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**ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR) FOR THE  
PROPOSED THARISA BATTERY ENERGY STORAGE SYSTEM (BESS)  
DEVELOPMENT, WITHIN RUSTENBURG LOCAL MUNICIPALITY,  
BOJANALA PLATINUM DISTRICT MUNICIPALITY, NORTHWEST  
PROVINCE.**

**MANYABE CONSULTANCY (PTY) LTD PROJECT CODE: 202615**

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## GLOSSARY OF TERMS

Alien species	Plants and animals which do not arrive naturally in an area - they are brought in by humans. Alien plants often force indigenous species out of the area.
Aspect	Element of an organisation's activities, products or services that can interact with the environment.
Biodiversity	The rich variety of plants and animals that live in their own environment. Fynbos is a good example of rich biodiversity in the Cape.
Conservation	Protecting, using and saving resources wisely, especially the biodiversity found in an area.
Contractor	The main Contractor as engaged by Tharisa for the construction of the subject infrastructure, including all subcontractors and service providers appointed by the main Contractor of his own volition for the execution of parts of the Works. "Contractor" also includes any other Contractor engaged by Tharisa Minerals (Pty) Ltd (Tharisa) directly in connection with any part of the construction operations, which is not a nominated sub-contractor to the main Contractor.
Contamination	Polluting or making something impure.
Environment	Our surroundings, including living and non-living elements, e.g. land, soil, plants, animals, air, water and humans. The environment also refers to our social and economic surroundings, and our effect on our surroundings.
Environmental Control Officer	A person who is responsible for the monitoring of the implementation of the requirements of Environmental Management Programme (EMPr).
Environmental Officer	A person who is responsible for the implementation of the requirements of EMPr.
Environmental Impact	An environmental change caused by some human act.
Impact	A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.
Indigenous species	Plants and animals that are naturally found in an area.
Integrated Environmental Management (IEM)	A way of managing the environment by including environmental factors in all stages of development. This includes thinking about physical, social, cultural and economic factors and consulting with all the people affected by the proposed developments.
Land use	The use of land for human activities, e.g. residential, commercial, industrial use.
Method Statement	Setting out in detail how the management actions contained in an EMPr will be implemented, in order to ensure that the environmental objectives are achieved.
Mitigation	Measures designed to avoid, reduce or remedy adverse impacts.
Natural environment	Our physical surroundings, including plants and animals, when they are unspoiled by human activities.
Public Participation Process	A process of involving the public in order to identify needs, address concerns, in order to contribute to more informed decision making relating to a proposed project, programme or development.
Stakeholders	A subgroup of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term includes the proponent, authorities and all interested and affected parties.
Storm water management	Strategies implemented to control the surface flow of storm water such that erosion, sedimentation and pollution of surface and ground water resources in the immediate and surrounding environments are mitigated. This is specifically important during the construction and decommissioning (if applicable) phases of a project.
Wetlands	An area of land with water mostly at or near the surface, resulting in a waterlogged habitat containing characteristic vegetation species and soil types e.g. vleis, swamps.

## LIST OF ABBREVIATIONS

AIPs	Invasive Plant species
BBBEE	Broad Based Black Economic Empowerment
BESS	Battery Energy Storage System
CV	Curriculum Vitae
DEAT	Department of Environmental Affairs and Tourism
DFFE	Department of Forestry, Fisheries and the Environment
DPM	Diesel Particulate Matter
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
EO	Environmental Officer
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
Fe-Cr	Iron Chromium

GDEnv	Gauteng Department of Environment
GN	Government Notice
IEM	Integrated Environmental Management
km	kilometres
kWh	kilowatt
MC	Manyabe Consultancy (Pty) Ltd
MEC	Member of the Executive Committee
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMAQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMPA	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)
NEMWA	National Environmental Management: Waste Management Act, 2008 (Act No. 59 of 2008)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
NWDARD	North West Department of Agriculture and Rural Development
OHSA	Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)
PPE	Personal Protective Equipment/ Clothing
PV	photovoltaic
RE	Engineer Representative
SABS	South African Bureau of Standards
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resources Agency
SANS	South African National Standards
SCC	Species of Conservation Concern
SHE	Safety, Health and Environmental
SWMP	Stormwater Management Plan
TUT	Tshwane University of Technology
UNISA	University of South Africa

## SECTION 1: PROJECT INTRODUCTION AND BACKGROUND

### 1-1 INTRODUCTION

Tharisa Minerals (Pty) Ltd (hereunder referred to as Tharisa), a subsidiary of Tharisa Public Limited Company (Tharisa plc) who operates Tharisa Mine, is pursuing initiatives to reduce the carbon footprint associated with its mining activities in support of Tharisa plc broader commitments to sustainability and operational decarbonisation.

As part of this strategy, Tharisa (the Applicant) is implementing a photovoltaic (PV) solar power system to supply clean energy to the Administration and Training Centre facilities at the Tharisa Mine. To maximise the benefits of this renewable energy investment and to ensure reliable power availability during morning and evening peak loads, a Battery Energy Storage System (BESS) capable of storing excess solar generation is required. The BESS Development is designed to store electricity and provide immediate power when needed. This improves grid stability, supports renewable energy integration, offers ancillary services, helps manage network constraints, and aids in meeting peak demand.

Manyabe Consultancy (Pty) Ltd (MC) has been appointed as an Independent Environmental Assessment Practitioner (EAP), to undertake the registration process on behalf of Tharisa. In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended (NEMA), and the adopted Norm for the Exclusion of Identified Activities Associated with the Development and Expansion of Battery Storage Facilities in Areas of Low or Medium Environmental Sensitivity which allows for the exclusion from the requirement to obtain an Environmental Authorisation (EA) from the competent authority for listed and specified activities identified in Paragraph 3 of the Norm, in terms of Government Notice (GN). 4557, published in Gazette No. 50387, 27 March 2024, Tharisa intends to submit registration for exclusion from the requirement to obtain an EA for the proposed Tharisa BESS Development.

### 1-2 BACKGROUND

Redox One, a developer and manufacturer of Iron Chromium (Fe-Cr) flow batteries for industrial scale energy storage, is uniquely positioned to support this requirement. Arxo Metals (Pty) Ltd (hereunder referred to as Arxo Metals) currently manufactures the Fe-Cr electrolyte used in these batteries; utilising materials sourced from the Tharisa Mine. Redox One proposes to implement a demonstration project by installing its Redox Flow Battery (RFB) 625 BESS, enabling a micro grid solution that delivers clean, reliable energy to the Administration and Training Centre facilities, while showcasing the performance of Fe-Cr flow battery technology.

#### 1-2.1 Site Description

The proposed BESS Development will be located within the Tharisa Mine which is situated in both the Rustenburg Local Municipality and the Madibeng Local Municipality, forming part of the Bojanala Platinum District Municipality, North West Province. It must however be noted that the BESS Development footprint will be within the Rustenburg Local Municipality.

The site where the installation will be undertaken is positioned on Portion 317 of Farm K/Kraal 342 JQ, which is owned by Tharisa. The BESS Development will be deployed on the north western side of the Administration and Training Centre facilities, entirely within the existing mine boundary, on previously modified/disturbed land, thereby minimising additional land transformation.

#### 1-2.2 Energy Requirements

The combined daily energy demand for the Administration and Training Centre facilities is 920 kilowatt per hour (kWh) over a 24-hour cycle. The BESS Development is intended to meet this demand by storing excess solar

energy generated from the solar PV panels, during daytime hours, for use during morning and evening peak load periods at the Admin and Training Centre facilities.

### 1-3 PROJECT LOCALITY

The mining operation is located on the Farms K/Kraal 342 JQ, Rooikoppies 297 JQ and Elandsdrift 467 JQ, approximately 95 kilometres (km) north-west of Johannesburg and 35 km east of Rustenburg, accessible via the R104 regional road just off the N4 toll road. The proposed BESS Development will be located on Portion 317 of Farm K/Kraal 342 JQ (refer to Figure 1 for the Locality Map). The details of the site are as provided in Table 1 below.

**Table 1: Details of the Project Site**

Farm Name (s)	Portion 317 of Farm K/Kraal 342 JQ (refer to Figure 1 for the Locality Map).
21 digit Surveyor General Code	T0JQ0000000034200317
Application Footprint Area (Ha)	The total development footprint is approximately 1 200 m <sup>2</sup>
Farm Owner	Tharisa Minerals (Pty) Ltd
Province	North West
District Municipality	Bojanala Platinum District Municipality
Local Municipality	Rustenburg Local Municipality
Distance and direction from nearest town (s)	Tharisa mine is located approximately 4 km to the south of Marikana Town, in the North West Province
Facility Co-ordinates (approximate centre point)	25°44'29.21"S 27°29'33.78"E

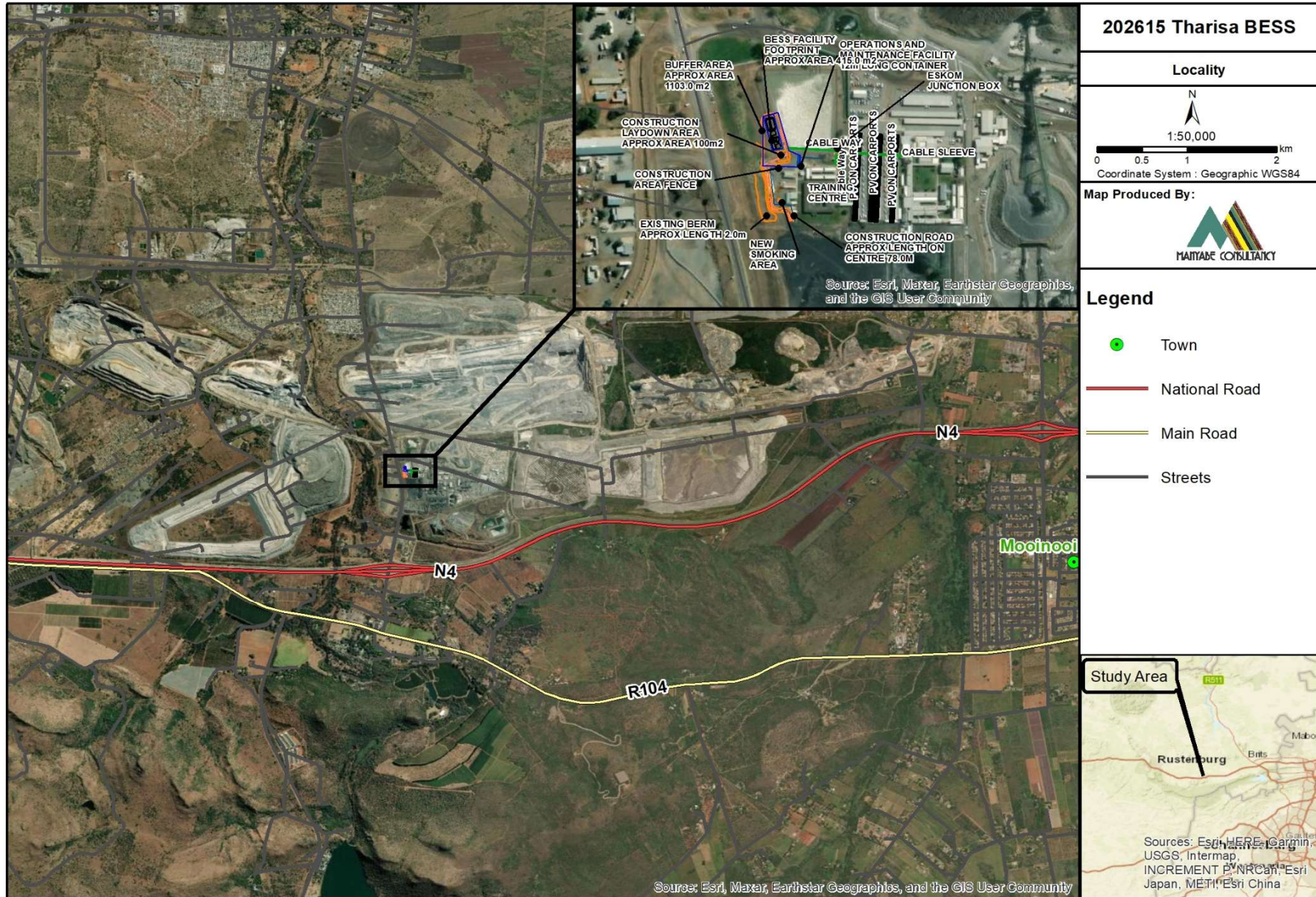


Figure 1: Locality of BESS Development

## SECTION 2: PROPOSED SOLAR PHOTOVOLTAIC SYSTEM AND BESS DEVELOPMENT

### 2-1 SOLAR SYSTEM

The BESS Development will integrate with a 250 kilowatt (kW) solar PV system, mounted on existing infrastructure (carports) and will connect to the existing Eskom Junction Box at the Mine using cabling. No new power lines will be constructed (Figure 2).

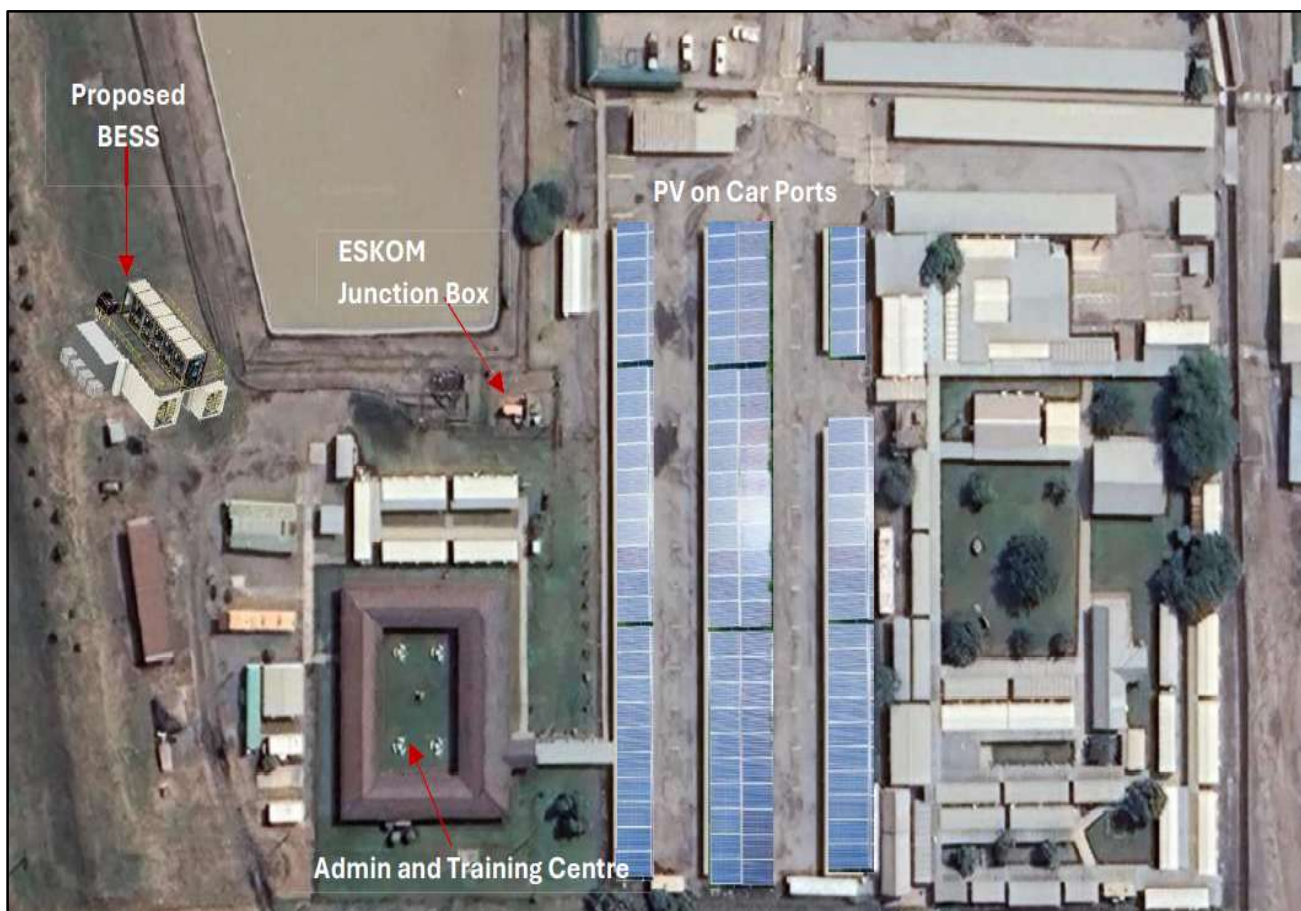


Figure 2: Location of the proposed BESS Development and Associated Infrastructure

