also facilitates ease of integration and maintenance, contributing to the overall efficiency and adaptability of the energy storage solution.

LUNA2000-1.0MWH-1H1 (Preliminary)
Smart String ESS



Figure 5 depicts Huawei LUNA2000-1.0MWH-1H1

i) DC Box (DCBOX-9/5-H0)

Each battery container in the system is paired with a DC box model DCBOX-9/5-H0, which is responsible for managing and distributing the direct current (DC) power generated by the battery container. The DC box ensures that the DC power is efficiently routed from the battery container to other system components or to the power conversion system. With 154 DC boxes in total, each one is dedicated to a specific battery container, providing precise control and protection for the DC power coming from each unit.

DCBOX-9/5-H0
DC LV Panel



Figure 6 Depicts DC Box (DCBOX-9/5-H0)

j) PCS Details (HUAWEI LUNA2000-200KTL-H0)

The Power Conversion System (PCS) is responsible for converting the stored DC power into alternating current (AC) power for grid usage. The PCS model used is the Huawei LUNA2000-200KTL-H0. The primary function of the PCS is to convert the direct current (DC) power stored in the batteries into alternating current (AC) power. This conversion is essential because most electrical grids and many end-use applications operate on AC power. The PCS ensures that the stored energy can be fed into the grid or used by AC-powered devices. The Huawei LUNA2000-200KTL-H0 is designed to handle large-scale energy storage systems. The "200KTL" in the model's name indicates that it has a power capacity of 200 kilowatts (kW), meaning it can convert up to 200 kW of DC power into AC power at any given moment. The PCS typically includes an inverter, which is the key technology responsible for the DC to AC conversion. In addition to the inverter, the PCS often features control systems that manage the conversion process, ensure grid compliance, and optimize the efficiency of power delivery.

LUNA2000-200KTL Series Smart PCS



Figure 7 PCS Details (HUAWEI LUNA2000-200KTL-H0)

k) Number of PCS Units (770 Units)

The system features 770 PCS (Power Conversion System) units, each tasked with converting direct current (DC) power from the battery containers into alternating current (AC) power. This extensive array of PCS units ensures that the system can handle a large volume of power conversion efficiently. By distributing the conversion process across 770 units, the system is capable of managing substantial energy loads and maintaining a steady supply of AC power for grid integration or direct use. This setup provides resilience and redundancy; if one PCS unit fails or needs maintenance, the remaining units can continue to operate, ensuring uninterrupted service and enhancing the overall reliability and stability of the energy storage system.

l) Battery Transformer (STS-6000K)

The Battery Transformer, specifically the STS-6000K model, is crucial for preparing the AC power generated by the system for integration with the electrical grid. Its primary function is to step up the voltage of the AC power to a level that matches the grid's requirements, ensuring compatibility and safe transmission. By elevating the voltage, the transformer allows the power to be efficiently transferred over long distances and reduces energy losses during

transmission. The STS-6000K model is designed to handle large-scale energy storage systems, providing the necessary voltage adjustment to ensure that the power can be seamlessly fed into the grid or utilized by large-scale applications.

STS-6000K-H1 Smart Transformer Station



Figure 8 depicts Battery Transformer (STS-6000K)

m) Battery Transformer Containers (26 Units)

The system includes 26 dedicated containers, each housing battery transformers essential for voltage adjustment. These containers are equipped with all necessary components to ensure that the power transformation process is efficient and effective. Inside each container, the transformers step up the voltage of the AC power to levels suitable for integration with the electrical grid. This setup allows for the management of high-capacity energy storage systems, enabling the safe and reliable delivery of power at the correct voltage. The design and configuration of the containers ensure that each transformer operates optimally, maintaining the overall efficiency and stability of the power conversion and distribution process.

n) Battery Containment Details (24MWh BESS: 24MVA)

A BESS collects energy either from renewable energy sources, such as wind and or solar panels and/or it can source electricity from the electricity network and store the energy using battery storage technology. The batteries discharge to release energy when necessary, such as during peak demands, power outages, or grid balancing. In addition to the batteries, BESS requires additional components that allow the system to be connected to an electrical network. A bidirectional inverter or power conversion system (PCS) is the main device that converts power between the DC battery terminals and the AC line voltage and allows for power to flow both ways to charge and discharge the battery. The other primary element of a BESS is an

energy management system (EMS) to coordinate the control and operation of all components in the system. The battery containment details outline that each Battery Energy Storage System (BESS) unit has a storage capacity of 24 megawatt-hours (MWh) and a power rating of 24 megavolt-amperes (MVA). This configuration indicates that each unit can store up to 24 MWh of energy, providing substantial capacity for both energy storage and supply.

For a battery energy storage system to be intelligently designed, both power in megawatt (MW) or kilowatt (kW) and energy in megawatt-hour (MWh) or kilowatt-hour (kWh) ratings need to be specified. The 12 MVA power rating ensures that the BESS unit can manage high power flows effectively, handling significant levels of electrical power during both the charging and discharging phases. The power-to-energy ratio is normally higher in situations where a large amount of energy is required to be discharged within a short time period such as within frequency regulation applications.

System configuration

The system configuration is designed to optimize both efficiency and reliability. The energy storage units, specifically the Huawei LUNA 2000-1.0MW, are linked through DCBOX-9/5-H distribution boxes, which handle the direct current connections. For seamless power source transitions, STS-6000K-H static transfer switches are employed.

The Battery Energy Storage System (BESS) is structured into several tiers:

- **Tiers:** Each tier (T1, T2, T3, T4) houses multiple BESS units, further categorized into sub-tiers (e.g., BESS-1T1, BESS-2T1).
- **Scalability:** This modular design supports scalable energy storage, adapting to different energy requirements.

2.1.PROJECT LOCATION

The proposed development will materialise within an area of approximately 21.0 Hectares (209744 square metres) on Portion 566 of the farm Moedesgift, Excelsior, Free State province. The site is situated approximately 1km north of Excelsior town in the Mantsopa Local Municipality.

Table 1: Project Location Details

Farm Name	Moedesgift farm, portion 566
Physical Address	Portion 566 of Moedesgift farm, Excelsior, Ward 8, Mantsopa Local Municipality, Free State
SG Code	F04200000000056600000
Coordinates	28°57'3.50" S, Long: 27° 4'10.51"E

Table 2: Regional setting of the site

ASPECT	DETAIL
Province	Free State
Magisterial District	Thabo Mofutsanyana District Municipality
Local Municipal Ward Number	Ward 8
Farms on which the activities take place	Portion 466 of Moedesgift Farm
Nearest town(s)	Excelsior
Surrounding communities	Agriculture and residential
Use of land immediately adjacent to farm	Agriculture and residential

The Locality map is attached as **Appendix A1.1**.

3. ROLES AND RESPONSIBILITIES

3.1. APPLICANT/ DEVELOPER

- The developer of the facility has the duty to ensure that all resources are provided to ensure that the Environmental Management Programme is always complied with.
- Shall ensure that anyone who does business with the company or entering the company premises is aware of any environmental requirements within the site to ensure that there is always compliance. The developer will ensure there is continuous monitoring of compliance in the form of both first- and second-party audits.
- May appoint project manager who can be responsible for overseeing this programme,
- Report to the environmental committee and keep them apprised on all matters pertaining to this programme
- Formalise communications to reflect current operational activities and actions and ensure that this programme is implemented and managed accordingly.
- Ensure that this programme' procedures, instructions and guidance are regularly reviewed and amended as necessary
- Actively promote a positive environmental culture throughout all areas of responsibility

3.2. PROJECT MANAGER

The Applicant may appoint a Project Manager in writing to act on their behalf in accordance to Section 16 of the Occupational Health and Safety Act, however, the liability remains with the applicant.

Once the Project Manager has been appointed by LTM Green Energies, they will be responsible for the following tasks on behalf of the applicant:

- Appointment of an Environmental Control Officer (ECO), if required before commencement of the project;
- Notify competent authority of changes in the Battery storage facility operations that may result in significant environmental impacts;
- Assess the Contractor's environmental performance with the ECO; and
- Ensure compliance with all relevant legislation.

Therefore, the Project Manager is responsible for ensuring the implementation of the EMPR and ensuring that the conditions in the authorisation are satisfied. Where construction activities are contracted out (e.g., to Contractors and Sub-contractors), the liability associated with non-

compliance still rests with the Project Manager. The Project Manager is responsible for liaising directly with the relevant authorities with respect to the preparation and implementation of the EMPR and complying with the environmental authorisation conditions.

3.3. ENVIRONMENTAL CONTROL OFFICER

The ECO is an independent person responsible for monitoring the implementation of the EMPR. The ECO will be required to monitor the implementation of the EMPR and the conditions of Environmental Authorisation (EA) once the construction phase begins. The project may be subjected to compliance monitoring by the competent authority as and when required.

The ECO will be responsible for:

- Monitoring compliance with conditions of the EA and the EMPR, at a frequency determined by the competent authority;
- Ensuring that all required notifications to government are submitted in a timely manner and are to the satisfaction of competent authority;
- Compile environmental monitoring reports and submit to competent authority;
- Issue Non-Compliance Report (NCR) to the applicant in case of non-compliance; and
- Assist the contractor in dealing with environmental incidents which may occur.

3.4.CONTRACTORS

The Contractor will be responsible for the construction of the proposed Battery storage facility and will be appointed by LTM Green Energies. The Contractor will be responsible for the overall implementation of the EMPR as outlined during the construction phase. The Contractor is answerable to the Project Manager for all environmental issues associated with the project. Contractor performance will, amongst others, be assessed on health, safety and environmental management criteria.

3.5.SAFETY AND HEALTH OFFICER (SHE)

- Responsible for ensuring that safety protocols are being followed on behalf on the contactor
- Take role as also the contractor' Environmental Officer (EO),
- Provide support to the ECO in monitoring the execution of the operation EMPr by being on site at all times during work
- Undertake routine site inspections and provide information to the ECO as required.

- Maintain an incident register and report regularly. Reviewing and approving the site Health and Safety Plan (HASP); Ensuring that the contractor complies with the requirements of the Occupational Health and Safety Act during construction; and ensuring that the contractor complies with the requirements of the Engine
- Be conversant with the conditions of the Environmental Authorization;
- Be conversant with the Environmental Management Plan;

4. RECORD KEEPING

The ECO is responsible for maintaining an environmental file and all records in relation to the EA and EMPR on-site. An electronic/ paper filing document handling system must be established to ensure accurate updating of relevant documents. The system devised must be agreed upon by all key parties. A list of documents likely to be generated during all phases of the project shall be provided by the Project Manager when required. Once the ECO has conducted the site closure inspection and notified the Contractor, all documents described below should be handed over to the Project Manager.

