EIMS | ENVIRONMENTAL IMPACT MANAGEMENT SERVICES

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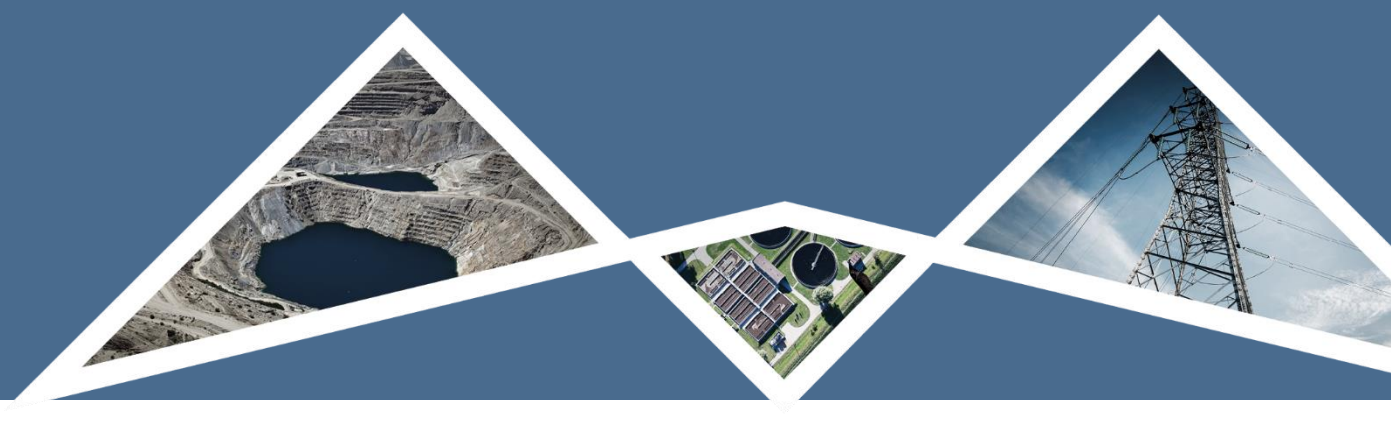
ENVIRONMENTAL MANAGEMENT PROGRAMME:

THE PROPOSED GLENCORE LYDENBURG SOLAR PHOTOVOLTAIC FACILITY AT THE LYDENBURG SMELTER, MPUMALANGA PROVINCE



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Abbreviations

BPEO	:	Best Practicable Environmental Option
DEFF	:	Department of Environment, Forestry and Fisheries
DWAF	:	Department of Water Affairs and Forestry (now DHSWS)
DHSWS	:	Department of Human Settlements, Water and Sanitation
EA	:	Environmental Authorisation
CBA	:	Critical Biodiversity Area
CLO	:	Community Liaison Officer
EAP	:	Environmental Assessment Practitioner
ECO	:	Environmental Control Officer
EO	:	Environmental Officer
EIA	:	Environmental Impact Assessment
EIMS	:	Environmental Impact Management Services (Pty) Ltd
EMF	:	Environmental Management Framework
EMPr	:	Environmental Management Programme
EPRP	:	Emergency Preparedness and Response Plan
ESA	:	Ecological Support Area
HSEQ	:	Health, Safety, Environment and Quality
I&AP	:	Interested and Affected Party
ISO	:	International Standards Organisation
NFA	:	National Forests Act (Act 84 of 1998)
NEMA	:	National Environmental Management Act (Act No. 107 of 1998)
NEMAQA	:	National Environmental Management: Air Quality Act (Act No. 39 of 2004)
NEMBA	:	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NEMWA	:	National Environmental Management: Waste Act (Act No. 59 of 2008)
NWA	:	National Water Act (Act No. 36 of 1998)
MHSA	:	Mine Health and Safety Act (Act No. 29 of 1996)
SABS	:	South African Bureau of Standards
SANAS	:	South African National Accreditation System
SWMP	:	Storm Water Management Plan

1 INTRODUCTION

Glencore (Pty) Ltd (the applicant) is one of the world's largest globally diversified natural resource companies. Glencore's four coal operations are located in the coal-rich province of Mpumalanga, while ferroalloys mines and smelters can be found across the northern part of South Africa, in the North West Province and Limpopo.

Glencore proposes to develop a Photo Voltaic (PV) facility in Lydenburg, Mpumalanga Province. Subsequently, Glencore has appointed Environmental Impact Management Services (Pty) Ltd (EIMS) as the independent Environmental Assessment Practitioner (EAP) to assist with undertaking the required authorisation processes (including the statutory public participation), and to compile and submit the required documentation in support of application for Environmental Authorisation (EA) in accordance with the National Environmental Management Act, 1998 (Act 107 of 1998 – NEMA) Environmental Impact Assessment (EIA) Regulations, 2014 as amended.- Listed activity/ies in Table 1. The proposed project involves the development of a PV facility with a capacity of up to 300 megawatts (MW) to provide power to Lydenburg smelter or will be wheeled to other Glencore operations. Other possible infrastructure will include an on-site switching station, access roads, energy storage system and a single 132kV power line. The proposed project is located on Portion 143 of Farm 30 Potloodspruit, Portions 114, 457 and 471 of Farm 31 Townlands of Lydenburg, Portion 1 of Lydenburg Smelter Erf 6099, Lydenburg Smelter Erf 2540 and Lydenburg Smelter Erf 2541 within Thaba Chweu Local Municipality (Ward 12 and 13), Ehlanzeni District Municipality, Mpumalanga Province. The electricity generated from the facility will be used at the Lydenburg smelter or will be wheeled to other Glencore operations.

The Environmental Management Programme (EMPr) has been compiled to meet the requirements for an EIA and as stipulated in the EIA Regulations, 2014. The competent authority for this application will be the North West Department of Economic Development, Environment, Conservation and Tourism (NWDEDECT).

An EMPr is an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented, and that the positive benefits of the projects are enhanced. This EMPr has been compiled as a guideline for the mitigation and management measures to be implemented to avoid, reduce and minimise potential environmental impacts arising out of the construction phase of the project.

2 SCOPE OF THIS DOCUMENT

The purpose of the EMPr is to give effect to precautionary measures, which are to be put in place for controlling the activities that take place during the construction phase of the project. The EMPr also provides guidance to assist in ensuring compliance with relevant national legislative and regulatory requirements.

It should be borne in mind, however, that the EMPr is a working document that should be updated on a regular basis, as and when necessary. Formal risk identification forms an integral part of EMPr management and assists with prioritizing and focusing the control of risks. The EMPr thus supports this on-going proactive mitigation and the duty of care to the environment. The EMPr shall therefore allow for risk minimization, rather than just ensuring legal compliance. The purpose of this EMPr is thus also to allow the user to make minor amendments to ensure continual revision and improvement of risk mitigation through the continual re-assessment of risks associated with the activity.

3 DOCUMENT STRUCTURE

Table 1: EMPr Structure

Appendix 4 Reference	Description	Section in EMPr
Appendix 4(1)(1)(a)	Details of – The EAP who prepared the EMPR; and The expertise of that EAP to prepare an EMPR, including a curriculum vitae;	Section 4.1 Section 4.2
Appendix 4(1)(1)(b)	A detailed description of the aspects of the activity that are covered by the EMPR as identified by the project description.	Section 5
Appendix 4(1)(1)(c)	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	Section 5
Appendix 4(1)(1)(d)	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 though the environmental impact assessment process for all phases of the development including – Planning and design; Pre-construction activities; Construction activities; Rehabilitation of the environment after construction and where applicable post closure; and Where relevant, operation activities;	Section 14
Appendix 4(1)(1)(f)	A description of proposed impact management actions, identifying the manner in which the impact management contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to – Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; Comply with any prescribed environmental management standards or practices; Comply with any applicable provisions of the ac regarding closure, where applicable; and Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	Section 14

Appendix 4 Reference	Description	Section in EMPr
Appendix 4(1)(1)(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 14
Appendix 4(1)(1)(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 14
Appendix 4(1)(1)(i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	Section 14
Appendix 4(1)(1)(j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 14
Appendix 4(1)(1)(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 14
Appendix 4(1)(1)(l)	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 14
Appendix 4(1)(1)(m)	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; and	Section 10
Appendix 4(1)(1)(n)	Any specific information that may be required by the competent authority.	N/A

4 REQUIREMENTS OF AN EAP

In terms of Regulation 13 of the EIA Regulations, 2014, an independent EAP, must be appointed by the applicant to manage the application. EIMS has been appointed by the Applicant as the EAP and is compliant with the definition of an EAP as defined in Regulations 1 and 13 of the EIA Regulations and Section 1 of the NEMA. This includes, inter alia, the requirement that EIMS is:

1) Objective and independent;
2) Has expertise in conducting EIA's;
3) Comply with the NEMA, the Regulations and all other applicable legislation;
4) Takes into account all relevant factors relating to the application; and
5) Provides full disclosure to the applicant and the relevant environmental authority.

The declaration of independence of the EAPs involved and the Curriculum Vitae (indicating the experience with environmental impact assessment and relevant application processes) of the consultants that were involved in the EMP process and the compilation of this report are attached as Appendix I1.