### 2-2 THE SELECTED BATTERY SYSTEM

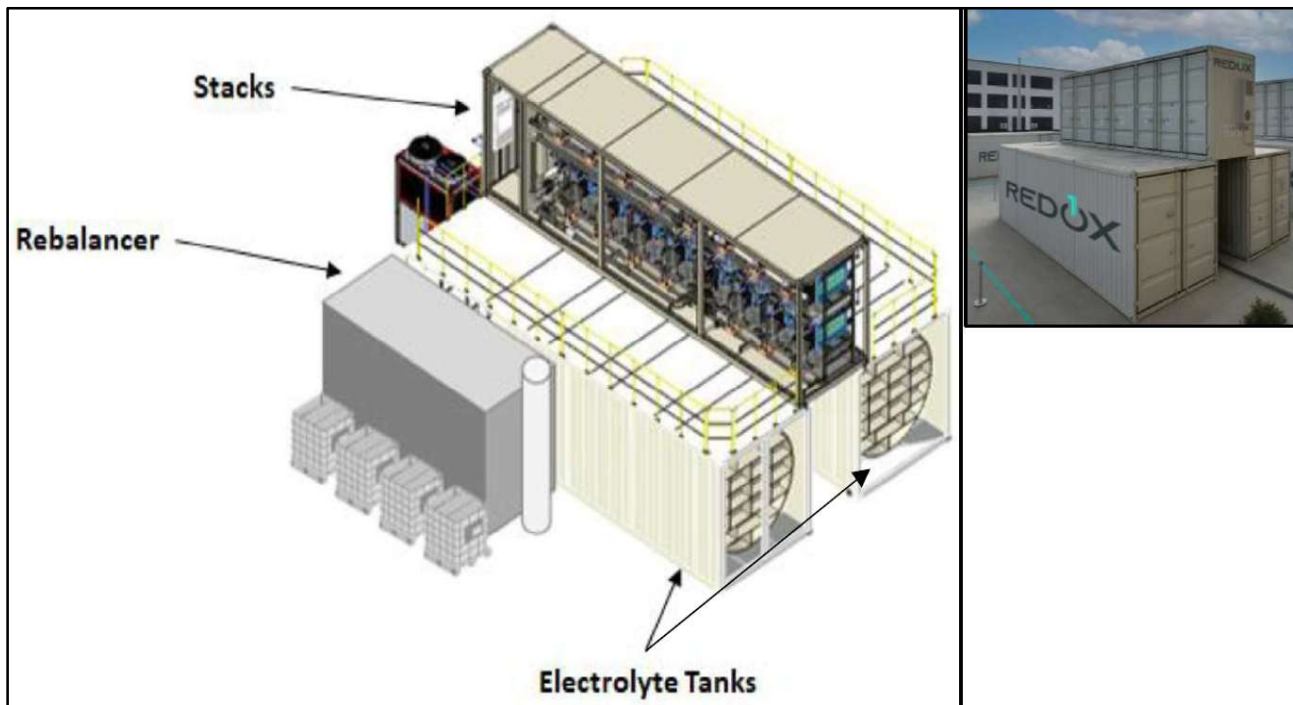
A Redox One RFB 625 Fe-Cr flow battery system is proposed for installation, selected for its suitability to the required load profile, its 150 kW power rating, and 500 kWh(AC) storage capacity. The system will be containerised and will include electrolyte storage tanks with a combined capacity of 86 m<sup>3</sup> (Fe-Cr/HCl electrolyte). These tanks will be housed within containers, with the electrochemical stacks installed above them, and a dedicated Rebalancer Unit positioned adjacent to the system (refer to Figure 3).

The Rebalancer Unit electrochemically maintains the capacity of the battery by reducing built-up ferric chloride [FeCl<sub>3</sub>(Aq)] in the positive electrolyte to ferrous chloride [FeCl<sub>2</sub>(Aq)]. The rebalancer requires chemicals with a total volume of 12 m<sup>3</sup>, comprising 5 m<sup>3</sup> hydrochloric acid (HCl), 5 m<sup>3</sup> sodium hydroxide (NaOH, 50%), and 2 m<sup>3</sup> Fe-Cr/HCl electrolyte. Intermediate bulk containers (IBCs) located in front of the rebalancer store process liquids will require regular replacement.

During operation, the rebalancer produces chlorine gas, which will be captured using a caustic scrubber, which will be safely vented to the atmosphere after scrubbing. Expected chlorine vent concentrations range from approximately 0.3 3 parts per million (ppm), with annual emissions estimated between 0.5 to 10 kg Cl<sub>2</sub>, depending on operating conditions. Electrochemical sensors will be installed to monitor gas releases, with an automated system shutdown triggered if threshold limits are exceeded.

To operate the battery with high efficiency, it is necessary to raise the temperature of the electrolyte. This task is performed by an external unit. The heating and cooling unit is a device designed to bring the battery's electrolyte to a temperature of 45 to 50°C and maintain it at this level, as the system's efficiency is optimal at this temperature.

To store energy in the battery and retrieve it when needed, an external converter is required. This function is performed by a Power Converting System from WindSun. It consists of an inverter equipped with a transformer and a grid connection.



**Figure 3: Schematic View of the Battery with the Rebalancer within Containers**

### 2-3 HAZARDOUS CHEMICALS AND WASTE MANAGEMENT

The electrolytes and rebalancer chemicals used in the system are classified as hazardous substances. All reagent and electrolyte storage tanks will be housed within a single bunded containment area designed to provide 110% secondary containment capacity, ensuring full compliance with applicable chemical storage and safety requirements.

The primary waste stream will be generated by the rebalancer scrubber system, which produces a mixture of sodium hypochlorite and sodium chloride. A 30 m<sup>3</sup> dedicated waste storage tank will be required to accommodate this waste prior to removal and disposal by a licensed waste management contractor.

Additionally, a bunded leakage sump with a volume of approximately 39 m<sup>3</sup> will be provided to safely collect and manage any spilled or leaked electrolyte. Small leaks and drips will be appropriately contained and disposed of. Waste collected in the sump will be disposed of at a licensed waste disposal facility. In the unlikely event of a large electrolyte spill, the electrolyte will be recovered and reused where feasible.

### 2-4 STORMWATER MANAGEMENT

A stormwater channel will be constructed around the plant to collect runoff and connect it to the existing mine stormwater management system. Any contaminated stormwater within the facility will be directed to the sump for collection and disposal at a licensed waste disposal facility.

### 2-5 PROJECT DEVELOPMENT OVERVIEW

The proposed BESS development will be constructed within a footprint of approximately 1 200 m<sup>2</sup> as shown in Figure 4. The following components (Table 2) are applicable to the proposed project:

**Table 2: Summary of Tharisa BESS Development Project Components**

Component	Description / Dimensions
BESS Development Footprint	<p>The total development footprint is approximately 1 200 m<sup>2</sup> and comprises the following components:</p> <ul style="list-style-type: none"> <li>• A BESS Development with an approximate footprint of 400 m<sup>2</sup> comprising battery storage tanks &amp; stacks, a PCS unit, heating and cooling unit, a rebalancer unit, a storage area for rebalancer consumables (IBCs) and a leakage sump.</li> <li>• An operations and maintenance facility for safety equipment and routine cleaning equipment storage.</li> <li>• Internal access road.</li> <li>• A construction laydown area.</li> <li>• Stormwater management channel.</li> <li>• Perimeter fencing.</li> </ul>
BESS Development Technology	<ul style="list-style-type: none"> <li>• Redox One RFB625 Fe-Cr Flow Battery System Electrolyte solution: HCl based Fe-Cr electrolyte.</li> </ul>
Battery Performance	<ul style="list-style-type: none"> <li>• Rated charge/discharged power: 150kW (16 stacks of 9kW each in 2 strings).</li> <li>• DC-voltage Range: 473.6 710.4 V.</li> <li>• Nom. DC Current: 314A.</li> <li>• Response time: 100ms.</li> </ul>
Battery Lifespan	<ul style="list-style-type: none"> <li>• Approximately 25 years.</li> </ul>
Usable energy	<ul style="list-style-type: none"> <li>• 500kWh (AC).</li> </ul>
Solar System	<ul style="list-style-type: none"> <li>• 250 kW generation capacity.</li> <li>• 455 PV panels mounted on existing infrastructure (car ports).</li> </ul>
Electrolyte Storage	<ul style="list-style-type: none"> <li>• Combined tank capacity: 86 m<sup>3</sup> (Fe-Cr/HCl electrolyte), housed within containers.</li> </ul>
Rebalancer Unit	<ul style="list-style-type: none"> <li>• Installed adjacent to containers with a total chemical volume of 12 m<sup>3</sup>.</li> <li>• Chemical breakdown for rebalancer: 5 m<sup>3</sup> HCl; 5 m<sup>3</sup> NaOH (50%); 2 m<sup>3</sup> Fe-Cr/HCl electrolyte</li> </ul>
Heating and cooling Unit	<ul style="list-style-type: none"> <li>• Unit for maintaining the electrolyte at temperature.</li> <li>• Euroklimat/Sanhe Tongfei Refrigeration Co. Ltd, ECA- 50HR-01CSZ3-1237C.</li> <li>• Ancillary consumption: Maximum 120 kW (only during the heating phase).</li> </ul>
PCS	<ul style="list-style-type: none"> <li>• Inverter system for connecting the battery to the power grid.</li> <li>• WindSun FGPCS-440K/0.28.</li> </ul>
Voltage Cabling	<ul style="list-style-type: none"> <li>• 400 V cables will be installed underground, with cable racking used where technically feasible, to connect the BESS Development to the Eskom junction box.</li> </ul>
Internal Road	<ul style="list-style-type: none"> <li>• An access road will be constructed to the BESS Development for both the construction and operational phases. The road will be approximately 135 m in length and 4 m wide, with a footprint of approximately 540 m<sup>2</sup>.</li> </ul>
Construction Laydown Area	<ul style="list-style-type: none"> <li>• A temporary laydown area of approximately 100 m<sup>2</sup> will be required for construction.</li> </ul>
Operations and Maintenance Facility	<ul style="list-style-type: none"> <li>• An operations and maintenance container for the storage of safety equipment and day cleaning equipment will be required, with a footprint of approximately 36 m<sup>2</sup>.</li> </ul>
Fencing	<ul style="list-style-type: none"> <li>• Fencing will be installed around the entire BESS Development, including the access road, to restrict unauthorised entry.</li> </ul>



Figure 4: Site Layout for the proposed Tharisa BESS Development

## SECTION 3: ENVIRONMENTAL MANAGEMENT PROGRAMME

### 3-1 PRINCIPLES OF THIS ENVIRONMENTAL MANAGEMENT PROGRAMME

This Environmental Management Programme (EMPr) is compiled using the following concepts and implementation requirements so that the higher principles of sustainable development are realised:

- **Continuous improvement.** Tharisa must commit to review and to continually improve environmental management, with the objective of improving overall environmental performance.
- **Broad level of commitment.** A broad level of commitment is required from all levels of management as well as the workforce in order for the development and implementation of this EMPr to be successful and effective.
- **Accountability.** A strong sense of accountability should be maintained by the Tharisa and its Contractor to prevent any party from distancing itself from commitments made to the EMPr.
- **Flexible and responsive.** The implementation of the EMPr must respond to new and changing circumstances, i.e. rapid short-term responses to problems or incidents. The EMPr is a dynamic “living” document and thus regular planned review and revision of the EMPr must be carried out.
- **Integration across operations.** This EMPr must integrate across existing line functions and operational units such as health, safety and environmental departments. This is done to change the redundant mindset of seeing environmental management as a single domain unit.
- **Legislation.** It is understood that any project during all its phases, is a dynamic activity within a dynamic environment. Tharisa and the Contractor must therefore be aware that certain activities conducted during the construction, operation and decommissioning phases may require further licensing or environmental approval, e.g. bulk fuel storage, waste disposal, etc. The Environmental Control Officer (ECO) must be consulted on a regular basis.

### 3-2 PURPOSE OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

An EMPr is a blueprint designed to manage, mitigate, and monitor the environmental impacts of a specific project. Its core purpose is to prevent avoidable ecological damage and ensure that a development or operation complies with environmental laws and sustainable practices throughout its entire lifecycle.

The EMPr achieves this purpose through several primary objectives as detailed below:

### 3-3 OBJECTIVES OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

This EMPr has been compiled to provide recommendations and guidelines in order to minimise the potential environmental impacts during the construction, operation and decommissioning phases and it will be used as a compliance monitoring document that will always be available on site during the construction, operation and decommissioning phases. Tharisa must comply with the mitigation measures provided in the EMPr as it is a legal document, which will ensure prevention of anticipated potential environmental impacts.

The objectives of this EMPr are as follows:

- To give effect to construction, operation and decommissioning phases requirements;
- To give effect to the environmental commitments to the various role players;
- To ensure that these requirements/ commitments are expressed in a manner that is accessible to all parties and is binding upon those responsible during the construction, operation and decommissioning phases;
- To provide a coherent and pragmatic framework for the implementation of the requirements, ranging from the role and responsibility of Tharisa to comply with all mitigation measures that are set out on this EMPr;
- To facilitate appropriate and proactive response to unforeseen events or changes in the implementation mitigation measures; and

- To ensure that the project does not result in undue or reasonably unavoidable adverse environmental impacts.

The EMPr is compiled in accordance with the Integrated Environmental Management (IEM) philosophy which aims to achieve a desirable balance between conservation and development [Department of Environmental Affairs and Tourism (DEAT , 2004)]. IEM is a key instrument of the NEMA. NEMA promotes the IEM of activities that may have a significant effect on the environment, while IEM prescribes a methodology for ensuring that environmental management principles are fully integrated into all stages of the development process. It advocates the use of several environmental management tools that are appropriate for the various levels of decision-making. One such tool under the NEMA Chapter 5 is an EMPr.

The IEM guidelines encourage a pro-active approach to sourcing, collating and presenting information in a manner that can be interpreted at all levels.

### 3-4 SCOPE OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME

The scope of the EMPr must ensure that the objectives outlined above will be addressed. In order to achieve the above objectives, the scope of an EMPr should include the following:

- Definition of the environmental management objectives to be realised during the construction, operation and decommissioning phases in order to enhance benefits and minimise adverse environmental impacts.
- Description of the detailed actions needed to achieve these objectives, including how they will be achieved, by whom, by when, with what resources, with what monitoring/verification, and to what target or performance level. Mechanisms must also be provided to address changes in the project implementation, emergencies or unexpected events, and the associated approval processes.
- Clarification of institutional structures, roles, communication and reporting processes required as part of the implementation of the EMPr.
- Description of the link between the EMPr and associated legislated requirements.
- Description of requirements for record keeping, reporting, review, auditing and updating of the EMPr.

#### 3-4.1 Structure of an Environmental Management Programme

An EMPr focuses on sound environmental management practices, which should be undertaken to minimise adverse impacts on the environment through the lifetime of a development. In addition, an EMPr identifies which measures will be in place or will be actioned to manage any incidents and emergencies that may occur during undertaking of the project. This EMPr provides specifications that should be adhered to, in order to minimise adverse environmental impacts associated with the construction, operation and decommissioning phases.

According to Appendix 4 of GNR. 982, as amended, an EMPr must comply with section 24N of the Act and include (refer to Table 3 below):

**Table 3: Content of the EMPr**

Content of the EMPr	Section of the EMPr Complying to the Regulations
(a) <b>Details of:</b> (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae.	Section 4-1.1 and Appendix 1
(b) <b>a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;</b>	Section 6-1
(c) <b>a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;</b>	Figure 5
(d) <b>a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including—</b> (i) planning and design;	Section 6-1

Content of the EMPr	Section of the EMPr Complying to the Regulations
(ii) preconstruction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and in the case of a closure activity, closure; and (v) where relevant, operation activities;	
(f) <b>a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to –</b> (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practices; and (iii) comply with any applicable provisions of the Act regarding closure in the case of a closure activity;	Section 6-1
(g) <b>the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);</b>	SECTION 5: and 6-1
(h) <b>the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);</b>	SECTION 5: and 6-1
(i) <b>an indication of the persons who will be responsible for the implementation of the impact management actions;</b>	SECTION 5: and 6-1
(j) <b>the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;</b>	SECTION 5: and 6-1
(k) <b>the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);</b>	Section 5-2 and 6-1
(l) <b>a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;</b>	Section 5-3 and 6-1
(m) <b>an environmental awareness plan describing the manner in which—</b> (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 5-4 and 6-1
(n) <b>any specific information that may be required by the competent authority.</b>	Not Applicable

### 3-4.2 Legal Requirements of the Environmental Management Programme

The Bill of Rights – Chapter 2 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996), includes an environmental right (Section 24) according to which, “*everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation and the sustainable use of natural resources while promoting justifiable economic and social development*”.