The required documentation would typically include the following:

4.1.PLANNING AND DESIGN PHASE

- Environmental Management Programme
- Environmental Authorisation and any other relevant licences/permit's where applicable
- Final design documents and diagrams issued by the Contractor
- All communications detailing changes of design/scope that may have environmental implications
- Drawings of instructions
- Work method statements

4.2.CONSTRUCTION AND OPERATIONAL PHASE

- Health and Safety File
- Training and/ or induction material
- Training and/ or induction attendance registers
- Site monitoring reports
- Complaints register
- Environmental incidents reports

- Emergency preparedness and response plans
- Permits and legal documents, including letters authorising specific personnel of their duties as part of emergency preparedness teams e.g., fire teams, etc.
- Disciplinary procedures
- Site meeting minutes
- Contractor Method Statements
- Personal Protective Equipment (PPE) register for workers
- Dust suppression register;
- Written Corrective Action Instructions; and
- Notification of Emergencies and Incidents.
- All specialist report made in support of the project

5. MONITORING AND AUDITING PROGRAMME

The Construction activities will be monitored and recorded by the ECO on a daily basis. The purpose of the monitoring programme is to ensure that mitigation measures outlined within this EMPR are implemented. The environmental inspection checklist will be submitted weekly to the appointed ECO.

The Contractor is deemed **NOT** to have complied with this specification if:

- Within the boundaries of the site and there is evidence of contravention of the EMPR and/ or conditions and the EA;
- Environmental or social damage arises due to negligence;
- The Contractor fails to comply with required corrective actions or other instructions issued by delegated authority;
- The Contractor fails to address reported complaints by the public as suctioned by delegated authority; and
- Legal action is instituted against LTM Green Energies in terms of environmental laws.

LTM Green Energies has the ultimate responsibility to comply with the conditions set out in the EA and the mitigation measures proposed in this EMPR.

6. COMPLIANCE WITH THE EMPR

A copy of the EMPr must always be kept on site during the establishment (including the construction) and operational phase of the project. The EMPr will be binding on all personnel operating on the site and must be included within the Contractual Clauses. It should be noted

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

7. NON-COMPLIANCE

During the proposed project, regular monitoring will take place and audit reports should be presented to the Developer, Contractor and Competent Authority (if required) on a regular basis. The outcomes of these reports should be discussed in order to identify solutions to any identified issues.

Any non-compliance with the EMPr will be treated as serious offence. The liability for non-compliance with the EMPr rests with the Contractor.

Application of a penalty clause will apply for incidents of non-compliance. The contractor will be allowed one offense and a written warning will be issued by the ECO. Failure to rectify the offense within one (1) working week of the issue of the warning or a repeat offence will result in a fine. This fine will be issued by the ECO. The penalty imposed will be per incident. Unless stated otherwise in the project specification, the penalties imposed per incident or violation will be:

Offence	Amount
Failure to demarcate working areas.	R 2 000
Working outside of the demarcated areas.	R 5 000
Hazardous chemical/oil spill and/or dumping in non-approved sites.	R10 000
Failure to stockpile topsoil correctly.	R 10 000
Failure to stockpile materials in designated areas.	R 5 000
Failure to take measures to control dust dispersion on site.	R 5 000
Washing of vehicles on site.	R 2 000
Contamination or pollution of water bodies and/or groundwater.	R 10 000
Failure to erect temporary fences around trenches.	R 2 000
Uncontrolled exposure of soil leading to soil erosion.	R 5 000
Any other contravention of the project specific specification.	R 10 000

Such fines will be paid by the Contractor / Engineer to the Project Manager and will be used in rehabilitation and/ or landscaping.

8. EMERGENCY RESPONSE

8.1. Emergency Preparedness

The proposed project will be located on portion 566 of Moedesgift farm, Excelsior, Free State, in a site that does not have an existing emergency plan. The Contractor must compile an emergency plan prior to the commencement of any activity on site. The environmental related emergencies and remediation procedure must include:

- A description of the potential accidents and emergencies;
- Identification of a person who will be accountable during the emergency;
- Responsibility, authority and duties of workers with specific roles during the emergency (fire-wardens, first aid staff, spillage specialists);
- Evaluation of the procedures;
- Identification and location of hazardous materials, and emergency actions required (a Material Safety Data Sheet will be present on-site);
- Interface requirements with external emergency services;
- Communication with statutory bodies;
- Communication with adjacent landowners, adjacent land-users and the public in general; and
- Location of necessary information during the emergency (layout drawings, hazardous material storage areas, procedures, emergency contact details, etc.).

All accidents and incidents must be reported immediately to the ECO. Any person who becomes aware of any environmental damage or pollution must report to his/her supervisor as soon as possible to ensure that necessary corrective actions are taken

The site personnel shall comply with the emergency preparedness and incident and accident-reporting requirements, as required by the Occupational Health and Safety Act, 1993 (Act No 85 of 1993), the NEMA, 1998 (Act No 107 of 1998), the National Water Act, 1998 (Act No 36 of 1998) and the National Veld and Forest Fire Act, 1998 (Act No 101 of 1998) as amended and/or any other relevant legislation.

8.2. Incident Reporting and Remedy

If a leakage or spillage of hazardous substances occurs on site, the area must be contained immediately. The source of the leak must be identified as soon as the leakage is noticed. The

contaminated soil must be removed and be remediated. All the chemicals and equipment must be contained within the development footprint and access by animal to contaminated areas should be fully restricted. Where the spills or leakages effect would expand beyond the site footprint local emergency services 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 must be kept on the corrective and remedial measures decided upon and the progress achieved therewith over time. 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.

9. ENVIRONMENTAL AWARENESS

All workers should receive basic training in environmental awareness which includes the management and handling of hazardous substances/equipment, minimisation of disturbance to sensitive areas, management of waste as well as prevention of water and ground pollution. Workers should be informed of how to recognize historical/archaeological artefacts that may be uncovered and must also be informed of the EMPR's requirements. Proof of all training provided and a register of all attendees must be kept on-site.

The training programme must focus on the following aspects:

- Explaining clearly what the environment is and what the environment consists of namely: air, water, soil, fauna, flora and people.
- Once participants have grasped the description of what the environment entails, the training needs to focus on the potential impacts that the construction and operational activities may have on each one of these environmental components.
- Furthermore, the training must thoroughly explain the mitigation /control measures to be implemented if or when the potential impacts occur.
- This general awareness training must be done before development commences and also when new employees join.

10. ENVIRONMENTAL IMPACTS AND ENVIRONMENTAL MANAGEMENT MEASURES

This section of the EMPR outlines potential environmental impacts and the mitigation measures that must be implemented throughout the planning and design, construction and operational phases of the proposed project.

10.1. DESIGN AND PLANNING PHASE

POTENTIAL RISK	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
Environmental Objective: To ensure that the layout and design are aligned with environmental features and adherence to environmental policies and legislations				
Non-compliance with legal requirements of national and provincial legislation.	<ul style="list-style-type: none"> Identify and acquire all necessary permits from competent authorities before commencement of work. Plans and designs should be signed off by suitably qualified engineers. All changes in the proposed project scope must be well communicated with the EAP to reduce the risk of non-compliance with the necessary legal requirements 	Environmental Authorisation is in place prior to construction. The plans are signed off by a registered engineer.	Once-off prior to construction.	Applicant/Project Manager.
Environmental Objective: Plans and layout of the development to ensure protection of environmental features				
Risk of incorrect design and site layout.	<ul style="list-style-type: none"> Ensure efficient communication during project planning and inception meetings between all stakeholders involved in the proposed development. The development footprint area must be clearly demarcated. The works programme/ plan must have the following (as seen relevant by Project Manager): -Buildings and structures; 	Approved designs and site layout	Once-off prior to construction.	Applicant/Project Manager, Contractor

POTENTIAL RISK	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<ul style="list-style-type: none"> -Site offices; -Delivery access routes without inconveniencing normal traffic flow; -Essential services (permanent and temporary water, electricity); -Solid waste storage and disposal sites; -Toilets and ablution facilities; -Topsoil stockpiles if necessary; and -Any other activities, facilities and structures deemed relevant. 			
Environmental Objective: Adequate planning and design of the proposed development to prevent/manage environmental disturbances.				
Harm to the environment due to inadequate planning and design of the proposed development.	<ul style="list-style-type: none"> • Suitable specialist(s) have been appointed to identify sensitive environmental features (e.g., Biodiversity and wetland specialists) • Mitigation measures provided by the specialist must be implemented. <ul style="list-style-type: none"> • Workers should have adequate ablution facilities to discourage construction workers from using the site as an alternative facility. • Communicate roles and responsibilities for the implementation of the EMPR. • Develop and implement an environmental awareness plan. 	<p>Approved designs and site layout plan.</p> <p>The appointment of an ECO.</p> <p>Approved environmental file with all required documents.</p> <p>The demarcation of sensitive areas.</p>	Throughout the site preparation.	Applicant/Project Manager Contractor

POTENTIAL RISK	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<ul style="list-style-type: none"> • Appointment/ Allocation of an ECO for the construction phase. • Signs should be erected, restricting access, notifying of all potential hazards, and providing contact numbers for site agent and ECO. 			
Environmental Objective: Avoiding conflicts with employees and community members within and around the project area.				
Poor communication and lack of transparency of project information that may lead to conflict and crowding of job-seekers around the site, creating security risk.	<ul style="list-style-type: none"> • Identified I&APs must be informed of the proposed project and include in the life cycle of the proposed project. • Employ locals for low skilled labour and implement skills development where possible. • A Community Liaising Officer (CLO) may be appointed to assist the applicant when employment opportunities arise. • Comments received from the public must be addressed as per the PPP process outlined in the NEMA, EIA regulations. • All environmental related complaints and concerns from the public must be addressed promptly. • Details of ECO should be communicated to I&APs. • Hiring of construction workers should take place within the project site prior to the commencement of the project. 	Records of notification, complaints and concerns from the public to be kept on-site.	Monthly	Applicant/Project Manager Contractor