4.1 DETAILS OF THE EAP

EIMS was appointed by the Applicant as the EAP to compile this report. The contact details of the EIMS consultants who compiled the report are as follows:

Table 2: EAP Details

Name of Practitioner	**Mr John von Mayer (Consultant)**
Tel No.:	011 789 7170
E-mail:	Matshego@eims.co.za

4.2 EXPERTISE OF THE EAP

EIMS is a private and independent environmental management-consulting firm that was founded in 1993. EIMS has in excess of 29 years' experience in conducting EIAs, including many EIAs for mines and mining related projects.

Mr Matshego Keikelame is an environmrntal consultant at EIMS and has been involved in numerous significant projects the past 8 years. He has experience in Environmental Management, small to large scale Environmental Impact Assessments, Environmental Auditing, Water Use Licensing, and Public Participation. He is a Registered Candidate Natural Scientist (121534) with the South African Council Natural and Scientific Professions (SACNASP) as well as a registered EAPASA Environmental Practitioner (2019/405).

5 PROJECT DESCRIPTION

Glencore is one of the world's largest globally diversified natural resource companies and one of its largest traders. Glencore proposes the development of a Solar Photovoltaic (PV) Energy Generation Facility at the Lydenburg Smelter. The generation capacity will have a maximum of 300MW. The electricity generated from the facility will be used at the Lydenburg smelter or will be wheeled to other Glencore operations. The proposed PV facility is located in Thaba Chweu Local Municipality (Ward 12 and 13), Ehlanzeni District Municipality, Mpumalanga Province. The proposed facility will include the following infrastructure indicated in Table 3.

Table 3: Proposed infrastructure

<table>
<tr><th>Infrastructure</th><th>Length / footprint</th><th>Coordinates</th></tr>
<tr><td>Northern PV Panels</td><td>105ha</td><td>North Corner: 25° 2'54.64"S; 30°28'4.70"E
West Corner: 25° 3'23.60"S; 30°27'54.04"E
South Corner: 25° 3'47.84"S; 30°28'34.08"E
East Corner: 25° 3'2.98"S; 30°28'27.42"E
Central Point: 25°03'20.54"S; 30°28'17.19"E</td></tr>
<tr><td>Southern PV Panels</td><td>90ha</td><td>North Corner: 25° 4'5.30"S; 30°27'41.06"E
West Corner: 25° 4'41.30"S; 30°27'45.51"E
South Corner: 25° 4'42.63"S; 30°27'56.08"E
East Corner: 25° 4'13.60"S; 30°28'17.68"E
Central Point: 25° 4'26.76"S; 30°28'0.83"E</td></tr>
<tr><td>132kV Powerline</td><td>A single 2km long within a single corridor</td><td>Start point: 25° 3'35.48"S; 30°28'11.79"E
Med point: 25° 3'40.01"S; 30°27'51.05"E
Endpoint: 25° 4'4.20"S; 30°27'41.87"E</td></tr>
<tr><td>7m wide Access Roads</td><td>13.5km</td><td>There are 15 new internal Access Roads (AR) proposed in the Northern (NAR) and Southern (SAR) PV facility sites collectively.
<table>
<tr><th>Name</th><th>Start point</th><th>Med point</th><th>Endpoint</th></tr>
<tr><td colspan="4">Northern Section</td></tr>
<tr><td>NAR 1</td><td>25°03'8.00"S; 30°28'1.03"E</td><td>25°03'17.38"S; 30°28'1.03"E</td><td>25°03'27.18"S; 30°28'1.09"E</td></tr>
<tr><td>NAR 2</td><td>25°02'55.39"S; 30°28'6.81"E</td><td>25°03'14.88"S; 30°28'6.72"E</td><td>25°03'30.72"S; 30°28'6.77"E</td></tr>
</table></td></tr>
</table>

Infrastructure	Length / footprint	Coordinates			
		NAR 3	25°02'57.96"S; 30°28'14.20"E	25°03'17.47"S; 30°28'14.23"E	25°03'33.29"S; 30°28'14.28"E
		NAR 4	25°03'0.80"S; 30°28'21.68"E	25°03'19.50"S; 30°28'21.75"E	25°03'39.61"S; 30°28'21.72"E
		NAR 5	25°03'14.90"S; 30°28'27.31"E	25°03'28.90"S; 30°28'27.34"E	25°03'42.88"S; 30°28'27.27"E
		NAR 6	25°03'27.19"S; 30°28'32.96"E	25°03'37.17"S; 30°28'32.79"E	25°03'46.35"S; 30°28'32.88"E
		NAR 7	25°03'8.12"S; 30°28'1.00"E	25°03'8.12"S; 30°28'13.84"E	25°03'7.99"S; 30°28'24.91"E
		NAR 8	25°03'27.13"S; 30°28'1.03"E	25°03'27.36"S; 30°28'18.66"E	25°03'27.19"S; 30°28'32.96"E
		Southern Section			
		SAR 1	25°04'4.41"S; 30°27'49.93"E	25°04'24.29"S; 30°27'49.86"E	25°04'41.81"S; 30°27'49.92"E
		SAR 2	25°04'8.84"S; 30°27'57.44"E	25°04'24.85"S; 30°27'57.39"E	25°04'41.91"S; 30°27'57.40"E
		SAR 3	25°04'11.32"S; 30°28'4.99"E	25°04'23.40"S; 30°28'5.03"E	25°04'37.26"S; 30°28'4.89"E
		SAR 4	25°04'12.86"S; 30°28'10.53"E	25°04'23.32"S; 30°28'10.56"E	25°04'34.25"S; 30°28'10.49"E
		SAR 5	25°04'14.18"S; 30°28'18.05"E	25°04'23.38"S; 30°28'17.99"E	25°04'31.68"S; 30°28'18.05"E
		SAR 6	25°04'19.45"S; 30°27'43.79"E	25°04'19.54"S; 30°28'2.49"E	25°04'19.46"S; 30°28'20.89"E
		SAR 7	25°04'31.90"S; 30°27'46.30"E	25°04'31.85"S; 30°28'1.00"E	25°04'31.98"S; 30°28'13.94"E
Northern on-site battery energy storage facility including switching station	0.7ha	North Corner: 25°03'32.02"S; 30°28'11.78"E West Corner: 25°03'32.91"S; 30°28'11.12"E South Corner: 25°03'36.53"S; 30°28'17.02"E			

Infrastructure	Length / footprint	Coordinates
		East Corner: 25°03'35.66"S; 30°28'17.73"E
Southern on-site battery energy storage facility including switching station	0.72ha	North Corner: 25°04'4.10"S; 30°27'41.07"E West Corner: 25°04'5.19"S; 30°27'41.09"E South Corner: 25°04'5.16"S; 30°27'48.25"E East Corner: 25°04'4.08"S; 30°27'48.24"E
Laydown Area	2.3ha	North Corner: 25° 3'37.96"S; 30°28'15.79"E West Corner: 25° 3'40.23"S; 30°28'14.01"E South Corner: 25° 3'44.81"S; 30°28'21.76"E East Corner: 25° 3'42.57"S; 30°28'23.60"E
Expansion of Eskom Yard	0.6ha	North Corner: 25° 3'38.45"S; 30°28'8.30"E West Corner: 25° 3'39.73"S; 30°28'7.37"E South Corner: 25° 3'42.13"S; 30°28'11.50"E East Corner: 25° 3'40.91"S; 30°28'12.45"E

A PV plant is designed to produce bulk electrical power from solar radiation. The solar power plant uses solar energy to produce electrical power. Therefore, it is a conventional power plant. Solar energy can be used directly to produce electrical energy using solar PV panels or alternatively using concentrated solar energy. When using concentrated solar energy, the radiation energy of solar is first converted into heat (thermal energy) and this heat is used to drive a conventional generator. This method is difficult and not efficient to produce electrical power on a large scale. Hence, to produce electrical power on a large scale, solar PV panels are used, similar to the design of the proposed PV Facility. The major components of the solar photovoltaic system are listed and discussed Table 4.

Table 4: Components of the solar photovoltaic system

Component	Description
Photovoltaic (PV) panel	A PV system consists of PV panels that encase the solar cells. PV panels or Photovoltaic panel is a most important component of a solar power plant. It is made up of small solar cells. This is a device that is used to convert solar photon energy into electrical energy. Generally, silicon is used as a semiconductor material in solar cells. The typical rating of silicon solar cells is 0.5 V and 6 Amp and it is equivalent to 3 W power. The number of cells is connected in series or parallel and makes a solar module.
Inverter	The output of the solar panel is in the form of Direct Current (DC). The most of load connected to the power system network is in the form of Alternating Current (AC). Therefore, an inverter is used to convert DC output power into AC power in solar power plants
Energy storage devices	Various types of energy storage devices are available i.e. Mechanical, electromagnetic, electrochemical and thermal. These systems are used to store energy generated by the solar

Component	Description
	power plants to be used at a later stage. The storage components need to meet the demand and variation of the load. This component is used especially when the sunshine is not available. These devices are managed with an energy management system to enable maximum effective utilisation of the available energy.
System balancing component	It is a set of components used to control, protect and distribute power in the system. These devices ensure that the system working in proper condition and utilize energy in the proper direction. And it ensures maximum output and security of other components of a solar power plant.