In addition, Section 28 of the NEMA, provides for a duty of care approach which requires every person causing significant pollution or degradation of the environment, to take reasonable measures to prevent it from occurring, continuing or recurring. Therefore, in order to promote effective environmental management throughout the life cycle of a project (construction, operation and decommissioning phases), it is important that management actions prescribed in the EMPr are considered for the construction, operation and decommissioning phases.

According to the Department of Forestry, Fisheries and the Environment (DFFE), an EMPr can be defined as an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction of a project are prevented; and that the positive benefits of the project are enhanced.

Tharisa must comply with all South African National and Provincial environmental legislation, including associated regulations and all local by-laws relevant to the construction, operation and decommissioning phases. The key legislation currently applicable to the project, which must be complied with is as follows:

- The Constitution of the Republic of South Africa Act, 1996 (Act No. 108 of 1996);
- National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended (NEMA);
- National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA);
- National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEMAQA);
- National Environmental Management: Waste Management Act, 2008 (Act No. 59 of 2008) (NEMWA);
- National Water Act, 1998 (Act No. 36 of 1998) (NWA);

- Hazardous Substances Act, 1973 (Act No. 15 of 1973);
- National Heritage Resources Act, 1999 (Act No. 25 of 1999 (NHRA));
- Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) (OHSA);
- National Building Regulations and Standards Act, 1977(Act No. 103 of 1977) (SABS 0400);
- National Road Traffic Act, 1996 (Act No. 93 of 1996); and
- All relevant provincial legislation, municipal by-laws and ordinances.

### **3-5 INTEGRATION OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME INTO THE CONTRACT**

This EMPr has been written in a form and language that is consistent with the contract documentation for the contracts i.e. the EMPr takes the form of a set of environmental specifications that are being integrated into the contract documentation. There are various advantages to this approach:

- The Contractor is being made aware of the EMPr;
- The EMPr is being presented to the Contractor in the language and terminology with which he/she is familiar, and unnecessary duplication and contradiction is eliminated;
- Inclusion of the EMPr within the contract ensures that the EMPr becomes a legally binding document within a well-developed legal framework; and
- The standardised form and structure of the environmental specifications ensures that with time and each new contract, the Contractor becomes increasingly familiar with, and thus more accepting of, the EMPr and implements it with the same diligence as any other set of specifications contained within the contract.

Ultimately, by measuring compliance against an explicit set of environmental controls that are well located within a robust legal framework, the approach has been proven to enhance success in the implementation and enforcement of the EMPr significantly.

### **3-6 SPECIFICATION STRUCTURE AND APPLICATION**

These specifications are not exclusive and could, within reason, be expanded on or amended at any time during the contract by the Contractor.

#### **3-6.1 Method statements**

The environmental specification is underpinned by a series of Method Statements, within which the Contractor is required to outline how they propose to mitigate any identified environmental risks. In terms of the environmental specifications, the Contractors must submit various written Method Statements. For the purposes of the environmental specifications, a Method Statement is defined as “a written submission by the Contractor in response to the Specification or a request, setting out the materials, labour and method the Contractor proposes using to carry out an activity, identified by the relevant specification. The Method Statement must cover applicable details with regards to:

- Construction procedures;
- Materials and equipment to be used;
- Getting the equipment to and from site;
- How the equipment/ material will be moved while on site;
- How and where material will be stored;
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- Timing and location of activities;
- Compliance/ non-compliance with the Specifications; and
- Any other information deemed necessary by the Engineer.

The environmental specifications set very stringent requirements in terms of the provision of Method Statements and the commencement of the activities they cover:

- Any Method Statement required by the Engineer or the specification must be produced within the timeframes specified by the Engineer or the specification (typically two weeks);
- The Contractor may not commence the activity covered by the Method Statement until it has been approved, except in the case of emergency activities and then only with the consent of the Engineer;
- The Engineer may require changes to a Method Statement if the proposal does not comply with the specification or if the proposed methodology carries an unreasonable risk of excessive damage to the environment;
- Approved Method Statements must be readily available on the site and must be communicated to all relevant personnel;
- The Contractor is required to carry out the activities covered by the Method Statement in accordance with the proposed approach; and
- Approval of the Method Statement does not absolve the Contractor from their obligations or responsibilities in terms of the Contract.

The following specific method statements must be drawn up as part of this EMPr:

- Emergency spills, accidental leaks and fire procedures;
- Cement and concrete batching;
- Management of hazardous materials (including oils and chemicals);
- Solid waste management;
- Dust control management;
- Crew camps and construction lay down areas;
- Handling of stockpiles;
- Rehabilitation activities; and
- Clearance of vegetation during construction

### **3-6.2 Onsite documentation**

The following is a list of documentation that must be held on site during the construction, operation and decommissioning phases and must be made available on request:

- This EMPr;
- Site daily diary / instruction book / incident reports with incident registers;
- Records of all remediation / rehabilitation activities;
- Copies of Environmental Officer (EO) reports (management and monitoring);
- Complaints register; and
- Method statements.

### **3-6.3 Pro forma documentation**

#### ***3-6.3.1 Prior to the commencement of development activities***

The following pro forma documentation is to be filled out and is binding to the EMPr and project contract and includes *inter alia*:

- Declaration of understanding by the Proponent;
- Declaration of understanding by the Engineer;
- Declaration of understanding by the Contractor;
- Method statements; and
- ECO/ Engineer approval for method statements.

### **3-6.3.2 During development activities**

The following attached pro forma documentation are to be filled out and maintained. These are binding to the EMPr and project contract. They include *inter alia*:

- Amended Method Statements;
- ECO/ Engineer approval for amended method statements;
- Environmental incidents; and
- Records of all remediation/ rehabilitation activities.

### **3-6.4 Environmental considerations in adjudication of tender**

In terms of this EMPr, Tharisa has an obligation to ensure compliance by various parties with a suite of environmental requirements related to the construction phase. The compilation of the EMPr and its integration into the Tender document, as a suite of environmental specifications, form part of meeting the obligation, however, to ensure that these obligations continue to be fulfilling during the actual construction processes, it behoves Tharisa to ensure that the appointed Contractors possess the requisite environmental management experience and expertise. Accordingly, it would be prudent for Tharisa to ensure that environmental considerations form part of the tender adjudication process. Key considerations in this regard would be as follows:

- To request as part of the tender process that the Contractor provides his environmental policy and indicate how this will influence the way the construction process is approached and managed on site. At the tender stage the Contractor would merely be asked to provide the overarching environmental policy for the company or joint venture;
- To request as part of the tender process a list of the Contractor's previous experience in terms of the onsite implementation and management of environmental requirements;
- To request as part of the tender process an indication of the proposed organisational structure for the contract, and specifically for the Contractor to indicate which staff would be acting in the capacity of EO and which senior staff member would have overall responsibility for ensuring compliance by the Contractor with the specified environmental requirements; and
- To confirm, upon receipt of the Tender, that the Contractor has made sufficient allowance in his Tender Price for meeting the various environmental requirements.

During the tender adjudication process for each Contract, each Contractor should be scored in terms of the aforementioned considerations and allocated an environmental competency score. This score should form a key consideration in the final decision-making regarding the award of the various contracts.

## SECTION 4: COMPLIANCE TO APPENDIX 4 OF GNR. 982, AS AMENDED

An EMPr must include all sections according to Appendix 4 of GNR. 982, as amended. The following sections show compliance to the provisions under GNR. 326.

**Details of the EAP who prepared the EMPr; and the expertise of that EAP to prepare an EMPr, including a curriculum vitae.**

### 4-1.1 EAP Company: Manyabe Consultancy (Pty) Ltd

MC is a 100% black female owned entity which offers sustainable development solutions to both public and private sectors, including parastatals. The company was founded in 2014 by Managing Director, Mpho Manyabe. MC seeks to maintain its strategic position in the Environmental Management Services sector by providing service of excellence to its clients. This is achieved by providing: a professional and efficient service; the highest possible level of customer care; the highest ethical and moral principles in our actions, words and thoughts; and the highest possible level of integrity.

The objective of MC is to create an environment in which enthusiastic, highly skilled and motivated professionals seek professional opinions for contribution to the environmental, social and economic development in South Africa. MC currently has a turnover of less than R10 million rand and is a Level 1 contributor with 135% Broad Based Black Economic Empowerment (BBBEE) procurement.

**Mpho Manyabe: BSc Honours in Environmental Management, University of South Africa (UNISA), 2016; National Diploma Environmental Sciences, Tshwane University of Technology (TUT), 2008**

Mpho Manyabe currently holds a BSc Honours Degree in Environmental Management from UNISA; and National Diploma in Environmental Sciences, from TUT. She has eighteen (18) years of work experience in the field of Environmental Management from different consulting companies.

She was previously nominated to be in the Gauteng Department of Environment (GDEnv) EIA EAP committee which was launched on 31 March 2015 comprising of EAPs and GDEnv officials to provide quarterly reports to the Executive Authority (Member of the Executive Committee (MEC)) on issues identified as blockages to the improved efficiencies the department seeks to achieve.

She was also a member of the Academic Advisory Committee for the Environmental Science programme in the Department of Environmental, Water and Earth Sciences in the Faculty of Science at the TUT, to serve for a period of three (3) years, where she assisted with preparation and provision of relevant, high-quality teaching and learning content for students. She was identified, based on her expertise in the field of Environmental Sciences/ Management, to make a positive contribution to what TUT was offering students in terms of course content and on how to better run programs to the benefit of students. She is registered with South African Council for Natural Scientific Professions (SACNASP), and she is also a registered EAP with the Environmental Assessment Practitioners Association of South Africa (EAPASA). Refer to Appendix 1 for a detailed Curriculum Vitae (CV).

***She represents the Lead EAP Company on the project.***

<b>EAP Company Name:</b>	Manyabe Consultancy (Pty) Ltd
<b>Registration Number:</b>	2014/063679/07
<b>Contact Person:</b>	Mpho Manyabe
<b>Telephone Number:</b>	011 863 1079
<b>Email Address:</b>	mpho@manyabeconsultancy.com
<b>Postal Address:</b>	7682 I-Nkwaza Street, Vosloorus, 1475
<b>Physical Address:</b>	Corner Paul Smith Street and 10th Avenue , Unit 269, Block F, Ravenswood Mews, Boksburg North ,1459
<b>Qualifications and Professional Registration</b>	BSc Honours in Environmental Management National Diploma Environmental Sciences SACNASP Registered Scientist: Reg No. 117719 EAPASA Registered EAP: Reg No. 2019/700

**A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description.**

Refer to SECTION 1: for Project Description.

The actions specified by this EMPr must be enforced through the legal standing of this EMPr. To ensure compliance, it is essential that the environmental controls identified in this EMPr be translated into a suite of environmental specifications.

**A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers.**

The habitat of the project area is classified as severely modified, with extensive loss of natural species composition, vegetation structure, and ecological functioning. The entire project area consists of this habitat. The area is not connected to any surrounding natural habitats due to the surrounding existing mine and associated infrastructure and has been transformed (e.g. vegetation mowed down) to the extent that it no longer presents habitat conditions typically associated with intact or semi-natural systems. No Species of Conservation Concern (SCCs) were recorded during the assessment, and none are expected given the highly altered nature of the habitat.

No natural watercourses or wetlands were identified within the proposed project area. An off-channel process water Pollution Control Dam (PCD) is located within the 32 m Project Area of Influence (PAOI), however is not intersected by the proposed development and is in use for Tharisa Mine's stormwater management process. As such, no direct impacts on aquatic ecosystems or watercourse functionality are anticipated as a result of the proposed development.

The project has a predominantly "low" agricultural sensitivity. Furthermore, there are no active crop fields and the presence of irrigation infrastructure within the proposed BESS Development area. The project area is highly disturbed and cannot support any agricultural functions.

Refer to Figure 5 for a consolidated map which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities.

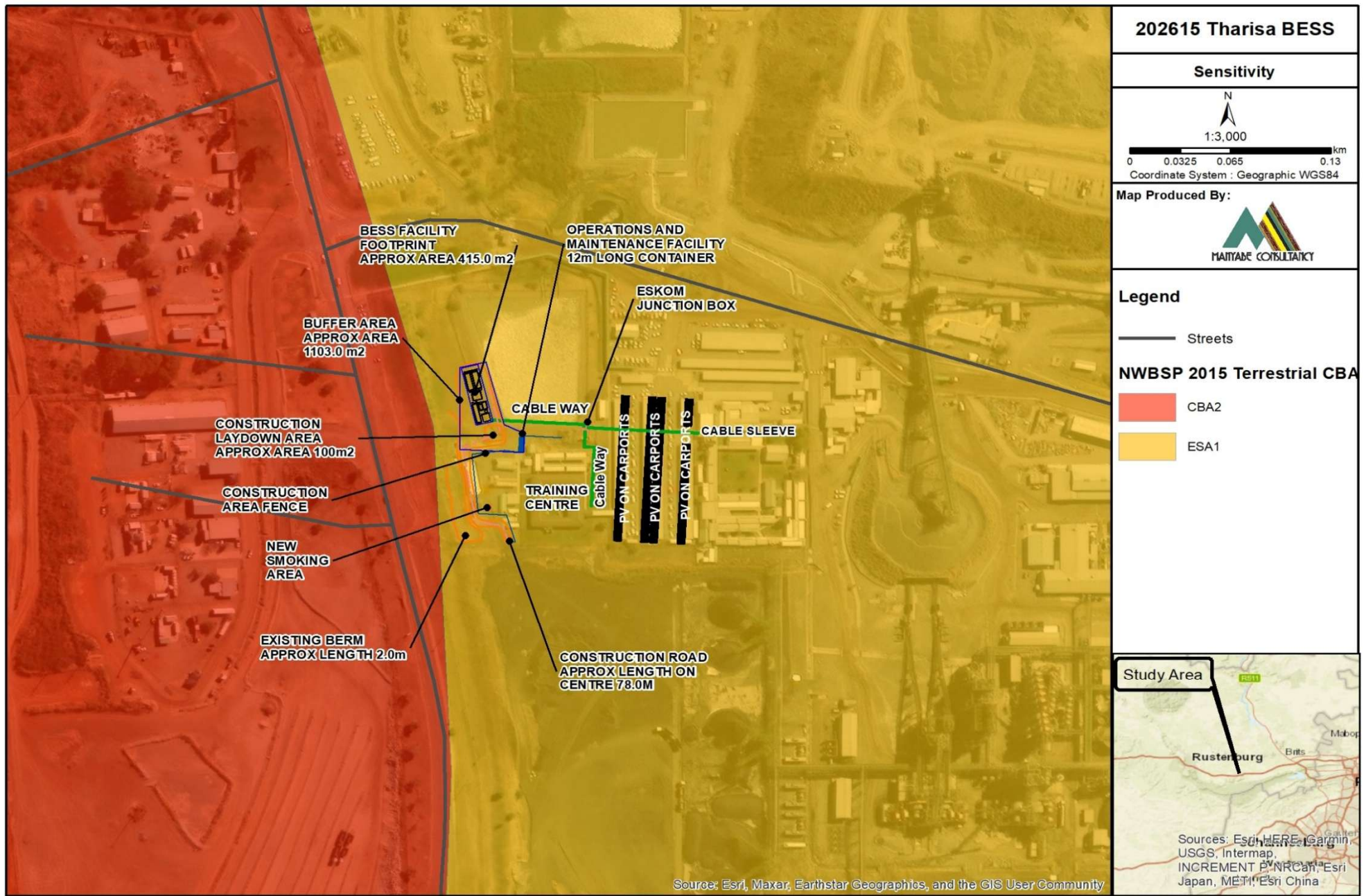


Figure 5: Map showing the proposed activity and associated infrastructure overlaid on environmental sensitivities, including avoidance areas and buffers.

## SECTION 5: IMPLEMENTATION OF EMPr

The implementation of the impact management actions and an indication of the persons who will be responsible for the implementation of the impact management actions.

This EMPr is specifically compiled for the period of time prior to commencement of, and activities associated with the construction of the proposed project activities.