POTENTIAL RISK	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<ul style="list-style-type: none"> • Access to the project site should be controlled at all times. • The project site must be barricaded in order to have controlled access to the site. 			
Environmental objective: Ensure that construction is undertaken in a legal and an environmentally friendly manner.				
Method statements policy and legal impacts	<p>The Contractor shall submit written Method Statements for the activities identified by the ECO. Activities that will require method statements include:</p> <ul style="list-style-type: none"> • Emergency procedures • Materials, equipment and staffing requirements; • Transporting the materials and/or equipment to, from and within the site; • The storage provisions for the materials and/or equipment; • The proposed construction procedure designed to implement the relevant Environmental Specifications; • Other information deemed necessary by the ECO. <p>• Method Statements shall be submitted prior to the proposed commencement of work on an activity to allow the ECO time to study and approve the method statement.</p>	Provide all relevant method statements to the ECO	Once-off	Project Manager Contractor

10.2. CONSTRUCTION PHASE

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
Environmental Objective: The proposed project has met all regulatory requirements				
Non-compliance with regulatory requirements.	<ul style="list-style-type: none"> • Ensure that all environmental legal requirements are considered and adhered to. • All mitigation measures outlined in the EMPR must be implemented. • Environmental monitoring inspections must be done by the ECO. • Environmental compliance audits must be conducted by the ECO. • Confirm that there are no changes to the original scope of works as authorised in the environmental authorisation (EA). • Records of compliance / non-compliance must be kept on-site at all times and must be made available to the CA upon request. 	<p>Monthly environmental audit reports are kept on-site.</p> <p>ECO's inspection reports are kept on-site.</p> <p>Incidents register is kept on-site.</p> <p>Induction registers available on-site.</p>	Monthly	ECO Project Manager

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<ul style="list-style-type: none"> • Environmental inductions should be provided to all workers by a competent environmental professional. • Records of all environmental incidents must be maintained, and a copy of these records must be made available to the CA on request throughout the proposed project execution. 			
Environmental Objective: Limit the development footprint to minimise impact on the environment				
Risk of construction activities occurring outside the development area.	<ul style="list-style-type: none"> • The boundaries of footprint areas, including contractor laydown areas are to be clearly defined and demarcated. • Construction activities are confined within approved footprint. • Extension of the footprint can only be done if there is an approved amendment from the competent authority. • All activities must be done within the defined footprint areas. • A copy of the approved site layout plan must be kept on-site. 	<p>The project is developed within the approved footprint.</p> <p>Copy of approved layout plan is kept on-site.</p> <p>No stockpiles or materials are kept in sensitive areas.</p>	Monthly	Contractor, ECO

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
Health and safety: To ensure that the site is safe from fire incidents that may occur				
Risk of damage caused by fires on-site.	<ul style="list-style-type: none"> No open fires are allowed in or near the construction area. A site-specific Emergency Response Plan must be developed for the site prior to construction and must be implemented. Firefighting equipment (e.g., fire extinguishers) must be located at key locations and all personnel must be trained to use the equipment Smoking must only be allowed in designated areas and away from flammable substances. Occupational Health and Safety file should be developed and approved by a Safety Agent before construction works start. Materials Safety Data Sheets (MSDS) should be displayed on-site for all hazardous substances kept on-site. No open fires should be allowed except for fires related to the construction works. 	<p>Emergency Response Plan must be in place.</p> <p>Fire drill register kept in the site file.</p> <p>Smoking areas demarcated.</p> <p>There is adequate signage on-site.</p> <p>MSDS displayed on-site.</p>	Monthly	Contractor ECO, HSO

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<ul style="list-style-type: none"> Contact numbers for Fire Department in the area should be displayed on-site. Fire drills should be done monthly and records thereof kept on-site. 			
Health and safety: Ensure safety of all employees on-site and prevent negative health and safety incidents which may arise				
Health and safety risk that may arise and impact on the public and construction workers.	<ul style="list-style-type: none"> The contractor must comply with the standards set out in the Occupational Health and Safety Act. Ensure that all signage of safety risks that may be present are clearly marked and cordoned off from the public. All construction workers must be provided with Personal Protective Equipment (PPE). All workers should have medical fitness certificates. All workers must be thoroughly trained on Health and Safety topics. All construction activities must comply with the Occupational Health and Safety Act. 	<p>Records of training undertaken are kept in the file.</p> <p>PPE register kept on- site.</p> <p>Workers must wear appropriate PPE.</p> <p>Proper signage erected.</p> <p>Health and safety audit reports kept on-site.</p>	Monthly	Contractor, ECO, HSO

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<ul style="list-style-type: none"> • First Aider should be on-site at all times during working hours. • Ambulance numbers should be displayed on the site board. • Health and Safety audits should be conducted monthly. 			
Environmental Objective: Minimisation of cumulative ambient noise produced within the project site.				
Ambient noise levels are likely to increase because of the construction activities	<ul style="list-style-type: none"> • Noise generating activities must be conducted during daytime hours. • Vehicles and equipment must be inspected and maintained on a regular basis; inspection books should be available on request. • No sound amplification equipment such as sirens, loud halers or hooters are to be used on site except in emergencies. • A complaints register should be kept on site. The register must record the following: Date when complaint was received, name of person who reported the complaint, details of 	<p>A complaints register must be kept on-site</p> <p>Vehicle and equipment inspection books available.</p>	<p>Daily inspections</p> <p>Monthly audits</p>	Contractor, ECO

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<p>the complaint and when and how the concern was addressed.</p> <ul style="list-style-type: none"> Workers are required to remain within construction site during working hours. Workers are required to behave in a responsible matter. Construction vehicles and machinery should keep a speed limit of 20km/hr within the project site and 60km/hr along external access roads. 			
Environmental Objective: Minimise cumulative dust generation and exhaust emissions within the project site.				
Dilapidation of ambient air quality due to dust and exhaust emissions generation.	<ul style="list-style-type: none"> Dust-suppressing methods must be utilised on access roads where excessive dust cannot be avoided. Construction vehicles and machinery should keep a speed limit of 20km/hr within the 	<p>Minimal observation of dust and exhaust emissions</p> <p>No complaints from workers and adjacent landowners.</p>	As necessary	Applicant/Project Manager, Contractor, ECO

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<p>project site and 60km/hr along external access roads.</p> <ul style="list-style-type: none"> • A complaints register should be kept on-site. The register must record the following: Date when complaint was received, name of person who reported the complaint, details of the complaint and when and how the concern was addressed. • Regular maintenance of vehicles and equipment should be undertaken. Optimal engine combustion will allow for “cleaner” exhaust emissions. • Suppression of dust by water spraying is encouraged. • Avoid transporting wind-erodible material during strong-wind days (should this not be practicable the erodible material shall be covered). 			
Environmental Objective: Prevention of soil contamination due to hazardous substances				

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
Soil pollution due to hazardous chemical substances including fuel greases and oils used on site.	<ul style="list-style-type: none"> Identify all hazardous chemical substances used on-site, including fuel, grease and oil. Obtain Material Safety Data Sheet (MSDS) for each of the hazardous chemical substances, which all personnel handling the substances must be trained in. Appropriate equipment to deal with an emergency spill incident must be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated soil. Immediately clean all spillages of fuels, lubricants and other petroleum-based products. Soil and other material contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site 	<p>MSDS for all hazardous substances available on-site.</p> <p>Spill kits available on-site</p> <p>Incidents recorded and reported, indicating the kind of incident, when it occurred and how it was mitigated.</p>	Monthly	Contractor, ECO, HSE

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
Environmental Objective: Prevention of soil erosion and siltation				
Exposure to soil erosion and siltation	<ul style="list-style-type: none"> • No sedimentation or ponding of water should be allowed on-site. • Contractors are to ensure that all reasonable measures are taken through utilisation of berms and other soil erosion prevention measures. • Do not allow erosion to develop to a large scale before taking action. • Make sure no soil is washed away and deposited inside stormwater channels. • Existing roads and tracks should be used as far as possible. • Retain soil in position as long as possible. It should only be removed immediately before construction takes place. • Stockpiles can be covered with shade netting to minimise wind and water erosion 	<p>Vehicles should only travel on the designated roads</p> <p>The stormwater management plan must be designed and implemented.</p>	Throughout the construction phase	Applicant/Project Manager, Contractor, and ECO

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<ul style="list-style-type: none"> • Orange mesh or other suitable materials to be used to demarcate open excavations with approval from the Engineer. (No use of danger tape allowed) • Stormwater management plan needs to be submitted to the ECO, approved and implemented to mitigate storm water channels where flow is concentrated. • Temporary stormwater management measures in high erosion areas should be compiled by the contractor and approved in consultation with the ECO. • No servicing of vehicles allowed on site. • Topsoil material removed should be a minimum depth of 150mm to a maximum depth of 250mm. • Organic matter shall not be removed from stripped soil • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion 			

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<p>resultant from activities within and adjacent to the construction camp and Work Areas.</p> <ul style="list-style-type: none"> • Utilise only light equipment for access and deliveries into areas of unstable soils, in areas where erosion is evident, and at stream and river embankments • Limit vehicular access into rocky outcrops and ridges • Do not allow surface water or storm water to be concentrated, or to flow down cut or fill slopes or along pipeline routes without erosion protection measures being in place. • No water may be abstracted from any surface water body for the purpose of construction unless permitted by Department of Water and Sanitation 			

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
Environmental Objective: Achieve efficient waste management to keep the construction site clean and healthy.				
Poor waste management on site can contaminate water and soil, as well as pose health threats to workers.	<ul style="list-style-type: none"> No material must be left on-site that could be of harm to people and animals. Waste must not be dumped indiscriminately on-site. Concrete trucks, if any, must not be washed on-site unless adequate washing and concrete collection facilities are available and such washing is controlled. Bins must be made available by the contractor for the storage of construction waste and rubble. Bins must be labelled for different types of waste produced. 	<p>No litter on-site.</p> <p>No overflowing of waste bins.</p> <p>Site is kept clean.</p>	Daily by ECO	Contractor, ECO