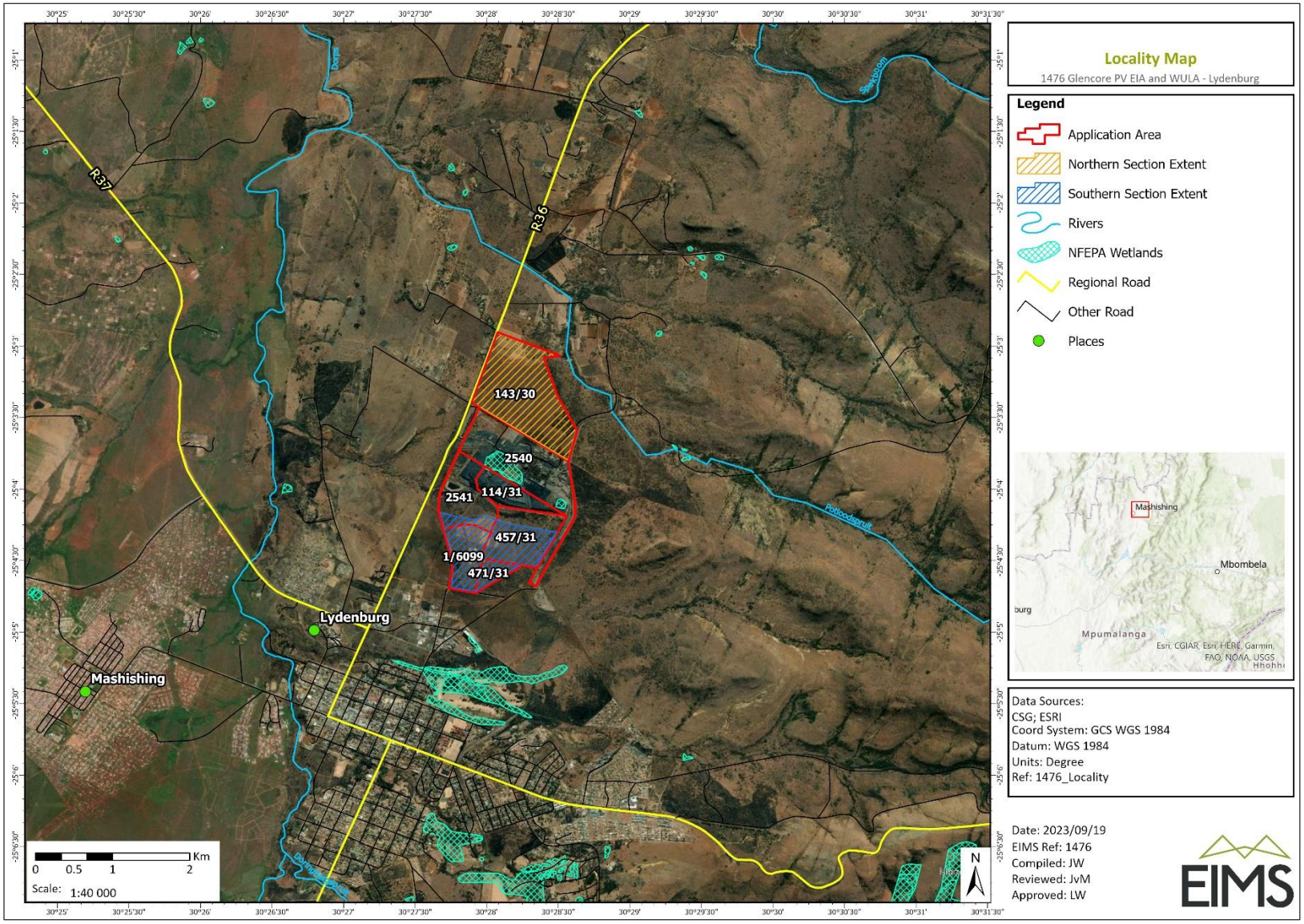


Figure 1: Locality Map

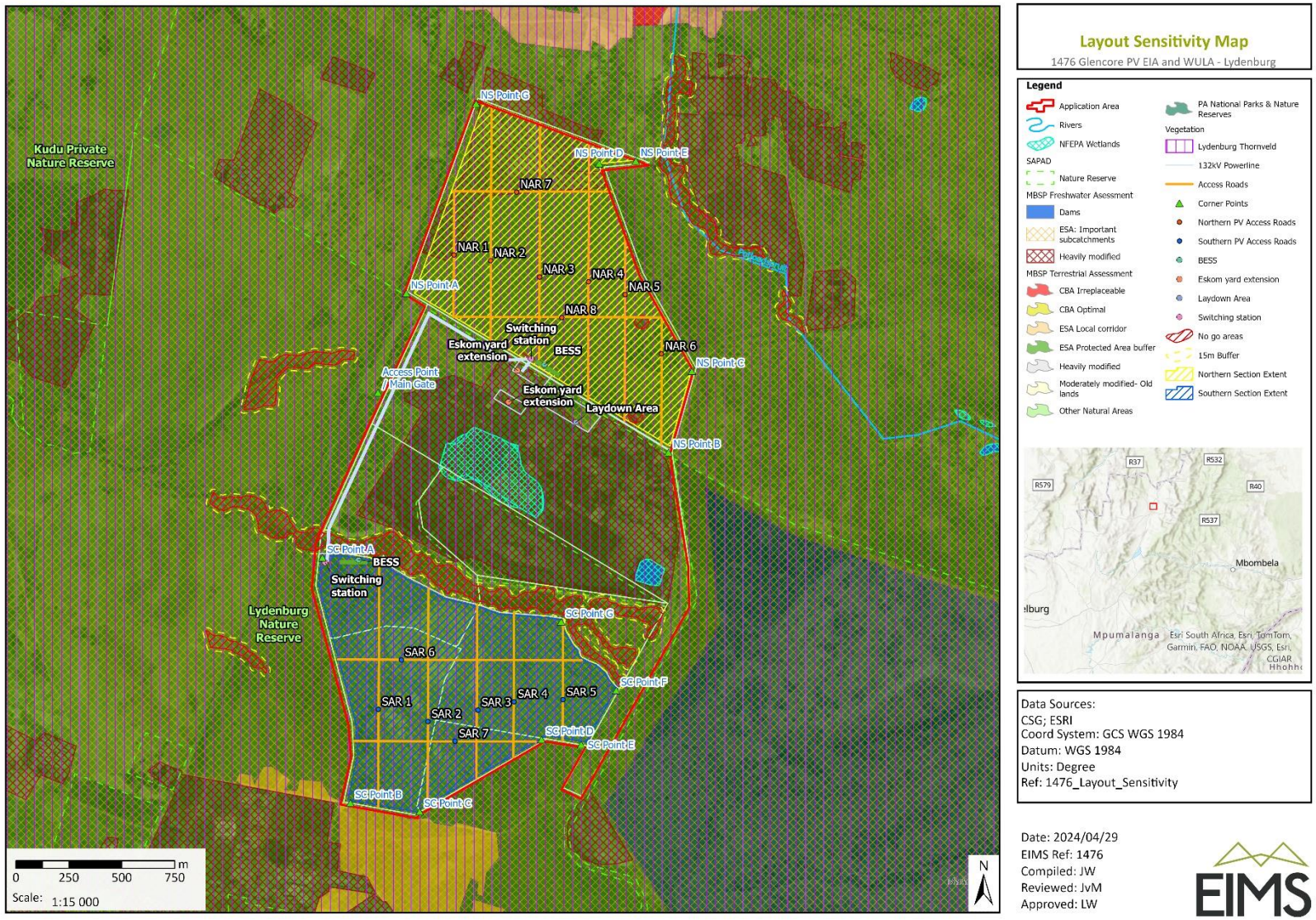


Figure 2: Sensitivity Map

5.1 POTENTIAL IMPACTS IDENTIFIED

Potential impacts associated with the proposed activity at the selected site have been identified and addressed in the EMPr and are summarised in the tables below:

Table 5: Impacts identified and assessed

Impact No. and Description	Phase of Development	Direct or Indirect
Impact 1: Destruction and further fragmentation of the vegetation community	Construction & Operations	Direct
Impact 2: Further encroachment of Invasive Alien Plants	Operations	Indirect
Impact 3: Erosion due to stormwater runoff	Construction & Operations	Direct
Impact 4: Direct mortality and displacement of faunal community	Construction & Operations	Direct
Impact 5: Faunal displacement due to habitat loss	Construction & Operations	Indirect
Impact 6: Potential impacts on heritage and archaeological resources	Construction	Direct
Impact 7: Noise	Construction	Direct
Impact 8: Air Quality (Dust generation)	Construction	Direct
Impact 9: Job Creation	Construction	Direct
Impact 10: Safety and Traffic	Construction	Direct

6 ENVIRONMENTAL MANAGEMENT APPROACH

The compilation of an EMPr for an activity which is likely to result in significant environmental impacts is typically compiled at the culmination of a thorough investigation into the receiving environment and the identification and assessment of likely environmental impacts (i.e. EIA). This EMPr forms part of an Environmental Impact Assessment process. This EMPr aims to comply with the requirement of Appendix 4 of the EIA Regulations, 2014. These requirements are systematically addressed in the subsequent sections of this report. The primary objectives of the EMPr are as follows:

- To promote sustainability and describe an action programme to mitigate negative impacts as far as possible;
- To be a practical document that sets out both the goals and actions required in mitigation. Though the term "mitigation" can be broad in definition, it means in this context to "allay, moderate, palliate, temper or intensify." Mitigation of a negative impact means that its effect is reduced. Mitigation of a positive impact means that its effect is increased or optimised; and
- To indicate responsibilities for the implementation of these action items within the EMPr.