### 5-1 ENVIRONMENTAL ROLES AND RESPONSIBILITIES

In order for this EMPr to be successfully implemented, all role players involved in the construction, operation and decommissioning phases need to co-operate. The role players must clearly understand their roles and responsibilities. They must also be professional, form respectful and transparent relationships and maintain open lines of communication. Role players will include, amongst others:

#### 5-1.1 Consulting Engineers (To be appointed)

Tharisa will appoint Consulting Engineers who will fulfil the role of Project Co-Coordinator/ Project Managers on behalf of Tharisa.

Consulting Engineers will be responsible and accountable for ensuring that all parties involved in the implementation of the standing EMPr are compliant. The Consulting Engineers will therefore be responsible for overall management of project and EMPr implementation. The following tasks will fall within their responsibilities:

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

The Consulting Engineers will also have ability to issue site instructions and in some instances, variation orders to the Contractor.

They will also be responsible for the appointment of an EO who will be responsible for monitoring all the Contractors' activities on site for compliance with the EMPr.

The Consulting Engineers will ensure that there is always a representative on site [Engineer Representative (RE)] who will fulfil their duties in their absence.

#### 5-1.2 Environmental Control Officer (To be appointed)

The ECO will be expected to be present on site prior to any site establishment.

The ECO will be responsible for the following:

- Conduct regular site visits to be able to report on compliance to relevant environmental legislation and respond to any environmental issues;
- Report compliance and non-compliance issues to Tharisa;
- Advise the Contractor on environmental issues within the defined work areas;
- Review access and incidents records that may pertain to the environment and reconcile the entries with the observations made during site inspection, monitoring and auditing;
- Recommend corrective action when required for aspects of noncompliance with the EMPr; and
- Take immediate action on site where clearly defined and agreed "no-go" areas are violated or in danger of being violated and to inform Tharisa of the occurrence immediately and to take action.

### **5-1.3 Contractor (To be appointed)**

The Contractor will be responsible for the overall execution of the activities during construction phase including the implementation and compliance with recommendations and conditions of the EMPr. The Contractor must therefore ensure compliance with the EMPr at all times and maintain an environmental register which keeps a record of all environmental incidents which occur on the site during construction activities. The Contractor is also responsible for the implementation of corrective actions issued by the ECO and Tharisa within a reasonable or agreed period of time.

#### **Environmental Officer**

The Contractor must appoint their own EO who is based on site in order to monitor, review and verify compliance with the EMPr. The appointed EO must:

- Familiarise himself/ herself with all relevant sections and specifications of the EMPr as well as the approved Method Statements in order to gain a full understanding of the requirements.
- Implementing all relevant EMPr sections, specifications and approved Method Statements in accordance with the requirements by Tharisa.
- Preparing and providing Environmental Method Statements (setting out in detail how the management actions contained in the EMPr will be implemented) as required by the EMPr and as per Tharisa' instructions.
- Being responsible for the Contractors' employees to ensure that all employees, suppliers or agents etc. are fully aware of the environmental requirements detailed in the environmental specifications of the EMPr.
- Notify Tharisa of any and all 'near misses', incidents, accidents and transgressions on site with respect to environmental management and non-compliance with the EMPr and approved Method Statements and seek advice for the required corrective actions and/ or site remediation.
- Recording and reporting all incidents and complaints received to Tharisa ECO.
- Liaise closely with Tharisa ECO and ensure that the works on site are conducted in an environmentally sensitive manner.
- Carry out instructions issued by Tharisa ECO required to fulfil his/ her compliance with the EMPr.

#### **Safety, Health, and Environmental Officer**

The Contractor must appoint their own Safety, Health and Environmental (SHE) Officer who is based on site

The SHE Officer is responsible for:

- Conducting health and safety audits and investigating incidents.
- Conducting safety and health awareness training and implementing a safety and health plan to all staff members.
- Monitoring the implementation of relevant safety and health legislation.
- Daily health and safety training (toolbox talks).
- Undertaking "good housekeeping" practices during construction, operation and decommissioning phases.
- Must be well vested with the health and safety emergency procedures which will ensure appropriate responses to unexpected or accidental actions or incidents.

### **5-1.4 Competent Authorities**

The authorities are responsible for overall environmental management and ensuring that the monitoring of the EMPr and other approvals is carried out. The authorities that are involved in the project are the North West Department of Agriculture and Rural Development (NWDARD).

### 5-1.5 Tharisa (the Proponent)

Tharisa is accountable for ensuring compliance to the EMPr and any other approvals, as well as good management practices requirements for the life of the project. The following role players have been appointed to act on behalf of Tharisa, in the implementation of relevant environmental legislation and requirements of the EMPr:

#### 5-1.5.1 Tharisa's representative contact details

##### **Tharisa Minerals (Pty) Ltd**

Tebogo Matsimela

Physical Address: Portion 8, Farm 342 JQ, Marikana, 0284, North West, South Africa

Postal Address: Postnet Suite 389, Private bag x75, Bryanston

Tel: +27(0) 14 572 0700

Email: [tmatsimela@tharisa.com](mailto:tmatsimela@tharisa.com)

**The method of monitoring the implementation of the impact management actions**

**The frequency of monitoring the implementation of the impact management actions**

**The time periods within which the impact management actions must be implemented**

The Contractor should ensure that his/ her employees and any third party who carries out all or part of the Contractor's obligations are adequately trained with regard to the implementation of the EMPr, as well as regarding environmental legal requirements and obligations.

Awareness training programmes should be targeted at all levels of employment.

The ECO must conduct regular audits. The audits are to verify the projects compliance with the EMPr. Monthly audits must be undertaken until the end of the construction phase.

Before any construction activities commence, the appointed independent ECO must first compile a checklist based on the contents of this EMPr and communicate it to Tharisa. The ECO must at the request of the NWDARD forward audit reports to the Department at a frequency determined by the NWDARD.

As per GNR. 326 of the EIA Regulations, 2014, as amended, Regulation 34.

(1) The holder of an environmental authorisation must, for the period during which the environmental authorisation and EMPr, and where applicable the closure plan, remain valid—

(a) ensure that the compliance with the conditions of the environmental authorisation and the EMPr, and where applicable the closure plan, is audited; and

(b) submit an environmental audit report to the relevant competent authority.

(2) The environmental audit report contemplated in subregulation (1) must—

(a) be prepared by an independent person with the relevant environmental auditing expertise;

(b) provide verifiable findings, in a structured and systematic manner, on (i) the level of performance against and compliance of an organisation or project with the provisions of the requisite environmental authorisation or EMPr and, where applicable, the closure plan; and (ii) the ability of the measures contained in the EMPr, and where applicable the closure plan, to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity;

(c) contain the information set out in Appendix 7; and

(d) be conducted and submitted to the competent authority at intervals as indicated in the environmental authorisation.

(3) The environmental audit report contemplated in subregulation (1) must determine—

(a) the ability of the EMPr, and where applicable the closure plan, to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity on an ongoing basis and to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the closure of the facility; and

(b) the level of compliance with the provisions of environmental authorisation, EMPr and where applicable, the closure plan.

(4) Where the findings of the environmental audit report contemplated in subregulation (1) indicate—

(a) insufficient mitigation of environmental impacts associated with the undertaking of the activity; or

(b) insufficient levels of compliance with the environmental authorisation or EMPr and, where applicable the closure plan; the holder must, when submitting the environmental audit report to the competent authority in terms of subregulation (1), submit recommendations to amend the EMPr or closure plan in order to rectify the shortcomings identified in the environmental audit report.

(5) When submitting recommendations in terms of subregulation (4), such recommendations must have been subjected to a public participation process, which process has been agreed to by the competent authority and was appropriate to bring the proposed amendment of the EMPr and, where applicable the closure plan, to the attention of potential and registered interested and affected parties, including organs of state which have jurisdiction in respect of any aspect of the relevant activity and the competent authority, for approval by the competent authority.

(6) Within 7 days of the date of submission of an environmental audit report to the competent authority, the holder of an environmental authorisation must notify all potential and registered interested and affected parties of the submission of that report, and make such report immediately available—

(a) to anyone on request; and

(b) on a publicly accessible website, where the holder has such a website.

(7) An environmental audit report must contain all information set out in Appendix 7 to these Regulations.

**Appendix 7 of GNR 326 provides with the objectives of the environmental audit report, and are as follows:**

(a) report on—(i) the level of compliance with the conditions of the environmental authorisation and the EMPr, and where applicable, the closure plan; and (ii) the extent to which the avoidance, management and mitigation measures provided for in the EMPr, and where applicable, the closure plan achieve the objectives and outcomes of the EMPr, and closure plan;

(b) identify and assess any new impacts and risks as a result of undertaking the activity;

(c) evaluate the effectiveness of the EMPr, and where applicable, the closure plan;

(d) identify shortcomings in the EMPr, and where applicable, the closure plan; and

(e) identify the need for any changes to the avoidance, management and mitigation measures provided for in the EMPr, and where applicable, the closure plan.

### **Content of environmental audit reports**

- (1) An environmental audit report prepared in terms of these Regulations must contain—
- (a) details of the—(i) independent person who prepared the environmental audit report; and (ii) expertise of the independent person that compiled the environmental audit report;
  - (b) a declaration that the independent auditor is independent in a form as may be specified by the competent authority;
  - (c) an indication of the scope of, and the purpose for which, the environmental audit report was prepared;
  - (d) a description of the methodology adopted in preparing the environmental audit report;
  - (e) an indication of the ability of the EMPr, and where applicable, the closure plan to— (i) sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity on an ongoing basis; (ii) sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the closure of the facility; and (iii) ensure compliance with the provisions of environmental authorisation, EMPr, and where applicable, the closure plan;
  - (f) a description of any assumptions made, and any uncertainties or gaps in knowledge;
  - (g) a description of any consultation process that was undertaken during the course of carrying out the environmental audit report;
  - (h) a summary and copies of any comments that were received during any consultation process; and
  - (i) any other information requested by the competent authority.

### **5-2 NON-COMPLIANCE**

A copy of the EMPr must be kept on site at all times during the construction periods. The EMPr will be binding on all Contractors operating on the site and must be included within the Contractual Clauses. The Contractor must comply with the environmental specifications and requirements on an ongoing basis and any failure on his part to do so will entitle the ECO to impose a penalty.

In the event of non-compliance the following recommended process must be followed:

- The ECO must issue a notice of non-compliance to the Contractor, stating the nature and magnitude of the contravention.
- The Contractor must act to correct the non-conformance within 24 hours of receipt of the notice, or within a period that may be specified within the notice.
- The Contractor must provide the ECO with a written statement describing the actions to be taken to discontinue the non-conformance, the actions taken to mitigate its effects and the expected results of the actions.
- In the case of the Contractor failing to remedy the situation within the predetermined time frame, the ECO must impose a monetary penalty based on the conditions of contract.
- In the case of non-compliance giving rise to physical environmental damage or destruction, the ECO must be entitled to undertake or to cause to be undertaken such remedial works as may be required to make good such damage and to recover from the Contractor the full costs incurred in doing so.
- In the event of a dispute, difference of opinion, etc. between any parties in regard to or arising out of interpretation of the conditions of the EMPr, disagreement regarding the implementation or method of implementation of conditions of the EMPr, etc. any party must be entitled to require that the issue be referred to specialists for determination.
- The ECO must at all times have the right to stop work and/or certain activities on site in the case of non-compliance or failure to implement remediation measures.

The Contractor is deemed not to have complied with the EMPr if:

- There is evidence of contravention of the EMPr specifications within the boundaries of the construction site, site extensions and roads.
- There is contravention of the EMPr specifications which relate to activities outside the boundaries of the construction site.
- Environmental damage ensues due to negligence.
- Construction activities take place outside the defined boundaries of the site; and/or the Contractor fails to comply with corrective or other instructions issued by the Engineer within a specific time period.

### The mechanism for monitoring compliance with the impact management actions

In terms of the Section 28 of the NEMA, *“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)”*.

The Contractors should act immediately when notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the construction site pertaining to the environment should be recorded in a dedicated register and the response noted with the date and action taken.

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

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

#### **5-2.1 Offences and penalties**

Any avoidable non-compliance with the conditions of the EMPr must be considered sufficient ground for the imposition of a penalty.

Possible offences, which should result in the issuing of a contractual penalty, include, but are not limited to:

- Unauthorised entrance into no-go areas.
- Unauthorised damage to natural vegetation.
- Unauthorised camp establishment (including stockpiling, storage, etc.).
- Hydrocarbons / hazardous material: negligent spills / leaks and insufficient storage.
- Ablution facilities: non-use, insufficient facilities, insufficient maintenance.
- Late method statements or failure to submit method statements.
- Insufficient solid waste management (including clean-up of litter, unauthorised dumping, etc.).
- Erosion due to negligence / non-performance.
- Excessive cement / concrete spillage / contamination.
- Insufficient fire control and unauthorised fires.
- Preventable damage to water courses or pollution of water bodies.
- Non-induction of staff.

### 5-2.2 Spot fines

The ECO must be authorised to impose spot fines (to the value of R100) for any of the transgressions detailed below:

- Littering on site.
- Lighting of illegal fires on site.
- Any persons, vehicles or equipment related to the Contractor's operations found within the designated "no-go" areas.
- Excess dust or excess noise emanating from site.
- Possession or use of intoxicating substances on site.
- Any vehicles being driven in excess of designated speed limits.
- Unauthorised removal and/or damage to fauna, flora or cultural or heritage objects on site.
- Urination and defecation anywhere other than using the toilet facilities that have been provided.

### 5-2.3 Penalty fines

Where environmental damage is caused or a pollution incident, and/or failure to comply with any of the environmental specifications contained in the EMPr, the Contractor must be liable to pay a penalty fine. The ECO must recommend to the Contractor the issuing of penalties for contravention of the EMPr, Environmental Authorisation, Contract, or environmental legislation.

The following transgressions must be penalised:

- Hazardous chemical/oil spill.
- Damage to sensitive environments.
- Damage to cultural and historical sites.
- Uncontrolled/unmanaged erosion.
- Unauthorised blasting activities.
- Violation of environmental authorization conditions.

### 5-2.4 Verbal instructions

Verbal instructions are likely to be the most frequently used form of corrective action and are given in response to transgressions that are evident during routine site inspections by the EO and/or ECO. Verbal instructions are also used to create further awareness amongst employees as often transgressions are a function of ignorance rather than vindictiveness. Workers must obey verbal instructions through formally recording the actions taken to resolve the matter so that the instruction could be successfully finalised and recorded. Maximum allowable response time: 2 working days.

### 5-2.5 Written instructions

Written instructions will be given following an audit. The written instructions will indicate the source or sources of the problems identified on site and propose solutions to those problems. The implementation of solutions will be assessed in a follow-up audit and further written instructions issued if required. Maximum allowable response time: 4 working days.

### 5-2.6 Provisions for addressing non-conformance

Ultimately, the key to effective environmental management during the construction phase are ensuring that the requirements of the EMPr are adequately and appropriately implemented on site. Accordingly, monitoring performance and addressing non-compliance are key attributes of any environmental interventions.

The Contractor is deemed NOT to have complied with the EMPr if:

- Within the boundaries of the site there is evidence of contravention of the EMPr confirmed and verified

by the ECO;

- Environmental damage ensues due to non-compliance of EMPr requirements;
- The Contractor fails to comply with corrective or other instructions issued by the Engineer within a specific time, and
- The Contractor fails to respond to complaints to the satisfaction of the complainant in line with requirements of this EMPr which could lead to a fine.

The cost to be incurred to rectify non-compliances must be incurred by the Contractor (“The polluter’s pays principle”).

### 5-2.7 Conclusion

This EMPr should be used as an on-site reference document during all phases of the proposed project, and auditing should take place in order to determine compliance with this EMPr. Parties responsible for environmental degradation through irresponsible behaviour/negligence should receive penalties.

In order to have records of environmental and Health & Safety incidents and the handling thereof, it is recommended that incident logs be filled in by the ECO. The applicant needs to be informed of such incidents, and further actions need to be taken, should the need arise.

## 5-3 ENVIRONMENTAL EMERGENCY PLAN

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

- Accidental discharges of polluting substances to water and land.
- Accidental exposure of employees to hazardous substances.
- Accidental fires.
- Accidental spillage of hazardous substances.
- Accidental toxic emissions into the air.
- Specific environmental and ecosystem effects from accidental releases or incidents.

These plans should include:

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

The construction camp area must be monitored for oil and fuel spills, and such spills must be cleaned and remediated to the satisfaction of the ECO. Cleaning and remediation must be done with products that are in line with best environmental practice i.e. sunsorb.