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<ul style="list-style-type: none"> The Contractor must remove and dispose of all spoil and waste at a registered landfill site. Proof of such disposal shall be kept in the environmental file on-site. No burning of waste shall be permitted on-site. The Contractor must conduct regular inspection to ensure that no littering occurs on and around their site. All hazardous waste must be stored in sealed and suitably labelled containers for removal to a registered hazardous waste disposal facility. Hazardous waste shall be stored on-site for a period of no longer than 90 days, where after it shall be disposed of at a registered hazardous waste disposal site. 			
Environmental Objective: Protection of flora and prevention of spread of alien and invasive species				
Spread of alien invasive plant species from the transformed	<ul style="list-style-type: none"> Alien invasive species should be removed (prioritizing NEMBA category 1A & B species). 	No alien and invasive species on-site.	Monthly	Applicant Project Manager ECO

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
areas to the natural vegetation	<ul style="list-style-type: none"> All alien seedlings and saplings must be removed as they become evident. Hazardous chemicals may impact upon natural vegetation in the area as well as the freshwater resources. Develop alien species eradication plan 			
Environmental Objective: Protection of fauna				
Disturbance of faunal species by human activities	<ul style="list-style-type: none"> Education of site workers and contractors about the value of fauna and environmental sensitivity. Site workers and contractors should ensure that no animals are disturbed, trapped, hunted or killed. Excavations must be barricaded and inspected daily for animals that might fall in. The site should be cleared of litter that could potentially be swallowed by animals. Contact details for animal rescue services should be available on-site in case it is required. 	<p>Environmental awareness training must be conducted and records kept on-site monthly.</p> <p>No killing of animals allowed on-site.</p>	Duration of construction phase	Contractor ECO

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
Environmental Objective: Prevent contamination of groundwater resource				
Groundwater pollution due to unsanitary conditions on-site.	<ul style="list-style-type: none"> • Sufficient and adequate ablution facilities shall be provided. • Ablating anywhere other than in toilets shall not be allowed. • Awareness of the importance of proper hygiene should be created among employees. 	<p>Adequate toilets provided.</p> <p>Workers use ablution facilities provided.</p> <p>No evidence of pollution.</p>	Daily	ECO
Groundwater contamination due to poor management and accidental spills of hazardous chemical substances including fuel, greases and oils used on site	<ul style="list-style-type: none"> • Identify all hazardous substances used on site including fuel, greases and oils. • Obtain MSDS for each hazardous chemical substance and display it on-site. • Ensure that the MSDS have sufficient information to enable the user to take the necessary measures to protect his/her health and safety and that of the environment. • MSDS for all hazardous substances must be readily available on-site. 	<p>Adequate toilets provided.</p> <p>Worker's ablution facilities provided.</p> <p>No evidence of pollution.</p>	Daily	ECO

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<ul style="list-style-type: none"> • All construction vehicles must be accurately maintained on a regular basis to avoid oil and fuel leaks. • Appropriate equipment to deal with emergency spill incidents must be readily available. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. • Soil contaminated with hazardous substances shall be treated as hazardous waste and removed from site for safe disposal (records of such shall be maintained). • Spillages may not be covered with soil. • All liquid fuels are to be stored in tanks and containers with lids on an impermeable surface in a bunded area. • Generators must be stored on concrete floors in bunded areas. 			

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
Environmental Objective: Heritage and palaeontology- Preservation of important historical and /or archaeological sites, features or artefacts.				
Construction activities may disturb or destroy sites, features or artefacts of archaeological and/or historical importance.	<ul style="list-style-type: none"> • Employees must be trained on procedures to follow when historical and /or archaeological features, artefacts are found on site during the construction phase. • If during any construction activities, any sites, features or objects of cultural heritage (archaeological or historical) nature are exposed, a qualified specialist should be contacted to investigate, and suitable mitigation measures must be implemented. All activities in the area should be stopped until the situation has been resolved • The Gauteng Heritage Resource Agency must be informed immediately of the discovery of any archaeological and/or historical items of importance • If bedrock is exposed during excavations, a qualified specialist must be appointed to inspect excavations for the presence of 	<p>Continuous inspections during excavation activities</p> <p>Informing the provincial Heritage Resource Authority of Gauteng if any artefacts are found</p>	Monthly	ECO

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<p>fossils. If excavations will not expose bedrock, no further mitigation for palaeontological heritage is recommended</p> <ul style="list-style-type: none"> • No person may destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite • No person may trade in, sell for private gain, export or attempt to export from the Republic any category of archaeological or paleontological material or object, or any meteorite. 			
Environmental Objective: Efficient traffic management to prevent excessive traffic and accidents				
Traffic increase around the project site due to construction activities	<ul style="list-style-type: none"> • Vehicles transporting material to the site should keep to speed limit of 20km/hr within the project site and 60km/hr along access roads. • Transportation of materials to the site should be done during low-volume traffic times. 	<p>Traffic management according to the project site procedures.</p> <p>No accidents reported.</p>	Monthly	ECO

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<ul style="list-style-type: none"> • Only suitably licensed operators and drivers should drive and operate machinery and construction vehicles. • Ensure effective communication with all interested and affected parties, detailing the period of construction as well as possible access routes if they are available to avoid congestion. • Vehicles should be labelled as per safety specification. 			
Socio-Economic Objective: To grow the local economy and provide jobs and skills to local residents				
The employment and training of low skilled individuals within the area. Procurement of goods and services required by the project may enhance the local economy	<ul style="list-style-type: none"> • As far as possible employ locals for low skilled labour and implement skills development. • The ECO must ensure that all Contractors and workers undergo Environmental Induction prior to commencing with work on-site. • The Environmental Induction must be conducted in language(s) that the workers 	<p>Environmental training records to be kept onsite.</p> <p>Proof of local labours.</p> <p>Complaints register must be available onsite.</p>	Monthly	Applicant/Project Manger Site Agent ECO

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
both directly and indirectly	<p>understand. Where necessary, the ECO must translate induction material to meet language proficiency of all workers.</p> <ul style="list-style-type: none"> As far as possible ensure that construction material is procured locally to support local businesses and enhance the local economy. All I&APs must be identified and informed of the proposed project and included in the life cycle of the proposed project. All complaints received from the public must be recorded in a register, kept on-site, and addressed accordingly. 			
Landscape Character - Reduce or alleviate the intrusive contrast between the proposed project components, activities, and the receiving landscape to acceptable visual landscape receptors				
<p>Altering the landscape character.</p> <ul style="list-style-type: none"> Potential visual impacts on Residents. 	<p>General</p> <ul style="list-style-type: none"> Where areas are going to be disturbed through the destruction of vegetation, for example, the establishment of the construction camp, the vegetation occurring in the area to be disturbed must be replanted 	Reduce the intrusive contrast between the proposed project components, activities, and the receiving landscape.	Throughout the project's lifecycle	Applicant ECO

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
<ul style="list-style-type: none"> Potential visual impacts on tourists. <p>Potential visual impacts on motorists.</p>	<p>with endemic, indigenous species. A hydroseeding application is recommended in the disturbed areas as a measure of rehabilitation.</p> <p>Infrastructure Buildings</p> <ul style="list-style-type: none"> Rehabilitate disturbed areas around buildings as soon as practically possible after construction. This should be done to restrict extended periods of exposed soil. Plant fast-growing endemic trees along the building yard, service road and infrastructure. The trees will with time create a screen and increase the biodiversity of the area. It is also recommended that trees be planted along the perimeter of the site, to reduce the visual impact of viewers <p>Access Routes</p>			

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<ul style="list-style-type: none"> • Make use of existing access roads where possible. • Where new access roads are required, the disturbance area should be kept to a minimum. A two-track dirt road will be the most preferred option. • Locate access routes so as to limit modification to the topography and to avoid the removal of established vegetation. • Road verges that need to be cleared should be kept to a minimum. • Access routes should be located on the perimeter of disturbed areas such as cultivated/fallow lands so as not to fragment intact vegetated areas. • If it is necessary to clear vegetation for a road, avoid doing so in a continuous straight line. Alternatively, curve the road in order to reduce the visible extent of the cleared corridor. 			

IMPACT	MANAGEMENT /MITIGATION ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<p>Construction camps and lay down yards</p> <ul style="list-style-type: none"> • If practically possible, locate construction camps in areas that are already disturbed or where it isn't necessary to remove established vegetation like for example naturally bare areas. • Utilise existing screening features such as dense vegetation stands or topographical features to place the construction camps and lay-down yards out of the view of sensitive visual receptors. • Keep the construction sites and camps neat, clean and organised in order to portray a tidy appearance. • Screen the construction camp and lay-down yards by enclosing the entire area with a dark green or black shade cloth of no less than 2m height. 			

The project management measures for the terrestrial biodiversity during the construction phase

Environmental Theme: Vegetation and Habitats (Fauna)

Impact Management Outcome: Protection of the vegetation and habitat to ensure adequate ecological functioning

Phase: Construction

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
To mitigate fire risk, a 3-meter buffer must be cleared around the entire project footprint. This buffer zone will be regularly maintained, ensuring it remains free of combustible materials. Regular fire risk assessments and monitoring will be conducted, and fire suppression equipment will be readily accessible on site to respond promptly to any fire incidents.	Contractor/ Environmental Control Officer	Design engineer to consider this for final layout	Pre-construction Phase	Environmental Control Officer	Throughout phase	Fire suppression units is available.
Areas to be developed/disturbed be specifically demarcated so that during the construction/activity phase, only the authorized areas be impacted upon. Areas of indigenous vegetation	Contractor/ Environmental Control Officer	Design engineer to consider this for final layout	Construction Phase	Environmental Control Officer	Throughout phase	Avoided features

outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. The construction area must be fenced off and no ingress into other areas allowed.						
Areas that have been disturbed during construction, but will not undergo development, must be revegetated with indigenous vegetation dominant in the area.	Contractor/ Environmental Control Officer	Implement a rehabilitation plan	Construction Phase	Environment al Control Officer	Throughout phase	Rehabilitation implemented
Make use of existing access routes before new routes are considered. Any selected "new" route must be authorized, minimizing disturbances to undisturbed areas.	Contractor	Design engineer to consider this for final layout	Construction Phase	Environment al Control Officer	Throughout phase	All routes authorised
Minimize unnecessary clearing of vegetation beyond the development footprints	Contractor/ Environmental Control Officer	Visibly demarcate authorised working areas	Construction Phase	Environment al Control Officer	Throughout phase	Clearance is minimised
Make sure all excess consumables are removed from site and deposited at an appropriate waste facility	Contractor/ Environmental Control Officer	Restrict to designated working/storage/s ervice areas	Construction Phase	Environment al Control Officer	Throughout phase	Restricted to demarcated area

Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) or construction materials on site (e.g. concrete) in such a way as to prevent them leaking	Contractor/ Environmental Control Officer	Restrict to designated working/storage/ service areas	Construction Phase	Environment al Control Officer	Throughout phase	Restricted to demarcated area
Provide appropriate sanitation facilities for workers during construction and service them regularly	Contractor	Provide service ablution for contractors/labour	Construction Phase	Environment al Control Officer	Throughout phase	Ablution facilities provided and serviced
The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected must be disposed of at a licensed disposal facility	Contractor	Implement waste management plan	Construction Phase	Environment al Control Officer	Throughout phase	Plan is implemented
The Contractor must be in possession of an emergency spill kit that must always be complete and available on site	Contractor	Implement spill response plan	Construction Phase	Environment al Control Officer	Throughout phase	Spill kits are available

Impact Management Outcome: Avoiding Alien Invasive plant infestation						
Phase: Construction						
Impact Management Actions	Implementation			Monitoring		

	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas thereby causing further encroachment of invasive species.	Contractor/ Environmental Control Officer	Design engineer to consider this for final layout	Construction Phase	Environmental Control Officer	Throughout phase	Avoided features
An Invasive Alien Plant Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual changed in IAP composition	Contractor/ Environmental Control Officer	Design engineer to consider this for final layout	Construction Phase	Environmental Control Officer	Throughout phase	Avoided features
Areas that have been disturbed during construction, but will not undergo development, must be revegetated with indigenous vegetation dominant in the area.	Contractor/ Environmental Control Officer	Implement a rehabilitation plan	Construction Phase	Environmental Control Officer	Throughout phase	Rehabilitation implemented

Cumulative Impacts associated with the proposed project

Impact	Project in Isolation			Project and Surrounding Projects		
	Sensitivity of Receiving Environment	Probability of Impact	Significance	Sensitivity of Receiving Environment	Probability of Impact	Significance
Cumulative habitat loss and ecological processes	2	2		2	3	
	Ecology with limited sensitivity/importance	Possible	Low	Ecology with limited sensitivity/importance	Likely	Low

10.3. OPERATIONAL PHASE

IMPACT	MANAGEMENT /MITIGATION/ ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
Environmental Objective: Minimal noise generation during the operational phase				
Ambient noise levels are likely to increase as a result of maintenance activities that may occur during the operational phase.	<ul style="list-style-type: none"> • Maintenance activities that may generate noise must be conducted during daytime hours. • The battery storage facility equipment must be inspected and maintained on a regular basis. • No sound amplification equipment such as sirens, loud halers or hooters to be used on site except in emergencies. • A complaints register should be kept on site. • The register must record the following: Date when complaint was received, name of person who reported the complaint, details of the complaint and when and how the concern was addressed. 	Record of incidents and complaints kept by Applicant.	Annually or as per EA conditions	Applicant ECO
Geology and Soil- Prevention of soil contamination				

IMPACT	MANAGEMENT /MITIGATION/ ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
Soil contamination due to hazardous chemical substances including fuel greases and oils used on site during the maintenance or spill event associated with the proposed project.	<ul style="list-style-type: none"> Identify all hazardous chemical substances used on site, including fuel, greases and oils. Obtain the MSDS for each of the hazardous substances and display them on-site. Appropriate equipment and trained personnel to deal with emergency spill incidents is to be readily available on site. The equipment includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. Immediately clean all spillages of fuels, lubricants and other petroleum-based products. Soil and other material contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site. Dolomite study must be undertaken must be referred to during the construction. Soil stockpiles should not be higher than 1.5 metres. 	A register for spillages should be kept on site.	Annually or as per EA conditions	Applicant ECO

IMPACT	MANAGEMENT /MITIGATION/ ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<ul style="list-style-type: none"> Avoid transporting wind-erodible material during strong-wind days. Vegetation clearing to be done when works in that area are about to commence to prevent dust. 			
Risk of soil erosion during maintenance activities that may be required for the proposed project	<ul style="list-style-type: none"> Don't allow erosion to develop to a large scale before taking action. Soil erosion measures must be implemented on areas that have been excavated and are sloped. During maintenance, existing roads and tracks should be used as far as possible. 	Regular erosion monitoring to be done.	Annually or as per EA conditions	Applicant ECO
Health and Safety: Avoid any work-related injuries within the battery storage facility				
Injuries, electrocutions and/ or sicknesses caused to workers during the operation of the battery storage facility.	<ul style="list-style-type: none"> All employees in the plant must be fully trained for the operations of the facility Health and safety rules set out by the power station must be adhered to at all times Adhere to the Occupational Health and Safety Act. Operators are trained and competent to operate the plant. 	All incidents are to be reported and attended to. Record of incidents and incidents reports kept on-site.	Duration of the operational phase and/or as necessary	Applicant/project manager, HSO

IMPACT	MANAGEMENT /MITIGATION/ ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<ul style="list-style-type: none"> • Training records should be kept on file and be made available during audits. • Compile method statements for approval by the Technical/SHEQ Manager for the operation and management for the duration of the project life cycle. Method statements should be kept on site at all times • Provide signage on site specifying the types of electricity in use and the risk of exposure to hazardous material and electric shock. Signage should also specify how electrical and chemical fires should be dealt with by first responders, and the potential risks to first responders (e.g. the inhalation of toxic fumes, etc.). • Firefighting equipment should readily be available at the operations area and within the site. • Maintain strict access control to the operations area. • Ensure all maintenance contractors / staff are familiar with the supplier's specifications. • Undertake daily risk assessment prior to the commencement of daily tasks at the plant. This should consider any aspects which could result in fire or 			

IMPACT	MANAGEMENT /MITIGATION/ ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	spillage, and appropriate actions must be taken to prevent these..			
Fauna and Flora: Prevent the spread of invasive plant species				
Increased spread of alien and invasive plant species during the operational phase of the proposed development	<ul style="list-style-type: none"> • Alien invasive species should be removed. • Implement alien and invasive plant eradication plan with regular follow-up. 	The site is to be kept clean of alien and invasive plants.	Annually or as per EA conditions	Applicant ECO
Groundwater resource: Avoid groundwater contamination.				
Groundwater pollution due to maintenance activities undertaken for the proposed project. That may include: Potential spills of hazardous chemical substances including fuel, greases and oils used on	<ul style="list-style-type: none"> • Identify all hazardous chemical substances used on site including fuel, greases and oils. • Obtain the material safety data sheets for each of the hazardous substances. • MSDS for all hazardous chemical substances must be readily available on site. • Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip 	Spillages will be reported and cleaned up. Incidents reports will be kept on-site.	Annually or as per EA conditions	Applicant ECO

IMPACT	MANAGEMENT /MITIGATION/ ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
site during maintenance activities	<p>trays for equipment and/or machinery leaks, drums or containers for contaminated water.</p> <ul style="list-style-type: none"> • Soil contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site. • During refuelling, the ground must be protected, and proper dispensing equipment is to be used. • All liquid fuels are to be stored in tanks and containers with lids on an impermeable surface in a bunded area. • Monitoring of the facility should be done regularly to ensure stability of infrastructure. • Potential Leakages of pipes must be monitored on a weekly basis. If leakages are observed they must be sealed immediately. • Generators must be stored on concrete floors in bunded areas. 			
Socio Economic- Skills development and the growth of the local economy				

IMPACT	MANAGEMENT /MITIGATION/ ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
Creation of Jobs and transfer of skills Increased economic growth and the sourcing of local equipment and services.	<ul style="list-style-type: none"> As far as possible ensure that goods and services are sourced locally to support local businesses and enhance the local economy Employment should as far as possible be sourced locally. 	Annually	Annually or as per EA conditions	Applicant E
Landscape Character - Reduce or alleviate the intrusive contrast between the proposed project components, activities, and the receiving landscape to acceptable visual landscape receptors				
<p>Altering the landscape character.</p> <ul style="list-style-type: none"> Potential visual impacts on Residents. Potential visual impacts on tourists. Potential visual impacts on motorists. 	<p>Access Routes</p> <ul style="list-style-type: none"> Make use of existing access roads where possible. Where new access roads are required, the disturbance area should be kept to a minimum. A two-track dirt road will be the most preferred option. Locate access routes so as to limit modification to the topography and to avoid the removal of established vegetation. Road verges that need to be cleared should be kept to a minimum. 	Reduce the intrusive contrast between the proposed project components, activities, and the receiving landscape.	Throughout the project's lifecycle	Applicant ECO

IMPACT	MANAGEMENT /MITIGATION/ ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<ul style="list-style-type: none"> • Access routes should be located on the perimeter of disturbed areas such as cultivated/fallow lands so as not to fragment intact vegetated areas. • If it is necessary to clear vegetation for a road, avoid doing so in a continuous straight line. Alternatively, curve the road in order to reduce the visible extent of the cleared corridor. 			