This EMPr shall be deemed to have contractual standing on the basis that its contents and specifically objectives are a detailed expansion of the environmental risks and consequent requirements of the EA (if, and when issued). Where relevant the Applicant is responsible for delegating responsibility for compliance to designated parties (internal or external). Such delegation must be legally binding to the extent relevant.

The objectives and targets in this EMPr are further guided by the NEMA, and specifically by the EIA Regulations, 2014. Thus, the underlying principles of sustainable development are the ultimate objectives and target of this report. The EMPr has included measures to ensure the development activity complies with the following principles, as instilled in the NEMA, amongst others:

i. That the disturbance of ecosystems and loss of biological diversity are minimised and remedied;
ii. That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;
iii. That waste is avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner;
iv. That a risk-averse and cautious approach is applied, which considers the limits of current knowledge about the consequences of decisions and actions; and
v. That negative impacts on the environment and on people's environmental rights be anticipated, prevented and remedied.

6.1 ENVIRONMENTAL MANAGEMENT PRINCIPLES

NEMA establishes a general framework for environmental law, in part by prescribing national environmental management principles that must be applied when making decisions that may have a significant impact on the environment. These principles are briefly summarised below:

6.1.1 HOLISTIC PRINCIPLE

The Holistic principle, as defined by NEMA (Section 2(4) (b)) requires that environmental management must be integrated, acknowledging that all elements of the environment are linked and inter-related and it must take into account the effect of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option (defined below in Section 6.1.2). Holistic evaluation does not mean that a project must be looked at as a whole. It rather means that it must be accepted that there is a whole into which a project introduced. If the indications are that the project could have major adverse effects, the project must be reconsidered and where appropriate re-planned or relocated to avoid an adverse impact or to ensure a beneficial impact.

6.1.2 BEST PRACTICABLE ENVIRONMENTAL OPTION

When it is necessary to undertake any action with environmental impacts, the different options that could be considered for the purpose must be identified and defined. The Best Practicable Environmental Option (BPEO) is defined in NEMA as "the option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term." Other guidelines typically used for environmental management in terms of other legislation include BPM which is the Best Practicable Means and BAT which is the Best Available Technology.

6.1.3 SUSTAINABLE DEVELOPMENT

The concept of sustainable development was introduced in the 1980's with the aim to ensure that the use of natural resources is such that our present needs are provided without compromising the ability of future generations to meet their own needs. The constitution of South Africa is built around the fact that everyone has the right to have the environment protected through reasonable legislative and other measures that secure ecologically sustainable development. The National Environmental Principles included in the NEMA require development to be socially, environmentally and economically sustainable.

6.1.4 PREVENTATIVE PRINCIPLES

The preventative principle is fundamental to sustainable development and requires that the disturbance to ecosystems and the pollution, degradation of the environment and negative impacts on the environment be avoided, or, where they cannot be altogether avoided, are minimised and remedied.

6.1.5 THE PRECAUTIONARY PRINCIPLE

The precautionary principle requires that where there is uncertainty, based on available information, that an impact will be harmful to the environment, it is assumed, as a matter of precaution, that the said impact will be harmful to the environment until such time that it can be proven otherwise. The precautionary principle requires that decisions by the private sector, governments, institutions and individuals need to allow for and recognise conditions of uncertainty, particularly with respect to the possible environmental consequences of those decisions. In South Africa, the DHSWS (then DWAF) adopted a BPEO guideline in 1991 for water quality management and in 1994 in the Minimum Requirements document for waste management.

In terms of DWAF Minimum Requirements for the Handling and Disposal of Hazardous Waste, 1994, the precautionary principle is defined as, "Where a risk is unknown; the assumption of the worst-case situation and the making of provision for such a situation." Here the precautionary principle assumes that a waste or an identified contaminant of a waste is "both highly hazardous and toxic until proven otherwise."

In the context of the EIA process in South Africa, the precautionary principle also translates to a requirement to provide sound, scientifically based, information that is sufficient to provide the decision-making authority with reasonable grounds to understand the potential impacts on the environment, the extent thereof and how impacts could be mitigated. If such information is not adequate for this purpose, the relevant authority cannot be satisfied as is required and then the authority should require that further information be collected and provided.

6.1.6 DUTY OF CARE AND CRADLE TO GRAVE PRINCIPLE

In terms of the NEMA Section 28, "Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment."

By way of example, the principle of "duty of care" in terms of waste management emphasises the responsibility to make sure that waste is correctly stored and correctly transported, as it passes through the chain of custody to final point of disposal. This means that waste must always be stored safely and securely. The company removing and disposing of waste also holds the responsibility to hold the relevant licenses, and that waste is transported alongside the necessary paperwork.

“Cradle to Grave” refers to the responsibility a company takes for the entire life cycle of a product, service or program, from design to disposal or termination. In terms of the DWAF Minimum Requirements for the Handling and Disposal of Hazardous Waste, 1994, “any person who generates, transports, treats or disposes of waste must ensure that there is no unauthorised transfer or escape of waste from his control. Such a person must retain documentation describing both the waste and any related transactions. In this way, he retains responsibility for the waste generated or handled.” This places responsibility for a waste on the Generator and is supported by the "Cradle to Grave" principle, according to which a "manifest" accompanies each load of Hazardous Waste until it is responsibly and legally disposed. This manifest is transferred from one transporter to the next along with the load, should more than one transporter be involved. Once the waste is properly disposed of at a suitable, permitted facility, a copy of the manifest must be returned to the point of origin.” Duty of Care offers one strategy to implement sustainable development.

6.1.7 POLLUTER PAYS PRINCIPLE

The "polluter pays principle" holds that the person or organisation causing pollution is liable for any costs involved in cleaning it up or rehabilitating its effects. It is noted that the polluter will not always necessarily be the generator, as it is possible for responsibility for the safe handling, treatment or disposal of waste to pass from one competent contracting party to another. The polluter may therefore not be the generator but could be a disposal site operator or a transporter. Through the 'duty of care' principle, however, the generator will always be one of the parties held accountable for the pollution caused by the waste. Accordingly, the generator must be able to prove that the transferral of management of the waste was a responsible action. The polluter pays principle acceding to NEMA dictates that “the cost of remedying pollution, environmental degradation and consequent adverse effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.”

6.2 DUTY OF CARE RESPONSIBILITIES

Section 28 of the NEMA makes provision for duty of care, and remediation of environmental damage. The binding principles are described below:

1. Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.

   (1A) Subsection (1) also applies to a significant pollution or degradation that-

   a) occurred before the commencement of this Act;

   b) arises or is likely to arise at a different time from the actual activity that caused the contamination; or

   c) arises through an act or activity of a person that results in a change to pre-existing contamination.

2. Without limiting the generality of the duty in subsection (1), the persons on whom subsection (1) imposes an obligation to take reasonable measures, include an owner of land or premises, a person in control of land or premises or a person who has a right to use the land or premises on which or in which-

   a) any activity or process is or was performed or undertaken; or

   b) any other situation exists, which causes, has caused or is likely to cause significant pollution or degradation of the environment.

3. The measures required in terms of subsection (1) may include measures to-

   a) investigate, assess and evaluate the impact on the environment;

b) inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed in order to avoid causing significant pollution or degradation of the environment;

c) cease, modify or control any act, activity or process causing the pollution or degradation;

d) contain or prevent the movement of pollutants or the cause of degradation;

e) eliminate any source of the pollution or degradation; or

f) remedy the effects of the pollution or degradation.

6.3 FAILURE TO COMPLY WITH ENVIRONMENTAL CONSIDERATIONS

Within the provisions of the relevant environmental legislation, there are a number of penalties for non-compliance or offences. Below a few extracts are presented for information purposes, however these must not be read in isolation and the reader is reminded that there are other Acts, or sections of Acts, which may be applicable to the relevant project:

- NEMA Section 49B(1): A person convicted of an offence in terms of section 49A(1)(a), (b), (c), (d), (e), (f) or (g) is liable to a fine not exceeding R10 million or to imprisonment for a period not exceeding 10 years, or to both such fine or such imprisonment- this includes commencing with a listed activity without an EA or the non-compliance with conditions of any EA and associated EMPr;

- NEMA Section 49B(2): A person convicted of an offence in terms of section 49A(1)(i), (j) or (k) is liable to a fine not exceeding R5 million or to imprisonment for a period not exceeding 5 years, and in the case of a second or subsequent conviction to a fine not exceeding R10 million or to imprisonment for a period not exceeding 10 years, and in both instances to both such fine and such imprisonment;

- NEMA Section 49B(3): A person convicted of an offence in terms of section 49A(1)(h), (l), (m), (n), (o) or (p) is liable to a fine or to imprisonment for a period not exceeding one year, or to both a fine and such imprisonment;

- NWA Section 151 (1c): No person may fail to comply with any condition attached to a permitted water use under this Act;

- NWA Section 151 (2): Any person who contravenes any provision of subsection (1) is guilty of an offence and liable, on the first conviction, to a fine or imprisonment for a period not exceeding five years, or to both a fine and such imprisonment and, in the case of a second or subsequent conviction, to a fine or imprisonment for a period not exceeding ten years or to both a fine and such imprisonment;

- NEM:BA Section 102 (1): A person convicted of an offence in terms of section 101 is liable to a fine not exceeding R10 million, or an imprisonment for a period not exceeding ten years, or to both such a fine and such imprisonment;