The Contractor must be in possession of an emergency spill kit that must be complete and available at all times on site. The Contractor must ensure that senior and other relevant members of the workforce are trained in dealing with spills by using emergency spill kits.

The following must apply:

- All contaminated soil/ yard stone must be removed and disposed of as hazardous waste at a registered facility or placed in containers to be taken to one central point where bioremediation can be done.
- A specialist Contractor must be used for the bioremediation of contaminated soil where the required remediation material and expertise is not available on site. All spills of hazardous substances must be reported to the EO or ECO. The Contractor must comply with the regulations of the OHSA.
- The Contractor must keep the necessary materials and equipment to deal with spills/ fire in the vicinity of the site and in an easily accessible place, should they occur.
- The Contractor must set up a procedure for dealing with spills/ fire, which will include notifying the ECO and/or Applicant the relevant authorities prior to commencing with construction. These procedures must be developed with consultation and approval of the appointed EO and ECO as applicable.
- A record must be kept of all spills and the corrective action taken.

### **5-3.1 Safety and Emergency Procedures, Risk Management and Training**

- The application of the OHSA and regulations must be ensured. This includes the distribution and use of protective clothing and equipment to at least include safety shoes, overalls, gloves, dust masks, and where appropriate ear muffs and eye/ face protection shields.
- Handout and use of safety and protective equipment must be recorded. Staff who fails to use the protective equipment provided by site staff must not be allowed to work on site.
- The Contractor's SHE Officer is to present emergency procedures during the mandatory Health and Safety Induction presented to all new site staff.
- Emergency procedures for fire, adverse conditions due to inclement weather, spillages, stoppage of operations due to refusal to work by employees, etc. must be included in the emergency procedures.
- All relevant firefighting equipment should be kept on site.
- The Site Manager must be assigned as the SHE Officer for the facility and the Site Manager must assign a person as deputy to act when appropriate.
- The Contractor must after occupation of the construction site ensure that appropriate SHE signs (symbolic safety signs) are displayed on site.
- The Contractor's employees must comply with all SHE signage posted at various locations.

The following requirements would be the minimum for the safety program:

- Orientation of new employees including safety training and emergency contingency planning.
- Accident reporting procedures for notification to the Employer and thereafter appropriate agencies.
- Thorough investigation and documentation of all accidents to ascertain the cause and future methods of preventing recurrence.
- Mandatory first aid instruction for all staff members.
- Regularly scheduled safety meetings.
- Fire prevention and firefighting instruction.
- Routine inspection and testing procedure for all safety and emergency equipment and protective devices, and routine walk through inspections conducted by the Operator through all areas to identify and correct potential unsafe conditions.
- Posting of safety bulletins and posters required by regulatory agencies and other materials concerning accident prevention and hazardous conditions.
- The Contractor must abide by all local, provincial, and national safety requirements.
- The Contractor must provide for a first aid station and emergency medical response for injured staff.
- All equipment failure must be repaired or replaced by the Contractor without any undue delay or adverse effect to the construction of the site.
- This includes all mechanical equipment and tools, safety and warning systems.
- The Operator will ensure that all equipment is maintained in a safe operating condition.

### 5-3.2 Accident and incident control and reporting

- All accidents must be recorded irrespective of the severity or seriousness of injuries and damage. Data about the accident must be provided within 24 hours after occurrence.
- Appropriate recording documents must be available on site and a person must be designated as the SHE Officer.
- Appropriate authorities and law enforcement officers must be included in investigations into accidents.
- Steps to avoid recurrence of similar accidents must be identified and implemented. The steps must be recorded and monitored.
- Incidents must be recorded in an incident register noting the time, date and place where the incident occurred, who and what was involved, and a detailed description of the incident must be included in the report.
- Actions taken to address the occurrence of the incident, as well as the avoidance of recurrence of the incident must be recorded.

### 5-3.3 Chemical Fuel Spill

- The site must have a supply of absorbent material readily available to absorb any emergency hydrocarbon (fuel / oil) spills, and where possible be designed to encapsulate minor hydrocarbon spillage. The quantity of such materials must be able to absorb/ deal with a minimum of 200 l of hydrocarbon liquid spill.
- The source of the spill must be isolated, and the spillage contained.
- The area should be cordoned off and secured.
- Treatment and remediation of spill areas must be undertaken to the satisfaction of the Contractor and the ECO.
- Material stockpiles and equipment are to be kept outside of potential flood zones after heavy rains.

### 5-3.4 Emergency Contact Details

This EMPr has made provisions for some of the Emergency Numbers within the development area:

Ambulance:	014 597 6612
South African Police Service:	014 572 3100/ 43
Fire Service:	014 590 3333/ 3444/ 3232
Nearest Hospital: Peglerae Hospital (Casualties):	014 597 2823
Rustenburg Local Municipality:	014 590 3111
Bojanala District Municipality:	014 590 4500

**A program for reporting on compliance, taking into account the requirements as prescribed by EIA Regulations, 2014, as amended**

### 5-3.5 The Administration

Before the Contractor begins the construction activities, the Contractor should give to the ECO a written method statement setting out the following:

- The type of construction activities.
- Locality where the activity will take place.
- Identification of impacts that might result from the activity.
- Identification of activities that may cause an impact.
- Methodology and/or specifications for impact prevention for each activity or aspect.
- Methodology and/or specifications for impact containment for each activity or aspect.
- Emergency/disaster incident and reaction procedures.

- Treatment and continued maintenance of impacted environment.

The Contractor may provide such information in advance of any or all construction activities provided that new submissions are given to the ECO whenever there is a change or variation to the original.

The ECO may provide comment on the methodology and procedures proposed by the Contractor, but he will not be responsible for the Contractor's chosen measures of impact mitigation and emergency/disaster management systems.

### **5-3.6 House Keeping**

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

### **5-3.7 Record Keeping**

The ECO will continuously monitor the Contractor's adherence to the approved impact prevention procedures, and the ECO should issue to the Contractor a notice of non-compliance whenever transgressions are observed. The ECO should document the nature and magnitude of the non-compliance in a designated register, the action taken to discontinue the non-compliance, the action taken to mitigate its effects and the results of the actions. The non-compliance should be documented and reported to Tharisa in a monthly report.

### **5-3.8 Document Control**

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

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

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

**An environmental awareness plan describing the manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work; and risks must be dealt with in order to avoid pollution or the degradation of the environment.**

## **5-4 ENVIRONMENTAL AWARENESS PLAN**

This EMPr has been compiled in accordance with Section 24N of NEMA. Its purpose is to monitor and ensure compliance during the pre-construction, construction, operational and decommissioning phases of the proposed project. It provides recommendations and guidelines to minimise potential environmental impacts throughout the project lifecycle and must remain available on site as a compliance monitoring document for the duration of the proposed BESS Development. As a legally binding document, the EMPr requires Tharisa to implement all prescribed mitigation measures to prevent anticipated environmental impacts.

The EMPr also defines the roles and responsibilities of the persons and parties responsible for implementation across all project phases. The appointed parties identified in Section 5-1 will be responsible for monitoring compliance and ensuring that all prescribed mitigation measures are implemented.

Tharisa must maintain its commitment to environmental protection by complying with all applicable legislation and ensuring that its activities do not pose risks to the environment or neighbouring communities. Tharisa must also continue engaging with the Competent Authorities to confirm that all prescribed measures meet the required standards.

Contractors should ensure that its employees and any third party who carries out all or part of the Contractor's obligations are adequately trained with regard to the implementation of the EMPr, as well as regarding environmental legal requirements and obligations.

An ECO may be contracted to provide training and to ensure that records of all training interventions are kept in accordance with the record keeping and documentation control requirements as set out in this EMPr.

The environmental training should, as a minimum, include the following:

- Environmental legal requirements and obligations.
- The importance of conformance with all environmental policies.
- The environmental impacts, actual or potential, of their work activities.
- The environmental benefits of improved personal performance.
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures, including emergency preparedness and response requirements.
- The potential consequences of departure from specified operating procedures.
- The mitigation measures required to be implemented when carrying out their work activities.
- The importance of not littering.
- The importance of using supplied toilet facilities.
- The need to use water sparingly.
- Details of and encouragement to minimise the production of waste and re-use, recover and recycle waste where possible.
- Details regarding archaeological and/or historical sites which may be unearthed during construction and the procedures to be followed should these be encountered.

The EO will be responsible for ensuring that everyone on site is given an environmental awareness induction which outlines the requirements of the EMPr as a management tool to protect the environment.

## SECTION 6: ENVIRONMENTAL MANAGEMENT PROGRAMME MITIGATION MEASURES

The point of departure for this EMPr is to ensure a pro-active rather than re-active approach to environmental performance by addressing potential problems before they occur. This will limit corrective measures needed during the pre-construction, construction, operational and decommissioning phases of the proposed project. Therefore, the purpose of an EMPr is to provide management measures that must be implemented by the Proponent, Engineers and Contractors to ensure that the potential impacts of the proposed development are minimised. It must also be ensured that the EMPr is maintained and upheld as a dynamic document in order for the project team to add or improve on issues that might be considered left out or not relevant to the project.

The Contractor will familiarise himself with the site and development layout and will ensure that all exclusion zones are demarcated with hazard tape before construction activities commence. All employees and subcontractors will be briefed in this regard, and no access will be allowed into these exclusion areas without the written permission of the ECO.

In order to minimise adverse impacts to the sensitive areas during construction activities, these sensitive areas may not be entered or used for any other purpose other than the activities proposed, unless a written motivation has been submitted to the ECO by the responsible person and a written approval has been received from the ECO.

With respect to the proposed development site, the habitat of the project area is classified as severely modified, with extensive loss of natural species composition, vegetation structure, and ecological functioning. The entire project area consists of this habitat. The area is not connected to any surrounding natural habitats due to the surrounding existing mine and associated infrastructure and has been transformed (e.g. vegetation mowed down) to the extent that it no longer presents habitat conditions typically associated with intact or semi-natural systems. No SCCs were recorded during the assessment, and none are expected given the highly altered nature of the habitat.

No natural watercourses or wetlands were identified within the proposed project area. An off-channel process water PCD is located within the 32 m PAOI, however is not intersected by the proposed development and is in use for Tharisa Mine's stormwater management process. As such, no direct impacts on aquatic ecosystems or watercourse functionality are anticipated as a result of the proposed development.

The project has a predominantly "low" agricultural sensitivity. Furthermore, there are no active crop fields and the presence of irrigation infrastructure within the proposed BESS area. The project area is highly disturbed and cannot support any agricultural functions.

Refer to Figure 5 for a consolidated map which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities. This EMPr is informed by the Site Sensitivity Verification Report (SSVR), which confirmed low sensitivity across all themes, therefore mitigation measures are proportionate to low-risk conditions.

The sections below form the core mitigation measures appropriate to the pre-construction, pre-construction, construction, operational and decommissioning phases.

### 6-1 ENVIRONMENTAL MANAGEMENT PROGRAMME

The construction process will follow industry standard methods and techniques. Key activities associated with the **construction phase** are described in Table 4 below.

**Table 4: Construction Activities**

Activity	Description
Establishment of a construction access road	A short internal construction access road will be required for the proposed site development. This road will provide access to the BESS Development.

Activity	Description
Site preparation and establishment	Site establishment will include vegetation clearing, any required bulk earthworks, and the installation of access control fencing.
Establishment of a laydown area on site	Construction materials, machinery, and equipment will be stored in designated laydown and/or storage areas. The use of a centralised laydown area will reduce potential environmental impacts during the construction phase by confining activities to a single, controlled location.
Transport of components and equipment to site	All construction materials, machinery, and equipment (e.g. graders, excavators, trucks, cement mixers) will be transported to the site using the national, regional, and local road network. Larger components may be classified as abnormal loads in terms of the National Road Traffic Act, 1996 (Act No. 93 of 1996). In such cases, the necessary permits will be obtained for the transportation of these loads on public roads.
Installation of battery system and cables	<p>Foundations will be constructed, and the BESS Development will be installed. 400V cables will be installed underground to connect the BESS Development to the Eskom junction box, with cable racking utilised where feasible. Trenching depths will range from 600 mm in pedestrian areas to 1,000 mm at road crossings, with a minimum trench width of 450 mm. Trenches will be prepared with a level, debris-free base and a 75 mm layer of sand bedding.</p> <p>Cables will be laid without tension on the prepared bedding, ensuring appropriate spacing and identification. Protective measures will include sand cover, mechanical protection barriers, and warning tape installed 250 to 300mm below ground level. Backfilling will be carried out using suitable material, compacted in layers. Road crossings will be constructed using ducts or concrete encasement. Minimum separation distances between services will be maintained, and markers will be installed at regular intervals and at key points.</p> <p>All installations will be tested and commissioned in accordance with relevant South African National Standards (SANS) and NRS standards, and appropriate safety controls will be implemented throughout.</p>
Rehabilitation	Once all construction is completed on site and all equipment and machinery have been removed from the site, the site will be rehabilitated.

During the **operational phase**, key activities will include routine inspection and maintenance.

The **decommissioning phase** will include activities similar to that of the construction phase as indicated in Table 4.

Following are the proposed management or mitigation measures (refer to Table 5) which will be considered and taken to address the environmental impacts which have been identified thus far during **pre-construction, construction, operational and decommissioning phases**:

The following mitigation measures will be implemented throughout the life of the project:

**Table 5: Potential Impacts and Mitigation Measures**

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
<b>PRE-CONSTRUCTION</b>			
Legal and Policy Compliance	<ul style="list-style-type: none"> <li>The development must comply with relevant legislation (municipal by-laws etc.).</li> <li></li> </ul>	<ul style="list-style-type: none"> <li>Conduct environmental induction training for all personnel and contractors before commencement of work.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Environmental Awareness Training	<ul style="list-style-type: none"> <li>Environmental non-compliance due to lack of awareness.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct environmental induction training for all personnel and contractors before commencement of work.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Construction Site Establishment	<ul style="list-style-type: none"> <li>Unnecessary disturbance of land, vegetation, and sensitive areas.</li> </ul>	<ul style="list-style-type: none"> <li>Demarcate site boundaries and approved work areas prior to construction.</li> <li>Fencing will be installed around the entire BESS Development, including the access road, to restrict unauthorised entry.</li> <li>Fencing shall be kept neat at all times, so as not to cause any unnecessary visual influence. The Contractor shall be responsible for the maintenance of all fences.</li> <li>If temporary fencing is removed temporarily for the execution of work, the Contractor shall reinstate it as soon as practicable.</li> <li>Breaches in the fencing must be repaired immediately.</li> <li>The purpose of the fenced areas is to control construction and personnel activities within the designated areas, and to contain construction camp activities.</li> <li>Fencing shall be established and maintained until construction activities are finished.</li> <li>No clearing or grubbing shall be allowed outside fenced areas to reduce the footprint of the development.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Access restricted areas and areas where no development is permitted	<ul style="list-style-type: none"> <li>Disturbance or destruction of environmentally sensitive areas.</li> </ul>	<ul style="list-style-type: none"> <li>Identify and demarcate environmentally sensitive areas and no-go zones.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Access Roads	<ul style="list-style-type: none"> <li>Soil erosion, dust generation, vegetation loss, and habitat fragmentation.</li> </ul>	<ul style="list-style-type: none"> <li>Utilise existing roads where possible and plan routes to minimise disturbance.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Fencing and Gate Installations	<ul style="list-style-type: none"> <li>Disturbance of vegetation and fauna movement.</li> </ul>	<ul style="list-style-type: none"> <li>Design fencing to minimise environmental impacts.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Water Supply Management	<ul style="list-style-type: none"> <li>Excessive water consumption and depletion of local water resources.</li> </ul>	<ul style="list-style-type: none"> <li>Secure lawful water supply sources and authorisations where required.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Stormwater and Wastewater Management	<ul style="list-style-type: none"> <li>Pollution of soil, surface water, and</li> </ul>	<ul style="list-style-type: none"> <li>Develop a Stormwater Management Plan (SWMP).</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
Solid Waste Management	<p>groundwater.</p> <ul style="list-style-type: none"> <li>Littering, pollution, attraction of vermin, and visual degradation.</li> </ul>	<ul style="list-style-type: none"> <li>Rubble material will be removed from the construction site frequently and disposed of at a registered waste disposal site.</li> <li>Sufficient containers will be available on the construction site to handle the amount of litter, wastes, rubbish, debris and builders' wastes generated on site.</li> <li>These containers will be emptied frequently to avoid rodents, insects or any other organisms accumulating on the site and becoming a health hazard to adjacent properties.</li> <li>No waste will remain on the construction site for more than two (2) weeks.</li> <li>Waste shall be separated into recyclable and non-recyclable waste, and shall be separated as follows: <ul style="list-style-type: none"> <li>Hazardous waste – including (but not limited to) old oil and paint.</li> <li>General waste - including (but not limited to) construction rubble, reusable construction material.</li> <li>Recyclable waste shall preferably be deposited in separate bins. The Contractor is advised to make use of "Collect-a-Can" for the collection of tins, including paint and chemical tins, and "Consol" for the collection of glass for recycling.</li> </ul> </li> <li>Any illegal dumping of waste will not be tolerated. This action will result in a fine and if required further legal action will be taken. This aspect will be closely monitored and reported on.</li> <li>Proof of legal dumping must be able to be produced on request.</li> <li>Bins must be clearly marked for ease of management. All refuse bins must have a lid secured so that animals cannot gain access.</li> <li>Sufficient closed containers must be strategically located around the construction site to handle the amount of litter, waste, rubbish, debris and builders waste generated on the site.</li> <li>Subcontractors must contain a clause to the effect that the disposal of all construction-generated refuse/ waste to an officially approved waste disposal site is the responsibility of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMPr.</li> <li>Proof of this undertaking must be issued to the ECO. All solid and chemical wastes that are generated must be removed and disposed of at a licensed waste disposal site. The Contractor is to provide proof of such to the ECO.</li> <li>Chemical containers and packaging brought onto the site must be removed for disposal at a suitable site.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
Protection of Natural Water Channels and Water Bodies	<ul style="list-style-type: none"> <li>Sedimentation, contamination, and alteration of natural drainage patterns.</li> </ul>	<ul style="list-style-type: none"> <li>Identify and demarcate watercourses and buffer areas.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Vegetation Clearance	<ul style="list-style-type: none"> <li>Loss of vegetation, habitat destruction, and increased erosion.</li> </ul>	<ul style="list-style-type: none"> <li>The topsoil is regarded as the top 100 mm of the soil profile irrespective of the fertility appearance. Topsoil is to be stripped when it is in a dry condition in order to prevent compaction.</li> <li>The topsoil, including the existing grass cover is to be shallowly ripped (only the depth of the topsoil) before removal. This is to ensure that organic plant material, and the natural seed base is included in the stripping process.</li> <li>Should archaeologically finds of any nature including fossils, bones or remains of structures be found, the Contractor will stop all construction activities in the area. The Contractor will not move or remove anything from the area and will notify the ECO. The ECO will contact the South African Heritage Resources Agency (SAHRA) for further investigation and clarification. Although all possible care has been taken to identify sites of cultural importance during the field assessment, it is always possible that hidden or subsurface heritage remains could be overlooked. Should any evidence of archaeological sites or remains (e.g. remnants of stone-built structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils, burials, or other categories of heritage resources be uncovered, work must cease in the vicinity of the find and SAHRA must be alerted immediately to determine an appropriate way forward.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Protection of Fauna and Flora	<ul style="list-style-type: none"> <li>Injury, displacement, or mortality of fauna and destruction of sensitive plant species.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct pre-construction surveys where required and identify sensitive species.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Protection of Heritage Resources	<ul style="list-style-type: none"> <li>Damage to archaeological, cultural, or historical resources.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct heritage walkdowns where required and identify heritage-sensitive areas.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Safety of the Public	<ul style="list-style-type: none"> <li>Injury to members of the public from construction activities and equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Inform surrounding communities of planned activities.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Sanitation	<ul style="list-style-type: none"> <li>Soil and water contamination from inadequate sanitation facilities.</li> </ul>	<ul style="list-style-type: none"> <li>Adequate chemical latrines shall be provided for all staff at the construction camp and along the rest of the site where construction activities may take place.</li> <li>They shall be serviced once a week to prevent spillages.</li> <li>All latrine accommodation provided by the Contractor shall be efficient, sanitary and non-offensive.</li> <li>All sanitary fees payable to any local authority shall be paid by</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
Prevention of Diseases	<ul style="list-style-type: none"> <li>Spread of communicable diseases among workers and communities.</li> </ul>	<p>the Contractor.</p> <ul style="list-style-type: none"> <li>Educate workers on disease prevention and hygiene practices.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Emergency Procedures	<ul style="list-style-type: none"> <li>Delayed response to accidents, fires, or spills resulting in environmental damage.</li> </ul>	<ul style="list-style-type: none"> <li>Develop emergency preparedness and response plans.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Hazardous Substances Management	<ul style="list-style-type: none"> <li>Soil and water contamination from spills or leaks.</li> </ul>	<ul style="list-style-type: none"> <li>Identify hazardous substances and prepare storage procedures.</li> <li>The Contractor shall provide and maintain bund walls around the fuel storage areas within the site. Such walls shall be of sufficient height to contain 110% of the capacity of the fuel storage facilities.</li> <li>Storage of fuel shall only be above the ground.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Workshop, Equipment Maintenance and Storage	<ul style="list-style-type: none"> <li>Hydrocarbon contamination of soil and water resources.</li> </ul>	<ul style="list-style-type: none"> <li>Designate maintenance and storage areas.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Batching Plants (if applicable)	<ul style="list-style-type: none"> <li>Dust emissions, wastewater generation, and noise pollution.</li> </ul>	<ul style="list-style-type: none"> <li>Concrete shall only be mixed in areas, which have been specifically demarcated for those purposes.</li> <li>All concrete spilt shall be promptly removed by the Contractor to an approved disposal site.</li> <li>After mixing is complete, all waste shall be removed from the batching area and disposed of at an approved disposal site.</li> <li>No storm water is permitted to flow through the batching site.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Dust Emissions	<ul style="list-style-type: none"> <li>Reduced air quality, nuisance to neighbouring receptors, and vegetation impacts.</li> </ul>	<ul style="list-style-type: none"> <li>Dust dispersion from construction activities shall be limited and suppressed to the maximum extent practical. The liberation of dust into the surrounding environment shall be effectively controlled by the use of, <i>inter alia</i>, water spraying and/or other dust-allaying agents.</li> <li>Regular dust monitoring and reporting to be undertaken.</li> <li>Dust control must be implemented by wetting all bare surfaces with a water bowser.</li> <li>Water must be sourced from a registered water source.</li> <li>The Contractor must wet down all bare surfaces at least once per day and in windy, dry conditions, more than once where necessary.</li> <li>Care must be taken not to over-water the areas and cause erosion and structural damage to the soil.</li> <li>Topsoil stockpiles should be seeded with a grass mix to protect the soil from blowing away if the stockpile will not be used within 3 months.</li> <li>Other stockpiles should be wetted down if they are prone to dust blowing off these items. Where spraying of water on stockpiles is</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
		<p>not adequate for dust control, environmentally benign binding agents shall be used to limit wind-blown dust.</p> <ul style="list-style-type: none"> <li>The speed of construction vehicles must be strictly controlled to avoid dangerous conditions, excessive dust or excessive deterioration of the road being used.</li> <li>Construction vehicles to be covered when transporting construction materials from and to the site.</li> </ul>	
Noise Management	<ul style="list-style-type: none"> <li>Disturbance to surrounding communities and fauna.</li> </ul>	<ul style="list-style-type: none"> <li>Notify affected parties of anticipated construction activities.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Visual Impact	<ul style="list-style-type: none"> <li>Degradation of landscape character and visual intrusion.</li> </ul>	<ul style="list-style-type: none"> <li>Position infrastructure to minimise visual intrusion where feasible.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Fire Prevention	<ul style="list-style-type: none"> <li>Injury, loss of property, and destruction of vegetation and habitat.</li> </ul>	<ul style="list-style-type: none"> <li>Develop a fire management plan and provide firefighting equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Stockpiling and Stockpile Areas	<ul style="list-style-type: none"> <li>Dust generation, erosion, and sedimentation of nearby watercourses.</li> </ul>	<ul style="list-style-type: none"> <li>Soil stockpiles shall not be higher than 2.5m or stored for a period longer than one year. The slopes of soil stockpiles shall not be steeper than 1 vertical to 2.5 horizontal.</li> <li>No vehicles shall be allowed access onto the stockpiles after they have been placed.</li> <li>Stockpiles shall not be allowed to become contaminated with oil, diesel, petrol, garbage or any other material, which may inhibit the later growth of vegetation.</li> <li>The Contractor shall apply soil conservation measures to the stockpiles to prevent erosion. This can include the use of erosion control fabric or grass seeding and bunding.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Excavation of Foundations, Cable Trenches and Drainage Systems	<ul style="list-style-type: none"> <li>Soil erosion, dust generation, and disturbance of vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>Survey and demarcate excavation areas.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Installation of Foundations, Cable Trenches and Drainage Systems	<ul style="list-style-type: none"> <li>Soil contamination, habitat disturbance, and waste generation.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure designs minimise environmental impacts.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Installation of Equipment	<ul style="list-style-type: none"> <li>Disturbance of land and risk of accidental spills.</li> </ul>	<ul style="list-style-type: none"> <li>Plan delivery and installation activities to minimise impacts.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Socio-Economic Benefits and Impacts	<ul style="list-style-type: none"> <li>Community conflict, unrealistic employment expectations, or social disruption.</li> </ul>	<ul style="list-style-type: none"> <li>Prioritise local employment and procurement opportunities where feasible.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Temporary Site Closure	<ul style="list-style-type: none"> <li>Environmental degradation due to unattended infrastructure and erosion.</li> </ul>	<ul style="list-style-type: none"> <li>Develop temporary closure procedures.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
Landscaping and Rehabilitation	<ul style="list-style-type: none"> <li>Failure to restore ecological function and visual quality of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Develop a rehabilitation plan and identify suitable indigenous species.</li> </ul>	<ul style="list-style-type: none"> <li>Engineer/ Contractor/ EO</li> </ul>
<b>CONSTRUCTION PHASE</b>			