Environmental Theme: Vegetation and Habitats (Fauna)						
Impact Management Outcome: Protection of the vegetation and habitat to ensure adequate ecological functioning						
Phase: Operation						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
Make use of existing access routes as much as possible, before new routes are considered. Any selected	Contractor	Design engineer to consider this for final layout	Construction Phase	Environmental Control Officer	Throughout phase	All routes authorised

“new” route must be authorized, minimizing disturbances to undisturbed areas.						
Minimize unnecessary clearing of vegetation beyond the development footprints	Contractor/ Environmental Control Officer	Visibly demarcate authorised working areas	Construction Phase	Environmental Control Officer	Throughout phase	Clearance is minimised
The use of herbicides is not recommended (opt for mechanical removal).	Contractor/ Environmental Control Officer	Demarcate buffer area	Construction Phase	Environmental Control Officer	Throughout phase	Avoided buffer area
Impact Management Outcome: Avoiding Alien Invasive plant infestation						
Phase: Operation						
Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
An AIP Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual changed in AIP composition	Contractor/ Environmental Control Officer	Design engineer to consider this for final layout	Construction Phase	Environmental Control Officer	Throughout phase	Avoided features

10.4. Decommissioning phase

IMPACT	MANAGEMENT /MITIGATION/ ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
Environmental Objective: Minimise land pollution from poor waste management				
Waste materials can impact negatively on the project site and the surrounding environment.	<ul style="list-style-type: none"> • Containers must be clear of any hazardous materials; those are contaminated with hazardous material must be treated as hazardous waste. • Recycle and re-use components as much as possible. • Removal of equipment off-site. • Refuse bins should be emptied and removed from the site. • Dispose refuse and waste from facilities at a registered landfill site. • Restore the area to a similar of better state than it was before project implementation 	Record of incidents and complaints kept by Applicant.	Duration of decommissioning phase	Applicant, ECO
Geology and Soil- Prevention of soil contamination				

IMPACT	MANAGEMENT /MITIGATION/ ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
Soil contamination due to hazardous chemical substances including fuel greases and oils used on site during the decommissioning or spill event associated with the proposed project.	<ul style="list-style-type: none"> • Identify all hazardous chemical substances used on site, including fuel, greases and oils. • Obtain the MSDS for each of the hazardous substances and display them on-site. • Appropriate equipment and trained personnel to deal with emergency spill incidents is to be readily available on site. The equipment includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment and/or machinery leaks, drums or containers for contaminated water. • Immediately clean all spillages of fuels, lubricants and other petroleum-based products. • Soil and other material contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site. 	A register for spillages should be kept on site.	Duration of decommissioning phase	Applicant ECO

IMPACT	MANAGEMENT /MITIGATION/ ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
Health and Safety: Avoid any work-related injuries within the Battery storage facility				
Injuries and or sicknesses caused to workers during the decommissioning of the Battery storage facility	<ul style="list-style-type: none"> All employees in the plant must be fully trained for the decommissioning of the facility Health and safety rules set out by the power station must be adhered to at all times Adhere to the Occupational Health and Safety Act. 	<p>All incidents are to be reported and attended to.</p> <p>Record of incidents and incidents reports kept on-site.</p>	Duration of decommissioning phase	Applicant, HSO, ECO
Groundwater resource: Avoid groundwater contamination.				
<p>Groundwater pollution due to decommissioning activities undertaken for the proposed project. That may include:</p> <p>Potential spills of hazardous chemical substances including fuel, greases and oils used on site during maintenance activities</p>	<ul style="list-style-type: none"> Identify all hazardous chemical substances used on site including fuel, greases and oils. Obtain the material safety data sheets for each of the hazardous substances. MSDS for all hazardous chemical substances must be readily available on site. Appropriate equipment to deal with emergency spill incidents is to be readily available on site. This includes fire extinguishers, spill kits for hydrocarbon spills, drip trays for equipment 	<p>Spillages will be reported and cleaned up.</p> <p>Incidents reports will be kept on-site.</p>	Duration of decommissioning phase	Applicant ECO

IMPACT	MANAGEMENT /MITIGATION/ ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<p>and/or machinery leaks, drums or containers for contaminated water.</p> <ul style="list-style-type: none"> • Soil contaminated with hazardous chemical substances shall be treated as hazardous waste and removed from site. • During refueling, the ground must be protected, and proper dispensing equipment is to be used. • All liquid fuels are to be stored in tanks and containers with lids on an impermeable surface in a banded area. • Monitoring of the facility should be done regularly to ensure stability of infrastructure. 			
Prevention of erosion and revegetation of surrounding areas	<ul style="list-style-type: none"> • Natural restoration of topography and stormwater channeling are encouraged. • Declared weeds or problem plants should be removed if they occur on-site. 	<p>Complaints register will be kept on site</p> <p>Incidents reports will be kept on-site.</p>	Duration of decommissioning phase	Applicant ECO

IMPACT	MANAGEMENT /MITIGATION/ ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<ul style="list-style-type: none"> • Other methods of rehabilitation may also be used at the discretion of the ECO or the landowner. • The site should be paved or compacted to prevent soil erosion. • Any contaminated material or soil should be removed for disposal at a registered hazardous waste disposal facility and proof of disposal should be provided and kept in the file. The prescribed re-vegetation process should be followed thereafter. • All effluent washing water should be properly disposed of. • Effluents containing oil, grease or other industrial substances should be collected in a suitable receptacle and removed from the site, for resale or disposal at a recognized facility and proof of disposal should be provided. • All rehabilitation is to be done with approval of the landowner. 			

IMPACT	MANAGEMENT /MITIGATION/ ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
	<ul style="list-style-type: none"> • Rehabilitate disturbed areas around buildings as soon as practically possible after construction. This should be done to restrict extended periods of exposed soil. • Plant fast-growing endemic trees along the building yard, service road and infrastructure. The trees will with time create a screen and increase the biodiversity of the area. • It is also recommended that trees be planted along the perimeter of the site, to reduce the visual impact of viewers. 			
Improper disposal of batteries can lead to the release of toxic substances (e.g., heavy metals, lithium, and electrolytes) into the environment, contaminating soil and groundwater.	<ul style="list-style-type: none"> • Ensure all batteries and hazardous materials are disposed of according to local regulations. • Partner with certified recycling facilities that specialize in battery recycling. • Develop a waste management plan that includes the identification, storage, transportation, and disposal of hazardous materials. 	<ul style="list-style-type: none"> • Regular audits of waste handling and disposal processes • Track and document the disposal or recycling of each battery. 	Duration of decommissioning phase	Applicant ECO

IMPACT	MANAGEMENT /MITIGATION/ ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
		<ul style="list-style-type: none"> Track and report the volume of materials recycled, reused, and sent to landfill. Periodic review of waste management practices to improve efficiency. 		
<p>Improper disposal of batteries can lead to the release of toxic substances (e.g., heavy metals, lithium, and electrolytes) into the environment, contaminating soil and groundwater.</p>	<ul style="list-style-type: none"> Ensure all batteries and hazardous materials are disposed of according to local regulations. Partner with certified recycling facilities that specialize in battery recycling. Develop a waste management plan that includes the identification, storage, transportation, and disposal of hazardous materials 	<ul style="list-style-type: none"> Regular audits of waste handling and disposal processes. Track and document the disposal or recycling of each battery. 	<p>Duration of the decommissioning phase</p>	<p>Applicant ECO</p>

IMPACT	MANAGEMENT /MITIGATION/ ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
Potential spills of battery acid, chemicals, or other hazardous materials during disassembly could contaminate local soil and water resources.	<ul style="list-style-type: none"> • Implement spill prevention and response plans. • Use containment measures like bunding and spill kits during decommissioning activities. • Conduct site assessments and clean-up procedures after decommissioning. 	<ul style="list-style-type: none"> • Regular soil and water quality testing before, during, and after decommissioning. • Inspection of containment measures during decommissioning activities. 	Duration of the decommissioning phase	Applicant ECO
Decommissioning activities, especially the handling of batteries and other components, may release pollutants, including volatile organic compounds (VOCs) and dust.	<ul style="list-style-type: none"> • Use dust suppression techniques such as water spraying. • Ensure proper ventilation and use of personal protective equipment (PPE) to minimize exposure to VOCs. 	<ul style="list-style-type: none"> • Air quality monitoring around the site during decommissioning. • Regular health checks for workers involved in the decommissioning process. 	Duration of the decommissioning phase	Applicant

IMPACT	MANAGEMENT /MITIGATION/ ACTIONS	MONITORING		
		CRITERIA	FREQUENCY	RESPONSIBILITY
Decommissioning activities might generate significant noise, affecting local communities and wildlife.	<ul style="list-style-type: none"> • Schedule noisy activities during daytime hours to minimize disturbance. • Use noise barriers or enclosures around particularly loud equipment. 	<ul style="list-style-type: none"> • Regular noise level monitoring at the site boundary. • Community feedback mechanisms to track noise complaints. 	Duration of the decommissioning phase	Applicant ECO

11. MANAGEMENT OBJECTIVES AND MEASURABLE TARGETS

This section describes strategies to manage issues identified relating to physical, social, biological and historical environments. Also outlined are the objectives to be achieved addressing these issues and measuring targets to assist in evaluating the extent to which the objectives are achieved.

Physical issues: Objectives and Measurable targets

Objectives refer to what must be achieved by the end of the construction, while measurable targets are means of verifying if the objectives are achieved.

Physical issues	Management	Objectives	Measurable targets
Access roads	<ul style="list-style-type: none"> • If there is no existing access road to the proposed project site then the contractor and the landowner should collaborate in identifying one. • The contractor and adjacent landowners using the access road must discuss and agree on a maintenance program for the access road. All agreements reached in terms of the maintenance of the access road must be documented and duly signed. • The access road must be constantly maintained. 	<ul style="list-style-type: none"> • Avoid damage to existing access roads • Avoid damage to environment due to construction and rehabilitation of new access roads • Minimize loss of topsoil and enhancement of erosion 	<ul style="list-style-type: none"> • No claims due to damage on existing access roads • No visible erosion on access roads six months after completion of construction • No loss of topsoil due to runoff water on access roads

<p>Rubble and refuse disposal</p>	<ul style="list-style-type: none"> • The contractor shall collect and dispose all non-useful construction materials (such as steel, rods etc) on site in an appropriate manner and at a designated place during, and after construction. • All packaging materials must be removed from the site and disposed of in a legally approved dumping site and there should be no burning of refuse on site. • The dumping site must not be used without the consent of the municipal authority. While negotiating a dumping site all spoil shall be 	<ul style="list-style-type: none"> • To keep the site neat • Disposal of rubble and refuse in an appropriate manner • Reduction of soil and atmospheric pollution • Avoid litigation • Avoid Landowner complaints 	<ul style="list-style-type: none"> • No rubble or refuse lying around carelessly on site • No concrete spillage observed on site • No incidence of pollution observed • No legal charges • Landowners do not complain about in proper rubble and waste disposal
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	<p>compacted and the pile must not exceed 2m to avoid visual impact. Furthermore, the piled spoil must be covered adequately with a tarpaulin to avoid the spread of dust especially during the dry season.</p> <ul style="list-style-type: none">• No hazardous material, e.g. oil or diesel fuel shall be disposed of in any unregistered waste site. All old parts, packaging, old oil, etc. shall be disposed of in the correct manner and in a proper area designated for such waste materials. Under no circumstances shall such waste be buried on site randomly.		
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	<ul style="list-style-type: none">• No material shall be left on site lying carelessly that may harm man or animals. Broken, damaged and unused nuts, bolts and washers shall be picked up and removed from site.• Excess concrete may not be dumped randomly on site, but shall be disposed of in designated areas as agreed by the Landowner.• Concrete trucks shall not be washed on site after depositing concrete into foundations. Any spilled concrete shall be cleaned up immediately.• Dispose of all visible remains of excess cement and concrete		
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	<p>after the completion of tasks. Dispose of in the approved manner (solid waste concrete may be treated as inert construction rubble, but wet cement and liquid slurry, as well as cement powder must be treated as hazardous waste)</p>		
<p>Fire prevention</p>	<ul style="list-style-type: none"> • Lighting of fire on site for comfort during winter or for cooking etc is prohibited. • Smoking of cigarette, burning of grass and waste materials on site is not allowed. • The Contractor shall have fire-fighting equipment available on all vehicles working on site, 	<ul style="list-style-type: none"> • Minimize risk of fires on remaining vegetation and adjacent properties • Prevent wild fires 	<ul style="list-style-type: none"> • No occurrence of fire caused by the Contractor's work force • No claims from Landowners for damages due to wild fire from the construction site • No legal charges