- NEM:WA Section 68 (1): A person convicted of an offence referred to in section 67(1)(b), (c), (d), (e), (f), (i), (j), (k) or (l) or section 67(2)(a), (b), (c), (d) or (e) is liable to a fine not exceeding R5 000 000 or to imprisonment for a period not exceeding five years, or to both a fine and such imprisonment, in addition to any other penalty or award that may be imposed or made in terms of the National Environmental Management Act;

- NEM:WA Section 68 (2): A person convicted of an offence referred to in section 67(1)(b), (c), (d), (e), (f), (i), (j), (k) or (l) or section 67(2)(a), (b), (c), (d) or (e) is liable to a fine not exceeding R5 000 000 or to imprisonment for a period not exceeding five years, or to both a fine and such imprisonment, in addition to any other penalty or award that may be imposed or made in terms of the National Environmental Management Act;

- NEM:WA Section 68 (3): Any person convicted of an offence referred to in section 67(1)(m) is liable to a fine or to imprisonment for a period not exceeding six months or to both a fine and such imprisonment;

- NEM:WA Section 68 (4): A person who is convicted of an offence in terms of this Act and who persists after conviction in the act or omission that constituted the offence commits a continuing offence and is liable on conviction to a fine not exceeding R1 000 or to imprisonment for a period not exceeding 20 days, or to both such fine and such imprisonment, in respect of each day that person persists with that act or omission.

It is recommended that a procedure for non-compliances (i.e. incentives or disincentives for conformance and non-conformance with the EMPr requirements) must be employed to ensure that the EMPr is adequately implemented. The system to be used must be determined before construction commences, included in the tender documents and contracts, and made clear to all project workers. The system may include that the independent Environmental Control Officer (ECO) can be authorized to impose spot fines on the Contractor and/or his subcontractors for any of the defined transgressions. Such fines should be issued in addition to any remedial costs incurred as a result of non-compliance with the environmental specifications and or legal obligations.

7 ROLES AND RESPONSIBILITIES

The applicant will be responsible for ensuring overall compliance with the provisions of the EMPr. Implementation is the key to the success of the EMPr. In order to ensure that the EMPr and its mitigation measures are implemented, roles and responsibilities need to be clearly defined and documented prior to commencement. This section serves as a guide on which party is normally responsible for certain tasks. Specific roles are designated in the specific environmental management and mitigation requirements in this EMPr.

7.1 THE PROJECT APPLICANT/PROPONENT

The applicant is the principal party (Proponent) of the project. For the purposes of this project it is understood that the Applicant role is fulfilled by the Glencore (Pty) Ltd . The legal accountability for correct implementation of the relevant requirements of the EA and EMPr falls primarily upon the applicant and must therefore be built into all contractor's contractual agreements. The applicant's role typically includes:

- Provide for all necessary supervision during the execution of the project including appointment of key personnel to act on his/her behalf during the construction phase (e.g.: Project Manager). The key personnel will be tasked with ensuring that the various contractors/developers comply with the necessary provisions of the EA and EMPr;
- Ensure that the various contractors and applicable sub-contractors appoint a suitably qualified, competent Environmental Officer (EO) that will be responsible for among others, ensuring daily compliance with the EMPr and EA throughout the construction of the relevant project components;
- Appoint a suitably qualified, competent independent Environmental Control Officer (ECO) who will undertake periodic audits on the various contractors works and/or land parcels under development;
- Notify the relevant competent authority of changes in the development resulting in significant environmental impacts;
- Assess the various contractor's environmental performance during construction, in consultation with the ECO;
- Ensure compliance with regulations;
- To implement the projects as per the approved project plan;
- To ensure that implementation is conducted in an environmentally acceptable manner;
- To comply with special conditions as stipulated by surrounding landowners during the negotiation process (if any); and
- To inform and educate all employees about the environmental risks associated with the different activities that should be avoided during the construction process and lessen significant impacts to the environment.

Therefore, ultimately, the Applicant is responsible for the development and implementation of the EMPr and, where relevant, ensuring that the conditions in the EA are satisfied. Where construction activities are contracted out (e.g. to Contractors and Subcontractors), the liability associated with non-compliance still rests with the Applicant (unless otherwise agreed upon between the authorities, the Applicant and the contracting parties). The Applicant (and not the Contractor) is therefore responsible for liaising directly with the relevant authorities with respect to the preparation and implementation of the EMPr and meeting authorisation conditions.

7.2 THE PROJECT MANAGER

During the development, it is envisaged that there may be a number of contractors and sub-contractors undertaking various activities on the project. The Project Manager would oversee all contractors and sub-contractors from a project management point of view. The roles of the Project Manager typically include the following:

- The Project Manager acts on behalf of the Applicant regarding the administration of contracts to sub-contractors, etc.;
- Provides and/or approves scheduling, aspects of co-ordination and estimating;
- Ensures implementation of the project plan within cost, time and quality constraints;
- Ensures that implementation of EMPr is executed as planned; and
- Keeps the asset owner informed of progress made during the life cycle of the project.

7.3 THE ENVIRONMENTAL CONTROL OFFICER

The ECO is appointed by the Applicant for compliance monitoring and auditing purposes and should be independent from the Applicant and the Contractors. The ECO should have appropriate training and/or experience in the implementation of environmental management specifications. The ECO must preferably have a tertiary qualification in an Environmental Management or appropriate field. The ECO provides feedback to the Project Manager regarding all environmental matters. The ECO's key role is auditing the implementation of the EMPr. For the purposes of implementing the conditions contained herein, the Applicant should appoint the ECO well before the start of construction. The ECO is responsible for the auditing function as well as the clarification of environmental conditions contained in this EMPr to anyone working on the site.

The ECO roles include:

- Recommendations for review and update of the EMPr;
- Liaison between the Applicant, Contractors, authorities and other lead stakeholders on high importance environmental concerns;
- Conducting a pre-construction survey of the site prior to construction;
- Review the site induction training to ensure environmental issues receive adequate attention and important site-specific issues are included;
- Conduct environmental audits of the site/contractors including relevant documentation on a monthly basis;
- Validating the regular site inspection reports, which are to be prepared by the relevant contractor EO's;
- Maintain a record of all non-conformances and incidents to ensure that measures are put in place to remedy such;
- Maintain a public consultation register in which all complaints are recorded, as well as action taken; and
- Verification that all environmental monitoring programmes (sampling, measuring, recording etc. when specified) are carried out according to protocols and schedules.

It is important to note that where opportunity for interpretation occurs within the conditions of this EMPr, the interpretation of the ECO will take preference.

7.4 THE CONTRACTOR

The contractor is usually a third party appointed by the applicant/project manager to undertake the actual construction of the project. In some cases, the development components may also be undertaken by third party developers with their own contractors and sub-contractors. For the purposes of this section, any contractor on site (regardless of who appointed them) is referred to as the "contractor."

The relevant contractors are answerable to the Project Manager and ECO for all environmental issues associated with the project. Contractor performance will, amongst others, be assessed on health, safety and environmental management criteria. The principal contractor/s, any other contractors and sub-contractors will be required to comply with the provisions contained herein, and accordingly, the EMPr and its provisions must form part of any contractual arrangements between the applicant and contractors, and contractors and their sub-contractors, etc. The contractor must comply with EMPr during construction and ensure that all his employees and sub-contractors appointed by him/her are familiar with the EMPr. The legal accountability for correct implementation of the relevant requirements of the EA and EMPr must be contractually bound to the appointed contractor.

The Contractors role includes:

- Provide all necessary supervision during the execution of the project;
- Appoint a suitably qualified, competent EO that will be responsible for amongst others, ensuring daily compliance with the EMPr, EA during the construction phase;
- To implement the projects as per the approved project plan;
- To ensure that implementation is conducted in an environmentally acceptable manner;
- To fulfil all obligations as per the agreed contract;
- To comply with special conditions as stipulated by surrounding Landowners during the negotiation process (if any); and
- Ensure that the Contractors staff and employees have received the appropriate environmental awareness training prior to commencing construction.

7.5 THE ENVIRONMENTAL OFFICER (COMPLIANCE OFFICER)

An Environmental Officer (EO) who is responsible for the on-site implementation of the EMPr shall be appointed. The EO should be suitably qualified and competent to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the ECO and the public. The EO ensures that all Sub contractors working under the main Contractor and sub-contractors abide by the requirements of the EMPr. The appointment of additional EO's and/or sub-contractors EO's is at the ECO's discretion. The costs related to the implementation of the EMPr will be the responsibility of the relevant Contractor/ Sub-contractor.

The EO roles will include:

- Preparing activity based Environmental Method Statements where applicable and where required by the ECO;
- Review the contractors safe work procedures/risk assessments/induction training during the construction phase and include information relating to the relevant environmental risks and appropriate mitigation measures;
- Support the ECO in monitoring by maintaining a permanent presence on site;
- Establishing and maintaining an environmental incident register;

- Taking required corrective action within specified time frame in respect of non-conformances and environmental incidents;
- Assist in finding environmentally acceptable solutions to construction problems;
- Attendance at HSE meetings, toolbox talks and induction programmes (where relevant);
- Inspect the site as required to ensure adherence to the management actions of the EMPr on a regular basis;
- Complete a diary with the purpose of recording environmental issues and corrective measures;
- Report any complaints to the ECO to be captured in the complaints register;
- Liaise with the construction team on issues related to implementation of, and compliance with the EMPr;
- Ensure adequate and compliant waste management; and
- Ensuring that environmental signage and barriers are correctly placed and maintained.