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
Environmental Awareness Training	<ul style="list-style-type: none"> <li>Environmental non-compliance due to lack of awareness.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct environmental induction training for all personnel and contractors before commencement of work.</li> <li>Refresher training and toolbox talks to be conducted regularly.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Construction Site Establishment	<ul style="list-style-type: none"> <li>Unnecessary disturbance of land, vegetation, and sensitive areas.</li> </ul>	<ul style="list-style-type: none"> <li>Restrict activities to designated areas and minimise disturbance footprint.</li> <li>Fencing will be installed around the entire BESS Development, including the access road, to restrict unauthorised entry.</li> <li>Fencing shall be kept neat at all times, so as not to cause any unnecessary visual influence. The Contractor shall be responsible for the maintenance of all fences.</li> <li>If temporary fencing is removed temporarily for the execution of work, the Contractor shall reinstate it as soon as practicable.</li> <li>Breaches in the fencing must be repaired immediately.</li> <li>The purpose of the fenced areas is to control construction and personnel activities within the designated areas, and to contain construction camp activities.</li> <li>Fencing shall be established and maintained until construction activities are finished.</li> <li>No clearing or grubbing shall be allowed outside fenced areas to reduce the footprint of the development.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Eating Areas and Camp	<ul style="list-style-type: none"> <li>Littering and pollution.</li> <li>Influx of vermin and flies.</li> </ul>	<ul style="list-style-type: none"> <li>The Contractors must provide and maintain a method statement for “construction lay down areas”.</li> <li>The Contractor must, in conjunction with the EO, designate restricted eating areas for eating during normal working hours. Adequate closed refuse bins must be provided and cleaned on a daily basis.</li> <li>No fires are to be lit outside of a facility designed to contain fires. The adequacy and positioning of these structures must be determined in consultation with the EO.</li> <li>The feeding, or leaving of food, for stray or other animals in the area is strictly prohibited.</li> <li>Camp followers/ informal traders must not be allowed to congregate outside the construction site.</li> <li>Litter (even if originating outside the camp but within the site boundary) and concrete bags, etc. must be picked up daily and put into suitably closed bins.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored on a daily basis by the Contractor EO. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
Access restricted areas and areas where no development is permitted	<ul style="list-style-type: none"> <li>Disturbance or destruction of environmentally sensitive areas.</li> </ul>	<ul style="list-style-type: none"> <li>Identify and demarcate environmentally sensitive areas and no-go zones.</li> <li>Prevent access to restricted areas through signage and barriers.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Access Roads	<ul style="list-style-type: none"> <li>Soil erosion, dust generation, vegetation loss, and habitat fragmentation.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain roads, control erosion and suppress dust.</li> <li>Utilise existing roads where possible and plan routes to minimise disturbance.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Fencing and Gate Installations	<ul style="list-style-type: none"> <li>Disturbance of vegetation and fauna movement.</li> </ul>	<ul style="list-style-type: none"> <li>Install fencing within approved areas only.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Water Supply Management	<ul style="list-style-type: none"> <li>Excessive water consumption and depletion of local water resources.</li> </ul>	<ul style="list-style-type: none"> <li>Use water efficiently and repair leaks immediately.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Stormwater and Wastewater Management	<ul style="list-style-type: none"> <li>Pollution of soil, surface water, and groundwater.</li> </ul>	<ul style="list-style-type: none"> <li>Separate clean and dirty water systems and prevent contamination.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Solid Waste Management	<ul style="list-style-type: none"> <li>Littering, pollution, attraction of vermin, and visual degradation.</li> </ul>	<ul style="list-style-type: none"> <li>The Contractors must provide and maintain a method statement for "solid waste management". The method statement must provide information on licensed facility to be utilised and details of proposed record keeping for auditing purposes.</li> <li>Waste must be separated into recyclable and non-recyclable waste.</li> <li>Any illegal dumping of waste must not be tolerated. This action will result in a fine and if required further legal action will be taken. This aspect must be closely monitored and reported on; proof of legal dumping must be able to be produced on request.</li> <li>Bins must be clearly marked for ease of management.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored on a daily basis by the Contractor EO. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
		<ul style="list-style-type: none"> <li>All refuse bins must have a secured lid so that animals cannot gain access.</li> <li>Sufficient closed containers must be strategically located around the construction site to handle the amount of litter, wastes, rubbish, debris, and builder's wastes generated on the site.</li> <li>All solid wastes, including chemical wastes that are generated must be removed and disposed of at a licensed waste disposal site. The Contractor is to provide proof of such to the EO and ECO.</li> <li>Chemical containers and packaging brought onto the site must be removed for disposal at a suitable site.</li> <li>A skip, with a cover, must be used to contain refuse from campsite bins, rubble and other construction material.</li> </ul>	
Protection of Natural Water Channels and Water Bodies	<ul style="list-style-type: none"> <li>Sedimentation, contamination, and alteration of natural drainage patterns.</li> </ul>	<ul style="list-style-type: none"> <li>Prohibit construction activities within designated buffer zones and prevent pollution.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Vegetation Clearance	<ul style="list-style-type: none"> <li>Loss of vegetation, habitat destruction, and increased erosion.</li> </ul>	<ul style="list-style-type: none"> <li>Minimise vegetation removal and avoid unnecessary disturbance.</li> <li>Limit clearing to approved footprint and clearly demarcate areas.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Protection of Fauna and Flora	<ul style="list-style-type: none"> <li>Injury, displacement, or mortality of fauna and destruction of sensitive plant species.</li> </ul>	<ul style="list-style-type: none"> <li>Prohibit hunting, trapping and collection of plants. Relocate fauna where necessary.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Protection of Heritage Resources	<ul style="list-style-type: none"> <li>Damage to archaeological, cultural, or historical resources.</li> </ul>	<ul style="list-style-type: none"> <li>Stop work immediately if heritage resources are discovered and notify relevant authorities.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Safety of the Public	<ul style="list-style-type: none"> <li>Injury to members of the public from construction activities and equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Inform surrounding communities of planned activities.</li> <li>Secure construction areas, erect warning signage and restrict public access.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
Sanitation	<ul style="list-style-type: none"> <li>Soil and water contamination from inadequate sanitation facilities.</li> <li>Potential of spreading diseases on site.</li> </ul>	<ul style="list-style-type: none"> <li>The Contractor is responsible for providing all sanitary arrangements for his/ her team. A minimum of one chemical toilet must be provided per 15 persons.</li> <li>Sanitary arrangements must be to the satisfaction of the ECO. Toilets must be of the chemical type. The Contractor must keep the toilets in a clean, neat and hygienic condition. The Contractor must supply toilet paper at all toilets at all times. Toilet paper dispensers must be provided in all toilets.</li> <li>Toilets provided by the Contractor must be easily accessible. All toilets will be located within the Contractor's camp. Should toilets be needed elsewhere, their location must first be approved by the EO or ECO.</li> <li>The Contractor (who must use reputable toilet-servicing company) must be responsible for the cleaning, maintenance and servicing of the toilets. The Contractor (using reputable toilet-servicing company) must ensure that all toilets are cleaned and emptied before the builders' or other public holidays.</li> <li>Toilets out on site must be secured to the ground and have a sufficient locking mechanism operational at all times.</li> <li>Ensure proper sanitation is achieved which will encourage the workforce to utilise toilets provided and not the surrounding habitat.</li> </ul>	<p>are being properly implemented. The EO must conduct daily audits.</p> <ul style="list-style-type: none"> <li>Mitigation measures to be monitored on a daily basis by the Contractor EO. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Prevention of Diseases	<ul style="list-style-type: none"> <li>Spread of communicable diseases among workers and communities.</li> </ul>	<ul style="list-style-type: none"> <li>Educate workers on disease prevention and hygiene practices.</li> <li>Maintain sanitary conditions and manage waste effectively.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Emergency Procedures	<ul style="list-style-type: none"> <li>Delayed response to accidents, fires, or spills resulting in environmental damage.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain emergency equipment and conduct drills.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Hazardous Substances Management	<ul style="list-style-type: none"> <li>Soil and water contamination from spills or leaks.</li> </ul>	<ul style="list-style-type: none"> <li>Properly store and handle hazardous materials (fuels, oils, chemicals) to prevent spills.</li> <li>Dispose of waste materials properly and prevent littering on site.</li> <li>Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in caged areas or under lock and key, as</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored on a daily basis by the Contractor EO. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
		<p>appropriate, in well-ventilated areas.</p> <ul style="list-style-type: none"> <li>• Storage areas must display the required safety signs depicting “no smoking”, “No naked lights” and “Danger”. Containers must be clearly marked to indicate contents as well as safety requirements.</li> <li>• The Contractor must supply a method statement for the storage of hazardous materials at tender stage.</li> <li>• All pollutants on site, including waste materials and construction debris shall be handled and disposed of in a manner that does not cause contamination of stormwater runoff by, e.g. bunding storage areas that contain hazardous substances, etc.</li> <li>• Good housekeeping practices shall be employed to prevent contamination of stormwater runoff.</li> <li>• These substances must be confined to specific and secured areas, and in a way that does not pose a danger of pollution even during times of high rainfall.</li> <li>• These areas must be imperviously bunded with adequate containment (at least 1.5 times the volume of the fuel) for potential spills or leaks.</li> <li>• Drip trays (minimum of 10cm deep) must be placed under all vehicles that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended, drip trays must be utilised.</li> <li>• The depth of the drip tray must be determined considering the total amount/ volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle.</li> <li>• Spill kits must be available on site and in all vehicles that transport hydrocarbons.</li> <li>• All spilled hazardous substances must be contained in impermeable containers for removal to a licensed hazardous waste site, (this includes contaminated soils, and drenched spill kit material).</li> </ul>	<p>conduct daily audits.</p>
Workshop, Equipment Maintenance and Storage	<ul style="list-style-type: none"> <li>• Hydrocarbon contamination of soil and water resources.</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct maintenance in designated areas with spill containment measures.</li> <li>• Heavy vehicles delivering construction materials will only be allowed onto the site if they are maintained properly.</li> <li>• The heavy vehicles shall be kept to a limited number.</li> <li>• Drivers of these delivery vehicles shall be educated on their environmental responsibility.</li> <li>• All materials shall be stored in areas earmarked for storage or other construction activities in order to reduce the footprint of the construction activities.</li> </ul>	<ul style="list-style-type: none"> <li>• Mitigation measures to be monitored on a daily basis by the Contractor EO. The EO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
		<ul style="list-style-type: none"> <li>• Oil, paint and chemicals that are kept in smaller containers must be kept in a locked room such as the site office with a sign-out register and records of quantities kept ensuring no losses occur.</li> <li>• Bulk fuel storage tanks on the site shall be on an impervious surface with an appropriate bunding and be able to contain at least 110% of the volume of the tanks.</li> <li>• Bulk fuel storage tanks shall be located such that they do not pose a high risk in terms of water pollution.</li> <li>• Bulk fuel storage tanks shall be placed so that they are out of the way of traffic, so that the risk of the tanks being ruptured or damaged by vehicles is minimised.</li> <li>• All maintenance and washing of vehicles and equipment must take place in an area that is equipped with a bund wall and grease trap oil separator. During servicing of vehicles/equipment, a suitable drip tray must be used, especially where emergency repairs are done outside the workshop/ camp laydown area. Leaking equipment must be repaired immediately/ be removed from site to facilitate repair. All wastes must be collected and removed to an appropriate registered waste site.</li> <li>• Workshop areas must be monitored for oil and fuel spills, and such spills must be cleaned and remediated to the satisfaction of the EO. Cleaning and remediation must be done with products that are in line with best environmental practice i.e. sunsorb.</li> <li>• A method statement is required from the Contractor, tendering for the project to show procedures for dealing with possible emergencies that can occur, such as fire, accidental leaks and spillage.</li> <li>• The Contractor must be in possession of an emergency spill kit that is complete and available at all times on site. The Contractor must ensure that senior and other relevant members of the workforce are trained in dealing with spills by using emergency spill kits.</li> <li>• All spills of hazardous substances must be reported to the EO or ECO.</li> <li>• The Contractor must comply with the regulations of the OHS&amp;A.</li> </ul>	
Batching Plants (if applicable)	<ul style="list-style-type: none"> <li>• Dust emissions, wastewater generation, and noise pollution.</li> </ul>	<ul style="list-style-type: none"> <li>• The Contractors must provide and maintain a method statement for “cement and concrete batching”. The method statement must provide information on proposed storage, washing &amp; disposal of cement, packaging, tools and equipment.</li> <li>• The mixing of concrete must only be done at specifically selected sites on mortar boards or similar structures to contain run-off into</li> </ul>	<ul style="list-style-type: none"> <li>• Mitigation measures to be monitored on a daily basis by the Contractor EO. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
		soils. <ul style="list-style-type: none"> <li>• Cleaning of cement mixing and handling equipment must be done using proper cleaning trays.</li> <li>• All empty containers must be stored in a dedicated area and later removed from the site for appropriate disposal at a licensed facility.</li> <li>• Any spillage that may occur must be investigated and immediate remedial action must be taken.</li> <li>• The visible remains of concrete, either solid, or from washings, must be physically removed immediately and disposed of as waste to a registered waste disposal site.</li> <li>• Cement batching areas must be located in consultation with the RE, his/ her EO or ECO to ensure residues are contained.</li> </ul>	
Dust Emissions	<ul style="list-style-type: none"> <li>• Reduced air quality, nuisance to neighbouring receptors, and vegetation impacts.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure that all vehicles and machinery are adequately maintained to minimise exhaust emissions.</li> <li>• All loose materials transported to, or from, site must be transported in such a manner that they do not fly or fall off the vehicle. This may necessitate covering or wetting friable materials.</li> <li>• No burning of waste, such as plastic bags, cement bags and litter is permitted.</li> <li>• Provide complaints register to report any excessive air quality related incidents.</li> <li>• Regular clean-up around any material handling points to avoid re-entrainment of settled dust by wind gusts or vehicles.</li> <li>• Immediate clean-up of any spillages to reduce re-entrainment by vehicles.</li> <li>• Regular sweeping and washing of all on-site paved roads to avoid re-entrainment of deposited dust by vehicles moving on the on-site paved roads.</li> <li>• Delivery vehicles should shorten idling times to minimise diesel particulate matter (DPM) production.</li> <li>• Dust dispersion from construction activities shall be limited and suppressed to the maximum extent practical. The liberation of dust into the surrounding environment shall be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents.</li> <li>• Regular dust monitoring and reporting to be undertaken.</li> <li>• Dust control must be implemented by wetting all bare surfaces with a water bowser.</li> </ul>	<ul style="list-style-type: none"> <li>• Mitigation measures to be monitored on a daily basis by the Contractor EO. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
		<ul style="list-style-type: none"> <li>• Water must be sourced from a registered water source.</li> <li>• The Contractor must wet down all bare surfaces at least once per day and in windy, dry conditions, more than once where necessary.</li> <li>• Care must be taken not to over-water the areas and cause erosion and structural damage to the soil.</li> <li>• Topsoil stockpiles should be seeded with a grass mix to protect the soil from blowing away if the stockpile will not be used within 3 months.</li> <li>• Other stockpiles should be wetted down if they are prone to dust blowing off these items. Where spraying of water on stockpiles is not adequate for dust control, environmentally benign binding agents shall be used to limit wind-blown dust.</li> <li>• The speed of construction vehicles must be strictly controlled to avoid dangerous conditions, excessive dust or excessive deterioration of the road being used.</li> <li>• Construction vehicles to be covered when transporting construction materials from and to the site.</li> </ul>	
Noise Management	<ul style="list-style-type: none"> <li>• Disturbance to surrounding communities and fauna.</li> </ul>	<ul style="list-style-type: none"> <li>• Equipment must be maintained in good working order, within service dates, and inspected before use.</li> <li>• Fit equipment, machinery and vehicles generating excessive noise with appropriate noise abatement measures, if deemed necessary, and they must undergo regular maintenance to ensure optimum efficiency during construction.</li> <li>• Provide complaints register to report any excessive noise incidents.</li> <li>• The activities must comply with the requirements of the OHSA.</li> <li>• Noise-generating activities associated with construction activities should be kept to a minimum.</li> <li>• Work hours (06:00 – 18:00) during the construction phase must be strictly enforced unless permission is given. Permission must not be granted without consultation with the local residents and businesses by the EO.</li> <li>• All construction equipment or machinery should be switched off when not in use.</li> <li>• Construction equipment must be kept in good working condition and must be serviced on a regular basis to ensure that they are not generating excessive noise.</li> <li>• Noise reduction is essential, and Contractors must endeavour to limit unnecessary noise, especially loud talking, shouting or</li> </ul>	<ul style="list-style-type: none"> <li>• Mitigation measures to be monitored on a daily basis by the contractor. The ECO is to check if mitigation measures are being properly implemented.</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
		<p>whistling, radios, sirens or hooters, motor revving, etc. The use of silent compressors is a specific requirement.</p> <ul style="list-style-type: none"> <li>Noisy activities must take place only during working hours. The EO must inform businesses adjacent to the development in writing 24 hours prior to any planned activities that will be unusually noisy or any other activities that could reasonably have an impact on the adjacent sites.</li> </ul>	
Visual Impact	<ul style="list-style-type: none"> <li>Degradation of landscape character and visual intrusion.</li> </ul>	<ul style="list-style-type: none"> <li>Construction camp must be established in appropriate locations prior to the commencement of construction activities. The camp must be maintained in an orderly and tidy condition.</li> <li>No littering at the site.</li> <li>Sufficient containers must be made available to handle the amount of litter, wastes, rubbish, debris and builders' wastes generated on site. These containers must be emptied frequently to avoid rodents, insects or any other organisms accumulating on the site and becoming a health hazard to adjacent properties.</li> <li>No waste is to remain at the construction site for more than two (2) weeks.</li> <li>Waste must be separated into recyclable and non-recyclable waste, and shall be separated as follows: <ul style="list-style-type: none"> <li>Hazardous waste – including (but not limited to) old oil and paint.</li> <li>General waste - including (but not limited to) construction rubble, reusable construction material.</li> <li>Recyclable waste shall preferably be deposited in separate bins. The contractor is advised that "Collect-a-Can" collect tins, including paint and chemical tins, and "Consol" collect glass for recycling.</li> </ul> </li> <li>Any illegal dumping of waste will not be tolerated. This action will result in a fine and if required further legal action will be taken. This aspect must be closely monitored and reported on.</li> <li>Proof of legal dumping must be produced on request.</li> <li>Bins must be clearly marked for ease of management. All refuse bins must have a lid secured so that animals cannot gain access.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Fire Prevention	<ul style="list-style-type: none"> <li>Injury, loss of property, and destruction of vegetation and habitat.</li> </ul>	<ul style="list-style-type: none"> <li>The Contractors must provide and maintain a method statement for "fires", clearly indicating where and for what fires will be utilised plus details on the fuel to be utilised.</li> <li>Absolutely no burning of waste is permitted.</li> <li>Prohibit open fires and maintain firebreaks where necessary.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored on a daily basis by the Contractor EO. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Stockpiling and Stockpile Areas	<ul style="list-style-type: none"> <li>Dust generation, erosion, and</li> </ul>	<ul style="list-style-type: none"> <li>All stockpiles must be stored on flat developed or to be paved</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
	sedimentation of nearby watercourses.	<p>over areas where run-off will be minimised and be surrounded by berms. Stockpiles must also only be stored for the minimum amount of time necessary.</p> <ul style="list-style-type: none"> <li>All stockpiled material must be easily accessible without any environmental damage.</li> <li>All temporarily stockpiled material must be stockpiled in such a way that the spread of materials is minimised.</li> <li>Stockpiles are to be stabilised prior to the loss of soils due to erosion.</li> <li>Soils from different horizons must be stockpiled such that topsoil stockpiles do not get contaminated by sub-soil material.</li> <li>No equipment, workforce or any construction related activities may be allowed onto the topsoil stockpiles.</li> <li>Topsoil stockpiles must be clearly demarcated as no-go areas.</li> <li>Stockpiles must not be higher than 2m to avoid compaction thereby maintaining the soil integrity and chemical composition (for the topsoil stockpiles that will be used for re-vegetation).</li> </ul>	on a daily basis by the Contractor EO. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.
Excavation of Foundations, Cable Trenches and Drainage Systems	<ul style="list-style-type: none"> <li>Soil erosion, dust generation, and disturbance of vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>Minimise excavation footprint, stockpile topsoil separately and implement erosion controls.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Installation of Foundations, Cable Trenches and Drainage Systems	<ul style="list-style-type: none"> <li>Soil contamination, habitat disturbance, and waste generation.</li> </ul>	<ul style="list-style-type: none"> <li>Implement good housekeeping and prevent contamination during installation.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Installation of Equipment	<ul style="list-style-type: none"> <li>Disturbance of land and risk of accidental spills.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure equipment installation remains within approved footprint.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Socio-Economic Benefits and Impacts	<ul style="list-style-type: none"> <li>Community conflict, unrealistic employment expectations, or social disruption.</li> </ul>	<ul style="list-style-type: none"> <li>Maximise local labour participation and manage community grievances.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
Temporary Site Closure	<ul style="list-style-type: none"> <li>Environmental degradation due to unattended infrastructure and erosion.</li> </ul>	<ul style="list-style-type: none"> <li>Secure the site and maintain environmental controls during inactivity.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Landscaping and Rehabilitation	<ul style="list-style-type: none"> <li>Failure to restore ecological function and visual quality of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Progressively rehabilitate disturbed areas where feasible.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>
Agricultural Resources, Soil and Land Capability	<ul style="list-style-type: none"> <li>Damage of agricultural and soil resources.</li> </ul>	<ul style="list-style-type: none"> <li>Cleared areas must be rehabilitated and stabilised to avoid impacts to adjacent areas.</li> <li>Restrict the disturbance footprint and the clearing of vegetation for the authorised area only.</li> <li>Make use of existing access routes as much as possible before new routes are considered.</li> <li>Promptly remove all Alien and Invasive Plant species (AIPs) that may emerge during construction (i.e., weedy annuals and other alien forbs) must be removed.</li> <li>Limit soil disturbance outside the project development footprint and its associated infrastructure.</li> <li>Keep excavation and soil heaps neat and tidy.</li> <li>Lightly till any disturbed soil around the development footprint to avoid compaction.</li> <li>Ensure soil stockpiles sand are sufficiently safeguarded against rain wash.</li> <li>Minimise unnecessary clearing of vegetation beyond the development footprints.</li> <li>The use of herbicides is not recommended (opt for mechanical removal).</li> <li>Make sure all excess consumables are removed from site and deposited at an appropriate waste facility.</li> <li>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.</li> <li>Provide appropriate sanitation facilities for workers during construction and service them regularly.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
		<ul style="list-style-type: none"> <li>• 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.</li> <li>• The Contractor must be in possession of an emergency spill kit that must be complete and available at all times on site.</li> <li>• Any possible contamination of topsoil by hydrocarbons must be avoided. Any contaminated soil must be treated in situ or be placed in containers and removed from the site for disposal in a licensed facility.</li> </ul>	
Terrestrial Biodiversity (Fauna and Flora)	<ul style="list-style-type: none"> <li>• Vegetation, animals and habitats disturbances</li> </ul>	<ul style="list-style-type: none"> <li>• All activities must be restricted to the approved project footprint to avoid unnecessary disturbance to adjacent areas within the existing mine property. No disturbance must occur outside demarcated work areas.</li> <li>• The construction footprint must be clearly demarcated prior to the commencement of works, and all personnel must be made aware of the site limits during induction.</li> <li>• A hydrocarbon spill management plan must be put in place to ensure that any chemical spill out or over does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site.</li> <li>• Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary.</li> <li>• All contaminated soil/ yard stone shall be treated in situ or removed and be placed in containers.</li> <li>• Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair.</li> <li>• All construction and maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited.</li> <li>• No hunting, trapping, killing, harming or deliberate disturbance of fauna by site personnel may be permitted.</li> <li>• An AIP Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual change in AIP composition.</li> <li>• Any alien or weedy plant species establishing within newly disturbed areas associated with the project must be identified and controlled in accordance with existing mine procedures.</li> </ul>	<ul style="list-style-type: none"> <li>• Mitigation measures to be monitored throughout the phase by the Contractor. The ECO is to check on a monthly basis if mitigation measures are being properly implemented. The EO must conduct daily audits.</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
<b>OPERATIONAL PHASE</b>			
Environmental Awareness Training	<ul style="list-style-type: none"> <li>Environmental non-compliance due to lack of awareness.</li> </ul>	<ul style="list-style-type: none"> <li>Train operational personnel on environmental obligations and emergency procedures.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Construction Site Establishment	<ul style="list-style-type: none"> <li>Unnecessary disturbance of land, vegetation, and sensitive areas.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain site infrastructure within approved footprint.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Access restricted areas and areas where no development is permitted	<ul style="list-style-type: none"> <li>Disturbance or destruction of environmentally sensitive areas.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain access controls and monitoring of restricted areas.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Access Roads	<ul style="list-style-type: none"> <li>Soil erosion, dust generation, vegetation loss, and habitat fragmentation.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct routine maintenance and repair erosion damage.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Fencing and Gate Installations	<ul style="list-style-type: none"> <li>Disturbance of vegetation and fauna movement.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain fencing and gates in good condition.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Water Supply Management	<ul style="list-style-type: none"> <li>Excessive water consumption and depletion of local water resources.</li> </ul>	<ul style="list-style-type: none"> <li>Monitor water consumption and implement conservation measures.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Stormwater and Wastewater Management	<ul style="list-style-type: none"> <li>Pollution of soil, surface water, and groundwater.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain drainage systems and inspect regularly.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Solid Waste Management	<ul style="list-style-type: none"> <li>Littering, pollution, attraction of vermin, and visual degradation.</li> </ul>	<ul style="list-style-type: none"> <li>Implement waste minimisation, recycling and proper disposal practices.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
Protection of Natural Water Channels and Water Bodies	<ul style="list-style-type: none"> <li>Sedimentation, contamination, and alteration of natural drainage patterns.</li> </ul>	<ul style="list-style-type: none"> <li>Regularly inspect for contamination and erosion.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Vegetation Clearance	<ul style="list-style-type: none"> <li>Loss of vegetation, habitat destruction, and increased erosion.</li> </ul>	<ul style="list-style-type: none"> <li>Prevent unnecessary vegetation disturbance during maintenance activities.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Protection of Fauna and Flora	<ul style="list-style-type: none"> <li>Injury, displacement, or mortality of fauna and destruction of sensitive plant species.</li> </ul>	<ul style="list-style-type: none"> <li>Minimise disturbance from operational activities.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Protection of Heritage Resources	<ul style="list-style-type: none"> <li>Damage to archaeological, cultural, or historical resources.</li> </ul>	<ul style="list-style-type: none"> <li>Protect identified heritage resources.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Safety of the Public	<ul style="list-style-type: none"> <li>Injury to members of the public from construction activities and equipment.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain security measures and access control.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Sanitation	<ul style="list-style-type: none"> <li>Soil and water contamination from inadequate sanitation facilities.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure operational sanitation facilities are functional.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Prevention of Diseases	<ul style="list-style-type: none"> <li>Spread of communicable diseases among workers and communities.</li> </ul>	<ul style="list-style-type: none"> <li>Continue awareness programmes and maintain hygienic conditions.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Emergency Procedures	<ul style="list-style-type: none"> <li>Delayed response to accidents, fires, or spills resulting in environmental damage.</li> </ul>	<ul style="list-style-type: none"> <li>Regularly review and test emergency procedures.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
Hazardous Substances Management	<ul style="list-style-type: none"> <li>Soil and water contamination from spills or leaks.</li> </ul>	<ul style="list-style-type: none"> <li>Inspect storage facilities and maintain spill response readiness.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Workshop, Equipment Maintenance and Storage	<ul style="list-style-type: none"> <li>Hydrocarbon contamination of soil and water resources.</li> </ul>	<ul style="list-style-type: none"> <li>Continue preventative maintenance and spill prevention practices.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Batching Plants (if applicable)	<ul style="list-style-type: none"> <li>Dust emissions, wastewater generation, and noise pollution.</li> </ul>	<ul style="list-style-type: none"> <li>Not applicable unless batching facilities remain operational.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Dust Emissions	<ul style="list-style-type: none"> <li>Reduced air quality, nuisance to neighbouring receptors, and vegetation impacts.</li> </ul>	<ul style="list-style-type: none"> <li>Monitor dust generation during maintenance activities.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Noise Management	<ul style="list-style-type: none"> <li>Disturbance to surrounding communities and fauna.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain equipment to minimise operational noise.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Visual Impact	<ul style="list-style-type: none"> <li>Degradation of landscape character and visual intrusion.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain infrastructure appearance and landscaping.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Fire Prevention	<ul style="list-style-type: none"> <li>Injury, loss of property, and destruction of vegetation and habitat.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain fire detection and suppression systems for BESS facilities.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Stockpiling and Stockpile Areas	<ul style="list-style-type: none"> <li>Dust generation, erosion, and sedimentation of nearby watercourses.</li> </ul>	<ul style="list-style-type: none"> <li>Monitor stockpiles if retained on site.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
Excavation of Foundations, Cable Trenches and Drainage Systems	<ul style="list-style-type: none"> <li>Soil erosion, dust generation, and disturbance of vegetation.</li> </ul>	<ul style="list-style-type: none"> <li>Inspect excavated infrastructure for stability and maintenance.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Installation of Foundations, Cable Trenches and Drainage Systems	<ul style="list-style-type: none"> <li>Soil contamination, habitat disturbance, and waste generation.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain installed infrastructure and monitor performance.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Installation of Equipment	<ul style="list-style-type: none"> <li>Disturbance of land and risk of accidental spills.</li> </ul>	<ul style="list-style-type: none"> <li>Regularly inspect and maintain equipment to prevent leaks or failures.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Socio-Economic Benefits and Impacts	<ul style="list-style-type: none"> <li>Community conflict, unrealistic employment expectations, or social disruption.</li> </ul>	<ul style="list-style-type: none"> <li>Continue supporting local economic opportunities where possible.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Temporary Site Closure	<ul style="list-style-type: none"> <li>Environmental degradation due to unattended infrastructure and erosion.</li> </ul>	<ul style="list-style-type: none"> <li>Inspect and maintain infrastructure during temporary shutdowns.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Landscaping and Rehabilitation	<ul style="list-style-type: none"> <li>Failure to restore ecological function and visual quality of the site.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain rehabilitated areas and control invasive species.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Battery Storage Units	<ul style="list-style-type: none"> <li>Fire, explosion, thermal runaway, and release of hazardous substances.</li> </ul>	<ul style="list-style-type: none"> <li>Install fire detection and suppression systems, implement emergency response procedures, conduct regular inspections, and ensure compliance with manufacturer specifications and relevant safety standards.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>
Agricultural Resources, Soil and Land Capability	<ul style="list-style-type: none"> <li>Damage of agricultural and soil resources.</li> </ul>	<ul style="list-style-type: none"> <li>Implement erosion control methods like mulching, geotextile sheets, reduce soil compaction, chemical spills which can affect soil fertility.</li> <li>Ensure successful rehabilitation of areas disturbed during construction and these areas are stabilised to avoid impacts to adjacent areas.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>