	<p>especially during the winter months.</p> <ul style="list-style-type: none">• Take adequate precautions to ensure that fires are not started as a result of Works on site: the Contractor will be held liable for any damage to property adjoining the Site as a result of any fire caused by one of his employees.• Ensure that the Work Site, the contractor's camp and all living quarters are equipped with adequate firefighting equipment. This includes at least rubber beaters when working in veld areas, and at least one fire extinguisher of the		
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	<p>appropriate type irrespective of the site.</p> <ul style="list-style-type: none">• Take immediate steps to extinguish any fire which may break out on the construction site.• No open fires are permitted anywhere on site.• Restrict contained fires for heating and cooking (i.e. in a fire drum) to designated areas on site.• Prevent employees from creating fires randomly outside designated areas.• Do not store any fuel or chemicals under trees.• Do not store gas and liquid fuel in the same storage area.• Do not permit any smoking within 3m of any		
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	<p>fuel or chemical storage area, or refuelling area.</p> <ul style="list-style-type: none"> • Establish and maintain fire breaks around the Work Sites if as and when specified by the ECO and as required by applicable legislation and the local authority. 		
Vehicle Servicing onsite	<ul style="list-style-type: none"> • Vehicles servicing is not allowed on site, however emergency repairs could be conducted in a responsible manner. That is during emergency maintenance of construction vehicles a container should be placed underneath the vehicle to collect spilled oil. 	<ul style="list-style-type: none"> • To prevent environmental pollution • Minimize actions leading to environmental pollution 	<ul style="list-style-type: none"> • No pollution of the environment • No litigation due to contravention of pollution control acts • No complaints from Landowners

	<ul style="list-style-type: none"> • A designated area within the construction camp should be used for emergency servicing of vehicles. In case of any oil spillage during maintenance it should be cleaned up instantly. • Contaminated soil from oil spill must be collected and put in a container and a bioremediation treatment will be done on it by a specialist for bioremediation of contaminated soil 		
<p>Claims for damages</p>	<ul style="list-style-type: none"> • All damages on adjacent properties will be recorded appropriately by the ECO. Photos of such damages must be 	<ul style="list-style-type: none"> • Minimize complaints from Landowners • Prevent litigation due to outstanding claims 	<ul style="list-style-type: none"> • All claims investigated and settled within one month • No litigation due to unsettled claims

	<p>captured and the date, time of damage, type of damage and reason for the damage shall be recorded in full to ensure that the responsible party is held liable.</p> <ul style="list-style-type: none"> • The owners of the properties where the damages occur must be duly compensated after an appropriate appraisal of the damage is done. The Contractor shall be held liable for all unnecessary damage to the environment; animals and crops. • A register shall be kept of all complaints from Landowners. All claims shall be handled immediately to ensure 	<ul style="list-style-type: none"> • Successful completion of the contract and all Landowners signing release forms 	<ul style="list-style-type: none"> • All Landowners signing release forms within six months after completion of the contract
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	timeous rectification / payment.		
Gate installation and gate control	<ul style="list-style-type: none"> • A secured fence and gate must be constructed around the construction site. All gates shall be fitted with locks and be kept locked at all times during the construction phase. Claims resulting from gates left open will be investigated and settled in full by the contractor. • No one must be allowed through the gate that is not part of the construction team. • A record should be kept on all those visiting the site which must include name, company name, 	<ul style="list-style-type: none"> • Properly installed gates to control access to the construction site • Minimize damage to fences • Limit access to client and Contractor personnel with gate key 	<ul style="list-style-type: none"> • No transgressions of the fencing act and therefore no litigation • All gates equipped with locks and kept locked at all times to limit access to site • All fences properly tied off to the gate posts • All gates properly and neatly installed according to specifications • No complaints or claims due to open gates

	<p>and purpose of visit, contact number, time-in and time-out and signature.</p> <ul style="list-style-type: none"> • A security guard must be assigned to control access through the gate. 		
Batching Plants	<ul style="list-style-type: none"> • The setting of batching plants shall be carefully selected to minimize negative environmental impact. The batching plant area shall be operated in such a way as to prevent contaminated water to run off the site and pollute nearby streams or water bodies. To this effect diversion berms can be installed to direct all wastewater to a storm water channel. 	<ul style="list-style-type: none"> • To ensure all agreements with Landowners are adhered to • To prevent complaints from stakeholders • To ensure successful rehabilitation of disturbed areas • To ensure appropriate management of natural resources 	<ul style="list-style-type: none"> • No complaints from stakeholders • All disturbed areas successfully rehabilitated three months after completion of the contract • No misuse of natural resources for example water is observed

	<ul style="list-style-type: none">• The developer shall ensure that all agreements reached with the Landowner are fulfilled, and that such areas be rehabilitated once construction is completed.• Should any claim be instituted against the developer, due to the actions of the Contractor at a batching plant site, developer shall hold the Contractor fully responsible for the claim until such time that the Contractor can prove otherwise with the necessary documentation.• Should the Contractor be required to use water		
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	<p>from a natural source, the Contractor shall supply a method statement to that effect.</p> <ul style="list-style-type: none"> • Strict control shall be maintained and the ECO shall regularly inspect the abstraction point and methods used. 		
Wet areas	<ul style="list-style-type: none"> • Vehicles will not be allowed to use wet areas other than the access road. Only existing roads through such areas may be used with the approval of the project manager and the Landowner. • No equipment shall be used which may cause irreparable damage to wet areas. The contractor shall use alternative 	<ul style="list-style-type: none"> • Avoid wet areas to prevent damage • Avoid the destruction of wetland habitat 	<ul style="list-style-type: none"> • No damage wet areas from construction activities • Wetland habitat is intact • No complaints from landowners and litigation

	<p>methods of construction in such areas.</p> <ul style="list-style-type: none">• Maintain buffer width of 15 m on HGM 1 (wetland) and the drainage feature.• The layout of the development should be informed by the freshwater delineations, where areas of low sensitivity are favourable for the proposed development.• Do not dump waste of any nature, or any foreign material into any drainage line or wetland.• Do not allow the use of any drainage line or wetland for swimming, bathing, or the cleaning of clothing, tools or equipment.		
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	<ul style="list-style-type: none"> • Prevent the discharge of water containing polluting matter or visible suspended materials directly into drainage lines or wetlands. • Do not locate any reservoir, dam or depot for any substance which causes or is likely to cause pollution within the 1:100 year floodline, or within a horizontal distance of 100m (whichever is greater) of a watercourse, drainage line or identified wetland. 		
Handling Hazardous substances	<ul style="list-style-type: none"> • All hazardous substances shall be stored in suitable containers and storage areas shall be isolated and access to it restricted. 	<ul style="list-style-type: none"> • Prevent soil contamination due to the spillage of hazardous substances 	<ul style="list-style-type: none"> • No incidence of soil contamination due to spillage of hazardous substances

	<p>This includes all carbon substances like fuel and oil as well as herbicides and battery acid.</p> <ul style="list-style-type: none"> • A register shall be kept on all substances and be available for inspection at all times. • Areas shall be monitored for spills and any spills shall be contained, cleaned and rehabilitated immediately. Any leaking containers shall be repaired or removed from site. • Storage areas shall display the required safety signs depicting “No smoking”, “No naked lights” and “Danger”. • Containers shall be clearly marked to indicate 	<ul style="list-style-type: none"> • Prevent fire occurrence as a result of poorly handled hazardous substances • Avoid air pollution from hazardous substances 	<ul style="list-style-type: none"> • No incidence of fire occurrence from poorly handled hazardous substances • No air pollution from hazardous substances experienced
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	<p>contents as well as safety requirements.</p> <ul style="list-style-type: none">• The contractor shall supply a method statement for the storage of hazardous materials at tender stage.• Retain waste oils and batteries for recycling by the supplier wherever possible• Regularly dispose of all hazardous waste not earmarked for reuse, recycling or resale (such as oil contaminated with chlorinated hydrocarbons, electrical cleaning solvent, certain chemicals and fluorescent tubes) at a registered hazardous waste disposal site.		
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Social issues: Objectives and Measurable targets

Social Issues	management	Objectives	Measurable targets
Sanitation	<ul style="list-style-type: none"> • The Contractor shall install mobile chemical toilets on site. Staff shall be sensitized to use these toilets at all times. • No use of the veld shall be allowed, as this always creates problems with the landowners and may lead to claims for problems with stock diseases. • Toilet paper is also a source of littering, and the Contractor shall be forced to clean up any litter. • Chemical toilets must be serviced regularly by a specialized company and 	<ul style="list-style-type: none"> • Ensure that proper sanitation is achieved 	<ul style="list-style-type: none"> • No complaints received from Landowners regarding sanitation

	proof of service must be presented to the ECO.		
Interaction with adjacent landowners	<ul style="list-style-type: none"> The project team leaders must build a good relationship with the adjacent landowners to facilitate a successful implementation of the project. To this effect the contractor should appoint a community liaison officer who will be in charge of gathering information from the community on problems arising from the project sites and report to the project management team for prompt action. All negotiations for any reason shall be between the proponent of the 	<ul style="list-style-type: none"> Maintain good relations with Landowners 	<ul style="list-style-type: none"> No delays in the project due to Landowner interference Landowner signs final release form Landowners issue happy letter at the end of the construction