7.6 THE AUTHORITIES

The authorities that should be involved include the Competent Authorities, i.e. North West Department of Economic Development, Environment, Conservation and Tourism (NWDEDECT). The authorities may be required to perform the following roles:

- Review Monitoring and Audit reports, if required;
- Review whether there is compliance by the Applicant and Contractor with the terms of the EMPr and permit/license conditions. Whenever necessary, the authorities should assist the Applicant in understanding and meeting the specified requirements; and
- The authorities may perform random controls to check compliance. In case of persistent non-compliance, the Applicant will be required to provide an action plan with corrective measures, and have it approved by the authorities.

8 ENVIRONMENTAL MANAGEMENT SYSTEM

The purpose of this EMPr is to ensure that the environment is properly considered during the design, construction, operations, and decommissioning, and that negative impacts are minimised or prevented, and positive impacts enhanced. At the same time the EMPr should provide a logical extension of the EIA, specialist studies, or any other technical planning and assessment documentation, to ensure that recommendations are implemented, and that the project does not deviate from the environmental profile that formed the basis of the assessment.

8.1 DOCUMENT CONTROL

A formal document control system should be established. The document control system must provide for the following requirements;

- Documents are approved for adequacy prior to use;
- Review and update documents as necessary and re-approve documents;
- Ensure that changes and the current version status of documents are identified;
- Ensure that relevant versions of applicable documents are available at points of use;
- Ensure that documents remain legible and readily identifiable;
- Ensure that documents of external origin necessary for the EMPr are identified and their distribution controlled; and
- Prevent unintended use of obsolete documents and apply suitable identification to them if they are retained for any purpose.

The responsibility for establishing a suitable document control system rests with the Project Manager.

8.2 RECORD KEEPING

It is essential that an official procedure for control of records be developed to ensure records required to demonstrate conformity to environmental standards are maintained. The Applicant, or the Project manager (if assigned) is therefore required to develop and maintain a procedure for the identification, storage, protection, retrieval, retention and disposal of records as part of the EMPr. Records must be legible, identifiable and traceable.

8.3 AUDITING AND REPORTING PROCEDURES

Reporting procedures must be developed at the start of the project, for conveying information from the compliance monitoring activities and to ensure that management is able to take rapid corrective action should certain thresholds be exceeded. Different reporting procedures may include:

- Inspections;
- Accidents and emergencies;
- Measuring performance indicators and interpreting and acting on the indicators;
- Records of monitoring activities to test the effectiveness of mitigation measures and impact controls, as well as for compliance auditing purposes; and
- Training programmes and evidence of appropriate levels/amount of skills/capacities created.

All monitoring and auditing must be accompanied by applicable records and evidence (e.g. delivery slips, photographic records, etc.). All reports must be retained and made available for inspection by the ECO, the Applicant and /or the Relevant Competent Authorities. All reports shall be signed by the relevant parties to

ensure accountability. The Applicant must use the audit report findings to continually ensure that environmental protection measures are working effectively on site through a system of self-checking. The EMPr should be viewed as a dynamic document aimed at continual environmental performance improvement.

The following auditing and reporting shall be required throughout the construction phase:

- Monthly Compliance Reports (EO): These reports must be prepared by the EO and must aim to provide a concise monthly performance report, including copies of relevant documents (e.g. waste manifests, incident registers, complaints registers, etc);
- Monthly Audit Reports: The ECO must compile monthly compliance reports (audits) which are to be submitted to the Applicant for review and correction of non-compliance issues. It is the responsibility of the ECO to report any non-compliance, which is not correctly rectified. Depending on the outcome of the permitting processes it may be a requirement to submit these to the relevant authorities.

8.4 RESPONDING TO NON-COMPLIANCES

Non-compliance will be identified and managed through the following four key activities including:

- Inspections of the site and activities across the site;
- Monitoring of selected environmental quality variables;
- Audits of the site and relevant documentation as well as specific activities; and
- Reporting on a monthly basis.

An environmental non-conformance and incident register must be prepared and maintained by the ECO throughout the construction phase in order to track and monitor environmental concerns, incidents, and non-conformances. The register must include details of date, location, description of the NC or Incident, applicable environmental commitment/standard, corrective action taken, adequacy of corrective action, date rectified, etc.

Non-compliance with the EMPr or any other environmental legislation, specifications or standards shall be recorded by the ECO in the non-conformance register. This register shall be maintained by the ECO and will be sent to the Applicant and Contractor on a regular basis (monthly), and the Applicant shall ensure that the responsible party takes the necessary corrective actions. Non-conformances may only be closed out in the register by the ECO upon confirmation that adequate corrective action has been taken and/or documented proof provided. The register should be utilised to measure overall environmental performance.

8.5 ENVIRONMENTAL INCIDENCES

For the purposes of this project, an environmental incident can be divided into three levels, i.e. major, medium and minor. All Major and Medium environmental incidents shall be recorded in the ECO's non-conformance and incident register. Minor incidents shall be recorded by the contractor, and by the Applicant (operational phase) in their own incident register. Definitions and examples of environmental incidents are provided in Table 6.

Table 6: Description of incidents and non-conformances for the purpose of the project

Non-Conformance	**Any deviation from work standards, practices, procedures, regulations, management system performance etc. that could either directly or indirectly lead to injury or illness, property damage, damage to the workplace environment, legal transgression or a combination of these.**
Major Environmental Incident	An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in widespread, long-term, irreversible significant negative impact on the environment and/or has a high risk of legal liability.

	A major environmental incident usually results in a significant pollution and may entail risk of public danger. Major environmental incidents usually remain an irreversible impact even with the involvement of long-term external intervention i.e. expertise, best available technology, remedial actions, excessive financial cost etc. Major environmental incidents may be required to be reported to the authorities. The ECO shall make the final decision as to whether a particular incident should be classified as a Major incident. An example of a Major environmental incident would be a significant spillage (e.g. 500 litres) of fuel into a watercourse.
Medium Environmental Incident	An incident or sequel of incidents, whether immediate or delayed, that results or has the potential to result in widespread or localised, short term, reversible significant negative impact on the environment and/or has a risk of legal liability. A medium environmental incident may be reported to the authorities, can result in significant pollution or may entail risk of public danger. The impact of medium environmental incidents should be reversible within a short to medium term with or without intervention. The ECO shall make the final decision as to whether a particular incident should be classified as a Medium incident. An example of a Medium environmental incident would be a large spill of fuel (e.g. >50 litres) onto land.
Minor Environmental Incident	An incident or sequel of incidents, whether immediate or delayed, where the environmental impact is negligible immediately after occurrence and/or once-off intervention on the day of occurrence. An incident where there is unnecessary wastage of a natural resource is also classified as a minor environmental incident. An example would be leaking water pipes that result in the wastage of water. A minor environmental incident is not reportable to authorities. An example of a minor incident is day to day spills of fuel or oil onto the ground where the spill is less than five (5) litres.

The following incident reporting procedures shall apply to this project:

- All environmental incidents shall be reported to the EO, and the ECO, and shall be recorded in the respective incident registers;
- The ECO shall record the incident in the incident register and advise on the appropriate measures and timeframes for corrective action;
- An incident report shall be completed by the relevant party responsible for the incident for all medium and major incidents and the report shall be submitted to the Project Manager and ECO within 5 calendar days of the incident;
- The EO shall investigate all incidents and identify any required actions to prevent a recurrence of such incidents; and
- In the event of an emergency incident (unexpected sudden occurrence), including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed, the Applicant shall notify the relevant authorities in accordance with Section 30(3) of the NEMA. The Applicant shall engage the ECO who shall assess all major incidents and shall advise the Applicant when any such incident must be reported to the authorities as per the above requirement.

9 REVIEW AND REVISION OF THE EMPR

It is important to note that this EMPr is made legally binding on the Applicant through the EA and the approval of the EMPr by the decision-making authority. It is important to consider that the EMPr is a dynamic document which may require such alteration and /or amendment as the project evolves. Conditions under which the EMPr would require revision include:

- Changes in legislation;
- Occurrence of unanticipated impacts or impacts of greater intensity, extent and significance than predicted;
- Inadequate mitigation measures (i.e. where environmental performance does not meet the required level despite the implementation of the mitigation measure);
- Secondary impacts occur as a result of the mitigation measures; and
- Instances where the implementation of the specified management, as a result of changes in circumstances, may become impractical or unreasonable to implement.

The Applicant in consultation with the ECO should be responsible for ensuring that the registration and updating of all relevant EMPr documentation is carried out. It shall be the responsibility of the Applicant, in consultation with the ECO, to ensure that all personnel are performing according to the requirements of the document control procedure, and to initiate the revision of controlled documents, when required by changes in process or operations.

The ECO must undertake a risk assessment of any proposed changes to the EMPr. This risk assessment must be included in the applicable monthly audit report, and where applicable supported by the necessary proof of public consultation. It is important to note that if alterations and/or amendments are required; these may only be affected with written approval from the competent authority and in accordance with the relevant legal processes.