Activities	Potential Impacts	Mitigation Measures	Frequency Of Action and the Responsible Party
Terrestrial Biodiversity (Fauna and Flora)	<ul style="list-style-type: none"> <li>Vegetation, animals and habitats disturbances.</li> </ul>	<ul style="list-style-type: none"> <li>A hydrocarbon spill management plan must be put in place to ensure that any chemical spill out or over does not run into the surrounding areas. The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site.</li> <li>Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. No servicing of equipment on site unless necessary.</li> <li>All contaminated soil/ yard stone shall be treated in situ or removed and be placed in containers.</li> <li>Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair.</li> <li>All maintenance motor vehicle operators should undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must still be enforced to ensure that road killings and erosion is limited.</li> <li>No hunting, trapping, killing, harming or deliberate disturbance of fauna by site personnel may be permitted.</li> <li>An AIP Management Plan must be compiled and implemented. This should regularly be updated to reflect the annual change in AIP composition.</li> <li>Any alien or weedy plant species establishing within newly disturbed areas associated with the project must be identified and controlled in accordance with existing mine procedures.</li> </ul>	<ul style="list-style-type: none"> <li>Mitigation measures to be monitored throughout the phase by Tharisa. Tharisa is to check on a daily basis if mitigation measures are being properly implemented.</li> </ul>

### DECOMMISSIONING PHASE

The proposed BESS Development is expected to have a long-term operational outlook with no decommissioning/ closure occurring in the foreseeable future. Regular maintenance and upgrades, where necessary, will be carried out by Tharisa. In the unlikely event that decommissioning becomes necessitated, a Rehabilitation and a Closure Plan will be compiled, nearer to the decommissioning/ closure event. The mitigation measures prescribed for the Construction Phase will be applied.

Allowing such planning at a future time, nearer to the decommissioning/ closure event, will ensure that the prevailing legislation and best practice and regional objectives, at that future time, can be applied to the decommissioning/ closure of the BESS Development.

**Table 6: Summary of Environmental Mitigation Measures**

Environmental Theme	Key Risk / Impact	Mitigation Measures	Responsible Party	Monitoring Approach	Residual Impact
Terrestrial Biodiversity	Disturbance of already modified habitat	<ul style="list-style-type: none"> <li>Restrict activities to demarcated footprint</li> </ul>	Contractor / EO / ECO	<ul style="list-style-type: none"> <li>Daily inspections</li> <li>ECO monthly audits</li> </ul>	Low

Environmental Theme	Key Risk / Impact	Mitigation Measures	Responsible Party	Monitoring Approach	Residual Impact
		<ul style="list-style-type: none"> <li>No disturbance outside mine area</li> <li>Control invasive species</li> </ul>			
<b>Aquatic / Water Resources</b>	Contamination from spills or runoff	<ul style="list-style-type: none"> <li>No discharge to natural watercourses</li> <li>Stormwater linked to mine system</li> <li>Contaminated water contained and removed</li> </ul>	Contractor / EO / ECO	<ul style="list-style-type: none"> <li>Regular inspections</li> <li>Incident reporting</li> </ul>	Low
<b>Soil &amp; Land Capability</b>	Soil contamination or erosion	<ul style="list-style-type: none"> <li>Spill prevention and clean-up</li> <li>Topsoil management and rehabilitation</li> <li>Limit disturbance footprint</li> </ul>	Contractor / EO	<ul style="list-style-type: none"> <li>Site monitoring</li> <li>Rehabilitation checks</li> </ul>	Low
<b>Air Quality</b>	Gas emissions (Cl) and dust	<ul style="list-style-type: none"> <li>Scrubber system to treat gas</li> <li>Gas monitoring sensors</li> <li>Dust suppression (water spraying)</li> </ul>	Contractor / ECO	<ul style="list-style-type: none"> <li>Continuous monitoring</li> <li>Complaint register</li> </ul>	Low
<b>Hazardous Chemicals</b>	Chemical spills (HCl, NaOH, electrolyte)	<ul style="list-style-type: none"> <li>Bunded storage <math>\geq 110\%</math> capacity</li> <li>Spill collection sump</li> <li>Licensed waste removal</li> </ul>	Contractor / EO / ECO	<ul style="list-style-type: none"> <li>Daily inspections</li> <li>Monthly audit</li> </ul>	Low
<b>Waste Management</b>	Improper waste disposal	<ul style="list-style-type: none"> <li>All waste removed by licensed contractors</li> <li>No on-site disposal</li> <li>Waste separation (hazardous/general)</li> </ul>	Contractor / EO	<ul style="list-style-type: none"> <li>Waste records</li> <li>Audit reporting</li> </ul>	Low
<b>Fire &amp; Safety Risk (BESS)</b>	Fire/ system failure	<ul style="list-style-type: none"> <li>Fire detection and suppression systems</li> <li>Emergency shutdown procedures</li> <li>Compliance with safety standards</li> </ul>	Contractor / Tharisa	<ul style="list-style-type: none"> <li>Routine inspections</li> <li>Emergency drills</li> </ul>	Low
<b>Spills &amp; Emergency Events</b>	Accidental leaks or incidents	<ul style="list-style-type: none"> <li>Emergency response plan</li> <li>Spill kits on site</li> <li>Trained personnel</li> </ul>	Contractor / ECO	<ul style="list-style-type: none"> <li>Incident register</li> <li>Corrective action tracking</li> </ul>	Low
<b>Noise &amp; Visual Impact</b>	Disturbance to surrounding area	<ul style="list-style-type: none"> <li>Limit working hours</li> <li>Maintain site housekeeping</li> <li>Use existing infrastructure</li> </ul>	Contractor / EO	<ul style="list-style-type: none"> <li>Site inspections</li> </ul>	Low
<b>Socio-economic / Community</b>	Disturbance or community concerns	<ul style="list-style-type: none"> <li>Stakeholder engagement</li> <li>Controlled access to site</li> <li>Grievance mechanisms</li> </ul>	Tharisa / EAP	<ul style="list-style-type: none"> <li>PPP records</li> <li>Complaints register</li> </ul>	Low

## SECTION 7: CONCLUSION

This EMPr is compiled in accordance with Section 24N of the NEMA. The purpose of this EMPr is to monitor and ensure compliance during pre-construction, construction, operational and decommissioning phases of the proposed project. This EMPr has been compiled to provide recommendations and guidelines to minimise the potential environmental impacts during all phases of the project and it will be used as a compliance monitoring document that will always be available on site during the life of the proposed BESS Development. As a legally binding document, this EMPr requires Tharisa to implement all prescribed mitigation measures to prevent anticipated environmental impacts.

The EMPr also defines the roles and responsibilities of the persons and parties responsible for implementation across all project phases. The appointed parties identified in Section 5-1 will be responsible for monitoring compliance and ensuring that all prescribed mitigation measures are implemented.

Tharisa must maintain its commitment to environmental protection by complying with all applicable legislation and ensuring that its activities do not pose risks to the environment or neighbouring communities. Tharisa must also continue engaging with the Competent Authorities to confirm that all prescribed measures meet the required standards.

## SECTION 8: REFERENCES

CTS Heritage (2026). Heritage Screener.

Department of Environmental Affairs and Tourism (DEAT) (2004). IEM Guideline Series, Department of Environmental Affairs, Pretoria.

Site Sensitivity Verification Report (SSVR) For the Proposed Tharisa Battery Energy Storage System (BESS) Development, June 2026.

The Biodiversity Company (2026). Agricultural Theme Site Sensitivity Verification Report for the proposed Tharisa Minerals (Pty) Ltd Battery Energy Storage System (BESS) Project.

The Biodiversity Company (2026). Aquatic Biodiversity Theme Site Sensitivity Verification Report for the proposed Tharisa Minerals (Pty) Ltd Battery Energy Storage System (BESS) Project.

The Biodiversity Company (2026). Terrestrial Biodiversity, Plant and Animal Theme Site Sensitivity Verification for the proposed Tharisa Minerals (Pty) Ltd Battery Energy Storage System (BESS) Project.

WSP (2026). Civil Aviation Compliance Statement of the Proposed Tharisa Minerals (Pty) Ltd Battery Energy Storage System (BESS) Development Project.

**APPENDIX 1: EAP CURRICULUM VITAE**