	<p>development and the landowners and the Contractor.</p> <ul style="list-style-type: none">• No verbal agreements shall be made.• All agreements shall be recorded properly and all parties shall co-sign the documentation.• It is proposed that a photographic record of access roads be kept. This will then be available should any claims be instituted by any Landowners.• Should there be any claim made by a landowner, it shall be investigated and treated promptly. Unnecessary delays should be avoided at all costs.• The Landowners shall always be kept informed		
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	<p>about any changes to the construction Programmed should they be involved.</p> <ul style="list-style-type: none">• If Environmental Control Officer is not on site the Contractor's liaison Officer should keep the Landowners informed. The contact numbers of the Contractor's liaison officer, the proponent of the development and ECO shall be made available to the Landowners. This will ensure open channels of communication and prompt response to queries and claims.• All contact with the Landowners shall be courteous at all times.• The rights of the Landowners shall be		
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	<p>respected at all times and all staff shall be sensitized to the effect that they are working around private properties.</p> <ul style="list-style-type: none"> • No one from the construction workforce should trespass into adjacent farms to harvest crops without a written permission from the landowner. 		
Littering	<ul style="list-style-type: none"> • Littering onsite by employees and all visiting the site must not be tolerated. The Environmental Control Officer shall monitor and ensure that the site and construction camp are clean. 	<ul style="list-style-type: none"> • To ensure a clean worksite and camp 	<ul style="list-style-type: none"> • No complaints regarding littering

	<ul style="list-style-type: none">• All waste generated by the employees on site must be collected at the end of the day and disposed of appropriately.• Trash bins must be provided by the contractor onsite for the collection of waste.• Collect all domestic waste in adequate numbers of litter bins located as required on the Work Site and within the Contractors camp.• For linear projects, provide litter bins at regular positions, with spacing not exceeding 100m throughout the Work Site.• Ensure that personnel make use of the litter bins provided. Keep all Work		
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	<p>Sites and at the Contractors camp tidy and litter free at all times.</p> <ul style="list-style-type: none"> • Empty litter bins weekly (or as required before they reach capacity) 		
Noise	<ul style="list-style-type: none"> • In order to prevent noise impacts resulting from construction activities, working hours are to be limited to weekdays between 07h00 to 17h00. If certain construction requires work outside of these hours, all adjacent landowners have to be informed prior to any construction outside of the specified hours commencing. • Respond to community complaints with regard to 	<ul style="list-style-type: none"> • To minimize noise around the construction site 	<ul style="list-style-type: none"> • No complaints from adjacent landowners regarding noise

	noise generation, taking reasonable action to ameliorate the impact		
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Cultural issues: Objectives and Measurable targets.

Cultural Issues	Management	Objectives	Measurable target
Residential property	<ul style="list-style-type: none"> The Contractor shall under no circumstances interfere with the property of adjacent landowners. If water is required, the Contractor shall negotiate with the relevant Landowner and a written agreement shall be drawn up. Wood obtained from de-bushing and de-stumping remains the property of the landowner and must be stockpiled in areas designated by him and approved by the ECO. 	<ul style="list-style-type: none"> Control over actions and activities in close proximity to inhabited areas 	<ul style="list-style-type: none"> No complaints from Landowners No damage to private property

	<ul style="list-style-type: none"> • The Project Manager will indicate whether or not it is necessary to keep a photographic record of temporary or permanent rights of way over private property as permitted during construction • Protect and maintain existing private property, fences and gates 		
Archaeology	<ul style="list-style-type: none"> • Should any artifacts be uncovered during construction, all work should stop and their existence be reported to an ECO immediately. An archaeologist will take the necessary action so that construction can continue. No artifacts or bacteria may be 	<ul style="list-style-type: none"> • Protection of archaeological sites and land considered to be of cultural value • The preservation and appropriate management of new archaeological discoveries should these be discovered during construction 	<ul style="list-style-type: none"> • No destruction of or damage to archaeological sites • Management of existing sites and new discoveries in accordance with the recommendations from the Archaeologist

	<p>removed without the necessary permit from SAHRA.</p> <ul style="list-style-type: none"> • Slight deviations of alignment are permitted, so as to avoid significant vegetation specimens and communities, natural features and sites of cultural and historical significance. These deviations must be approved by the ECO. 		
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12. REHABILITATION

- Once construction is completed, all redundant infrastructure, waste and construction materials should be removed immediately from site by the contractor and disposed of in an appropriate manner, i.e. at a registered site. This includes any wastes that may have been left at the site from previous activities on the site.
- Disturbed areas, which are to remain free of development, should be rehabilitated to a state comparable to the surroundings area. A need for this will be identified by the Environmental Control Officer.
- Stockpiled topsoil should be used as the final cover for all disturbed areas where re-vegetation is required. This is to take place as soon as possible after the civil work is complete.

- Stockpiles of material and waste will be removed after construction with the area fully rehabilitated.
- Rehabilitation and re-vegetation only to make use of indigenous and endemic species.
- Do not stockpile topsoil in heaps exceeding 2m in height.
- Store stripped topsoil in an approved location and in an approved manner for later reuse in the rehabilitation process.
- Ensure that all access roads utilised during construction (which are not earmarked for closure and rehabilitation) are returned to a usable state and / or a state no worse than prior to construction

13. MONITORING

- Regular monitoring of all the environmental management measures and components shall be carried out by the ECO.
- Inspections and monitoring shall be carried out on both the implementation of the EMPr and the impact on plant and animal life.
- Visual inspections on erosion and physical pollution shall be carried out on a regular basis.
- During the undertaking of the project massive dust will be produced in the construction phase and as a result dust suppressing systems should be implemented.
- Continuous dust suppressing systems shall be monitored on a monthly basis to determine the impact on the proposed development.
- Limit the production of dust and damage caused by dust through regular watering of the work areas.

- Avoid over-wetting, saturation and unnecessary runoff during dust control activities
- Dust from the construction site must not disturb economic or social activities in the vicinity of the construction site.
- Ensure that employees are issued with and make use of the necessary safety equipment when working in dusty, noisy and / or dangerous situations. Such equipment may include, but is not necessarily limited to hardhats, goggles, masks, earplugs, gloves, safety footwear and safety ropes as required

14. ENVIRONMENTAL AUDIT

An environmental audit will be conducted during the establishment of the project. This environmental audit will ensure that:

- The conditions stipulated in the Environmental Authorisation are adhered to;
- Mitigation measures are implemented as prescribed in the Environmental Management Programme;
- The relevant authorities are kept informed about progress in the project and that they are given assurance that the project is implemented as prescribed by them, and
- The ECO will undertake monthly environmental audits during construction; and few months of operation of the battery storage facility. The ECO will be responsible for monthly environmental audits verifying compliance to the approval EMPr.

15. RESPONSIBLE PARTIES

- Responsibility for the implementation of the EMPr lies with LTM Green Energies.
- This responsibility will be delegated to the contractor for practical purposes, but the developer will retain legal responsibility.
- On-site assistance, monitoring of construction (to ensure compliance with this EMPr) environmental reporting will be the responsibility of the site manager.
- The ECO will be responsible for monthly environmental audits verifying compliance to the approved EMPr. During every site meeting a summary report will be given by the ECO, which will summarise compliance and non-compliance to the regulations set out in the approved EMPr.
- The Department of forestry, Fisheries and Environment is responsible for approving this document and any amendments to it.

16. REQUIREMENTS DURING CONSTRUCTION

- Proper and continuous liaison between LTM Green Energies and the Contractor to ensure every party is informed at all times.
- A physical access plan shall be compiled and the Contractor shall adhere to this plan at all times. Proper planning when the physical access plan is drawn up by the Environmental Control Officer in conjunction with the Contractor shall be necessary to ensure access to all construction areas within the parameter.
- The adjacent landowners shall be informed of the starting date of construction as well as the phases in which the construction shall take place.
- The Contractor must adhere to all conditions of contract, including the Environmental Management Programme.
- Proper planning of the construction process to allow for disruptions due to rain and very wet conditions.
- Where existing private roads are in a bad state of repair, such roads' condition shall be documented before they are used for construction purposes. If necessary, some repairs should be done to prevent damage to equipment and plants.
- All manmade structures shall be protected against damage at all times and any damage shall be rectified immediately.
- Proper site management and regular monitoring of site works.
- Proper documentation and record keeping of all complaints and actions taken.
- Regular site inspections and good control over the construction process throughout the construction period.
- Environmental Audits to be carried out during and upon completion of construction.

- The Contractor shall not be released from site until all Landowners have signed off the release documentation to the satisfaction of the Environmental Control Officer.

13. CONCLUSIONS

This EMPR incorporates the relevant requirements of best environmental practises and specific environmental management measures relating to the design, construction and operational phases of the proposed development. Under NEMA (Act No. 107 of 1998), the Environmental Impact Assessment (EIA) Regulations require an assessment of potential environmental impacts throughout the lifecycle of a project, including decommissioning. The EIA process should consider the end-of-life phase of the facility, including decommissioning plans and potential impacts.

The National Environmental Management: Waste Act (Act No. 59 of 2008) governs waste management, including hazardous waste which may be produced during the decommissioning of a battery storage facility. This Act requires proper management and disposal of hazardous waste, including lead-acid batteries or lithium-ion batteries, which may be involved in a battery storage facility. Continuous compliance with this Act during operation and decommissioning phases shall not be compromised. Proper disposal and handling of hazardous materials shall be encouraged

The Occupational Health and Safety Act (Act No. 85 of 1993) requires safety measures to protect workers during all phases of construction, operation, and decommissioning. Decommissioning activities must follow safety protocols to ensure worker safety and manage risks associated with hazardous materials. Safety regulations must be continuously adhered to throughout the facility's lifecycle. Implementation of safety measures during the decommissioning phase must be implemented, safety records must be kept and all activities must be in compliance with OHS requirements.

The decommissioning of the Battery storage facility will be done when it has reached its lifespan. If the management measures included in this EMPR are followed and adhered to, there should be no major issues or residual impacts which the LTM Green Energies (Pty) Ltd will experience due to the proposed development of the Battery storage facility.

This EMPR will be submitted to DFFE for approval. The competent authority may request for a review of the EMPR at any stage of the project if they feel that the mitigation measures proposed are not adequate. LTM Green Energies will be responsible for any further updating of this EMPR, as appropriate. This EMPR is a binding document and compliance with the EMPR forms part of the contract documents of all contractors and sub-contractors working on the project.