10 ENVIRONMENTAL AWARENESS PLAN AND TRAINING

Training and environmental awareness is an integral part of a complete EMPr. The overall aim of the training will be to ensure that all site staff are informed of their relevant requirements and obligations pertaining to the relevant authorisations, licences, permits and the approved EMPr and protection of the environment.

The applicant and contractor must ensure that all relevant employees are trained and capable of carrying out their duties in an environmentally responsible and compliant manner and are capable of complying with the relevant environmental requirements. To obtain buy-in from staff, individual employees need to be involved in:

- Identifying the relevant risk;
- Understanding the nature of risks;
- Devising risk controls; and
- Given incentive to implement the controls in terms of legal obligations.

The Applicant shall ensure that adequate environmental training takes place. All employees shall have been given an induction presentation on environmental awareness. Where possible, the presentation needs to be conducted in the language of the employees. All training must be formally recorded, and attendance registers retained. The environmental training should, as a minimum, include the following:

- General background and definition of the environment;
- The importance of compliance with all environmental policies;
- The environmental impacts, actual or potential, of their work activities;
- Compliance with mitigation measures proposed for sensitive areas;
- Their roles and responsibilities in achieving compliance with the environmental policy and procedures and with the requirement of the applicant's environmental management systems, including emergency preparedness and response requirements;
- The potential consequences (legal and/or other) of departure from specified operating procedures including fines (where applicable);
- The mitigation measures required to be implemented when carrying out their work activities; and
- All operational risks must be identified, and processes established to mitigate such risk, proactively. Thus, the applicant needs to inform the employees of any environmental risks that may result from their work, and how these risks must be dealt with in order to avoid pollution and/or degradation of the environment.

In the case of permanent staff required during the operational phase of the project, the Applicant / contractor shall provide evidence that such induction courses have been presented. In the case of new staff (including contract labour) the contractor / Applicant shall keep a record of adequate environmental induction training.

The specific requirements for environmental training during the construction phase include:

- Environmental Induction Training: All general workers must receive induction training which shall be presented by the Contractors HSE Manager Representatives. The induction training must include an environmental management component which will be prepared by the EO and presented where possible by the EO. The training material must include general environmental awareness and an overview of the approved EMPr and applicable authorisations, licences and permits. The Induction Training Material must be reviewed and approved by the ECO;

- Monthly Environmental Toolbox Talks will be prepared by the EO to cover a range of environmental topics and must be presented to relevant staff during applicable times during construction process (e.g. at the start of a day or activity). The aim of these toolbox talks will be to inform site employees of general environmental requirements pertaining to specific activities, as well as specific EMPr and EA requirements and obligations. The ECO shall review environmental toolbox talks on a periodic basis to ensure the material is relevant and appropriate;
- Informal training of all staff on site is also required on an on-going basis through informal discussions, on-site supervision and through facilitation of day to day activities. Such training must be given or otherwise facilitated by the EO; and
- The EO must review all safe work procedures/risk assessments/DSTI's (daily safe task instruction) from the Health, Safety, Environmental and Quality (HSEQ) Department and include the relevant environmental risks and appropriate mitigation measures where necessary. Since the above procedures are specific to the applicable activity being undertaken, the inclusion of environmental measures aims to ensure each activity is undertaken in an environmentally responsible manner.

11 EMERGENCY RESPONSE PLAN

The Applicant must identify potential emergencies and develop procedures for preventing and responding to them. There are several options for dealing with high priority impacts and risks, as the paradigm has two components, probability and consequence. The design of control measures rests on understanding the cause and effect. Best practise is to intervene with the ultimate factors where feasible, rather than treat the outcomes. Emergency response therefore has the option of reducing probability or reducing the consequence while reducing the probability is the preferred option. Below are some common emergency preparedness approaches:

- Threat consequence if a risk eventuates, when the risk becomes an issue;
- Combine reducing the probability and treating the consequence;
- Offset environmental losses by investing in other assets;
- Not manage some of the risks because there are too many; and
- Make provision to manage residual impacts or issues that arise because of shortcomings in risk identification and rating, avoidance and mitigation or because a rare event has occurred.

Residual impacts are those impacts that despite reducing the probability and consequence might still occur. In these cases, parties will have to be compensated, pollution cleaned up and damage to the environment remediated.

The Applicant shall be required to develop and implement an Emergency Preparedness and Response Plan prior to commencing work. The Applicant must ensure that the Emergency Preparedness and Response Plan makes provision for environmental emergencies, including, but not limited to:

- Fire Prevention;
- Fire Emergency Response;
- Spill prevention;
- Spill Response;
- Contamination of a water resource;
- Accidents to employees; and
- Use of hazardous substances and materials, etc.

The Applicant and Contractor must ensure that lists of all emergency telephone numbers/contact persons (including fire control) are kept up to date and that all numbers and names are posted at relevant locations throughout the lifespan of the project.

12 SPILL RESPONSE PROCEDURE

The Contractor must ensure that all employees, staff and labourers are informed and instructed regarding implementation of spill prevention measures and spill response procedures. In the event of a spill, the following general requirements shall apply, and the detailed spill procedure must cater for these requirements:

- Immediately reporting of spills by all employees and/or visitors to the relevant supervisor and EO (this requirement must be including in induction training);
- Take immediate action to contain or stop the spill where it is safe to do so;
- Contain the spill and prevent its further spread (e.g. earth berm or oil absorbent materials for spill to land or by deploying booms and/or absorbent material for a spill to water);

- Dispose of any contaminated soil or materials according to appropriate waste disposal procedure. Note: Waste from spills of hazardous materials shall be disposed of as hazardous waste at a suitably licensed waste disposal facility;
- The EO shall record details of the spill in their respective incident registers;
- Photographic evidence shall be obtained of the spill clean-up.

In the case of large spills, the services of a specialist spill response agency shall be required, who shall advise on appropriate clean-up procedures and follow-up monitoring (if required). The incident procedures as defined in Section 8.5 shall also apply.

The Applicant must also, (as per Section 30 of the NEMA) notify the Director-General (DHSWS, Competent Authority, DEFF), South African Police Services, Provincial Environmental Authority, the Local Municipality, and any persons whose health may be affected of the nature of an incident including:

- Any risks posed to public health, safety and property,
- Toxicity of the substance or by products released by the incident and
- Any step taken to avoid or minimise the effects of the incident on public health and the environment

13 MEASURES TO CONTROL OR REMEDY ANY CAUSES OF POLLUTION OR DEGRADATION

The broad measures to control or remedy any causes of pollution or environmental degradation as a result of the proposed activities taking place on the project are provided below:

- Limit the size of the area to be disturbed as far as is practically possible;
- Ensure that the environmentally sensitive areas are adequately demarcated throughout the construction phase;
- Ensure topsoil, subsoil and rock dumps are provided with adequate storm water runoff measures;
- Contain potential pollutants and contaminants (where possible) at source;
- Handling of potential pollutants and contaminants (where possible) must be conducted in bunded areas and on impermeable substrates;
- Ensure the timeous clean-up of any spills;
- Implement a waste management system for all waste streams present on site;
- Investigate any I&AP claims of pollution or contamination as a result of the project activities; and
- Rehabilitate the site in line with the requirements of the rehabilitation plan

14 MANAGEMENT AND MITIGATION

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	**Technical or Management Option**	**Phase**	**Timeframes**	**Responsible Party**	**Monitoring Party (Frequency)**	**Target**	**Performance Indicators (Monitoring Tool)**
14.1 LEGAL COMPLIANCE							
A	The Applicant shall identify and comply with all relevant national, provincial and local legislation, including associated regulations and bylaws and shall establish and maintain procedures to keep track of, document and ensure compliance with environmental legislative changes.	Planning Construction Operation Decommissioning	Prior to construction and ongoing	Applicant	Third party legal compliance audit conducted by external service provider every three (3) years.	Ensure compliance with relevant legislation.	Up to date legal register. (Legal register) Third Party Legal Audit (Isometrix)
B	Should there be changes in legislation and/or regulations the Applicant shall take the necessary actions to incorporate such changes and to pass these requirements on to the Contractors.	Planning Construction Decommissioning	Prior to construction and ongoing throughout construction	Applicant ECO	EO (Monthly)	Ensure compliance with relevant legislation / Confirmation that requirements in terms of updated legislation are passed onto the contractors.	(Contractors contractual agreements) Legal Register
C	Glencore must complete the relevant obstacle assessment and obtain approval from ATNS for the PV project prior to construction commencing.	Planning	Prior to construction	Applicant	Applicant (once off prior to construction)	Obtain approvals prior to construction commencing	Legal register

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
14.2 APPOINTMENT OF ECO							
A	The Applicant shall appoint a suitably qualified ECO who shall be independent from the Applicant and the Contractor. The ECO must preferably have a tertiary qualification in Environmental Management or appropriate environmental science field. The ECO should have appropriate qualification and experience in the implementation of environmental management specifications. For the purposes of implementing the conditions contained in this EMPr. The Applicant shall provide the ECO with the necessary support to ensure that the environmental aspects relating to the development is adhered to. The appointment of the ECO shall remain in force until all obligations of this EMPr have been met (e.g. including rehabilitation phase).	Planning Construction	Prior to construction	Applicant	Applicant (once off prior to construction)	Appoint ECO to ensure monitoring of successful implementation of the EMPr.	Confirmation that ECO has been appointed and is suitably qualified to perform the duties contained in this EMPr. (ECO appointment and CV)
B	The Applicant is responsible for the maintenance, update and review of the EMPr. The ECO shall for as long as they are appointed, include any recommendations for proposed amendments/alterations of the EMPr to the Applicant who shall engage the	Construction	As required	Applicant ECO	ECO (Monthly) Applicant (as and when necessary)	Ensure EMPr is reviewed and updated where necessary to ensure adequate mitigation for all impacts associated with the project.	Audit results and recommendations (ECO Monthly Audit)

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	competent authority, to the extent required, with regards to such changes.						
	14.3 APPOINTMENT OF CONTRACTORS						
A	The EMPr must be made binding on the contractor/s and should be included in tender documentation and contracts. The costs related to the implementation of the EMPr during construction must be provided for in the contract.	Construction	Prior to construction and ongoing during construction	Applicant Contractors	ECO (Once-off at the start of individual contractor's work)	Ensure that the contractor is in possession of the EMPr and that they understand their obligations thereto.	Confirmation that contractor has received EMPr, and that EMPr has been made contractually binding. (Contractual agreements) (ECO Monthly Audit)
B	All contractors and sub-contractors must have a copy of this EMPr on site and should be briefed with regards to compliance with the EMPr.	Construction	Prior to construction and ongoing during construction	Applicant Contractor	ECO (Once off per contractor) Applicant (Once off per contractor)	Ensure all contractors are aware of EMPr requirements.	Confirmation that contractors have received training relating to EMPr implementation. (Training records) (ECO Monthly Audit)
C	A dedicated EO shall be appointed. The EO must be suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the ECO and the public. The EO	Construction	Prior to construction	Contractor	ECO (Once-off at the start of the construction phase)	Ensure a suitably qualified EO is present on site to oversee day to day activities and ensure successful	Confirmation that EO has been appointed and is suitably qualified to perform the necessary duties

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	shall be appointed prior to the onset of construction works.					implementation of EMPr during construction.	contained in this EMPr.
D	The Contractor shall ensure that all sub-contractors working under them abide by the requirements of the EMPr through the inclusion of the EMPr and applicable environmental requirements in contractual agreements for all sub-contractors.	Construction	Ongoing	Contractor	EO (Monthly) ECO (Monthly)	Ensure that the contractor implements all the mitigation measures as described in the EMPr.	Signed declaration of understanding by contractors (EO monthly reports) (ECO Monthly Audit Report)
	14.4 SAFETY AND TRAFFIC MANAGEMENT						
A	Compliance with the Mine Health and Safety Act (Act No. 29 of 1996 - MHSA) and associated regulations; That all construction vehicles using public roads are in a roadworthy condition, that they adhere to the speed limits and that their loads are secured and that all local, provincial and national regulations are adhered to; Ensure that all accidents and incidents pertaining to safety are recorded and reported to the Project Manager; The Applicant and Contractor must ensure that he/she has the contact details of the nearest emergency rooms	Construction	Ongoing	Project Manager Contractor	HSEQ Department (Weekly)	Ensure compliance with legal provisions of MHSA.	Incident Reports

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	(hospitals) to the site, of both private and public hospitals.						
B	The speed limit on private/ unregulated roads (access roads) of haul trucks should be limited as per traffic management plan and all traffic rules on regulated roads should be adhered to.	Construction	Ongoing	Project Manager Contractor	HSEQ Department (Weekly)	Ensure compliance with legal provisions of MHSA.	Incident Registers
C	Employees must be made aware of their specific responsibilities in terms of the environmental impacts i.e. controlling noise levels, reducing dust, etc. Employees must be made aware that no alcohol/drugs are allowed on site and no workers under the influence are permitted on site.	Construction	Ongoing	Project Manager Contractor	HSEQ Department (Weekly)	Ensure compliance with legal provisions of MHSA.	Employee induction Toolbox talk records
D	Employees must be made aware that no fires will be allowed. The required PPE shall always be worn on site. Access to the site should be controlled.	Construction	Ongoing	Project Manager Contractor	HSEQ Department (Weekly)	Ensure compliance with legal provisions of MHSA.	Employee induction Toolbox talk records Clocking Records
E	No person shall be allowed to stay on the site after working hours, except for any security that might be patrolling at night.	Construction	Ongoing	Project Manager Contractor	HSEQ Department (Weekly)	Ensure compliance with legal provisions of MHSA.	Clocking Records

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
F	The applicant/ contractor must ensure that regular users of the nearby roads are not unreasonably delayed due to construction activities.	Construction	Ongoing	Project Manager Contractor	HSEQ Department (Weekly)	Ensure compliance with legal provisions of MHSA.	Visual observation of traffic management for vehicles onsite MOC
G	Appropriate signage and barriers must be provided for open trenches and other dangerous/ hazardous locations on site where deemed necessary. The applicant should ensure that a maintenance plan is prepared for the road and associated structures.	Construction	Ongoing	Contractor	HSEQ Department (Weekly) ECO (Monthly)	No incidents as a result of un-barricaded or un-marked hazards. Ensure safety of road users and surrounding communities.	Incident registers Visual observation of signage and barriers around open trenches ECO Monthly Audit Report
14.5 EMERGENCY RESPONSE / DISASTER MANAGEMENT PLANNING							
A	Develop and implement an Emergency Preparedness and Response Plan (EPRP) for implementation during the construction phase. This should be revised periodically as the various phases of the construction work takes place.	Construction	Prior to construction. Ongoing Implementation during construction phase	Contractor	ECO (Once-off at the start of construction activities)	Ensure emergency preparedness and response systems in place.	Verification that EPRP is in place.

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
14.6 ENVIRONMENTAL AWARENESS TRAINING							
A	All personnel and contractors to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof.	Construction Operational	Ongoing during construction	Applicant Contractor	ECO (Periodically when Environmental Awareness Trainings are undertaken)	Ensure that all personnel and visitors are sensitised to the environmental aspects which should be complied with.	Environmental Awareness Training Registers
14.7 FIRE PREVENTION							
A	The Applicant, Contractor and ECO shall assess the risk of fires and where required the relevant party shall ensure that fire breaks are created prior to the onset of construction. Fires breaks must be maintained as necessary to ensure they remain effective. Relevant firefighting equipment is to be provided in relevant locations as per the Safety Specifications on site. The equipment must be serviced at the required intervals.	Construction	Prior to construction and ongoing during construction	Applicant Contractor	HSEQ Department (Weekly) ECO (Monthly)	Protect site and adjacent properties from runaway fires.	Verification that appropriate fire prevention measures and response plans are in place where required.
14.8 HERITAGE/ PALAEONTOLOGICAL FEATURES							
A	If unearthed, under no circumstances shall any heritage, archaeological or paleontological artefact/ feature be removed, destroyed or interfered with by	Construction	When triggered	Applicant Project Manager	ECO (Monthly, only when condition is triggered)	To ensure compliance with	Implementation of the chance find procedure.

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	anyone on the site, unless such removal has been authorised by the heritage authorities. Implement a chance find procedures in case of possible heritage finds are uncovered. If fossil remains are discovered during any phase of construction, either on the surface or exposed by excavations the Chance Find Protocol must be implemented by the ECO/site manager in charge of these developments. These discoveries ought to be protected (if possible, in situ) and the ECO/site manager must report to SAHRA.			Contract	EO (Monthly, only when condition is triggered)	the requirements of the NHRA.	Heritage impact procedure
B	The possibility of stillborn burials around the structures LS001 and LS002 must be considered. As per African custom stillborn children are buried against the outside wall/foundation or inside the house. The structures (LS001 and LS002) must then be provisionally grade as Grade IIIA in regard to burials. As per SAHRA guidelines, all burial grounds and graves should be retained and avoided with a buffer zone of 30m. If this is not possible, the graves could be relocated after completion of a detailed grave relocation process that includes a thorough stakeholder engagement component, adhering to the requirements of s36 of the NHRA and its regulations as well as	Planning Pre-construction	Once off during planning phase	Applicant Heritage Specialist	ECO (Once off at the start of construction activities)	To ensure compliance with the requirements of the NHRA.	Permit received from SAHRA if relocation is required

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	the National Health Act and its regulations.						
D	Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or paleontological artefacts as set out in the NHRA (Act No 25 of 1999) Section 51 (1).	Construction,	Ongoing	Project Manager Contractor	ECO (Once off)	To ensure compliance with the requirements of the NHRA.	Environmental Awareness Training to include heritage aspects. Registers
14.9 TERRESTRIAL FLORA AND AQUATIC ECOLOGY							
A	Areas of indigenous vegetation, even secondary vegetation communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible.	Construction Operational	Construction phase	Contractor Applicant	EO (Annually during operational phase) ECO (Monthly during construction phase)	Limit disturbance to flora onsite..	Visual confirmation of compliance with EMPr conditions. Annual Compliance Audit HSEQ weekly checklist) (ECO Monthly Audit during construction)
B	Where possible, existing access routes and walking paths must be made use of.	Construction Operational	Ongoing	Contractor Applicant	EO (Annually during operational phase) ECO (Monthly during construction phase)	Limit disturbance to flora onsite..	Visual confirmation of compliance with EMPr conditions. Annual Compliance audit.

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
							Traffic Management Plan HSEQ weekly checklist)
C	All laydown, chemical toilets etc. should be restricted to low sensitivity areas. Any materials may not be stored for extended periods of time and must be removed from the project area once the construction/closure phase has been concluded. No storage of vehicles or equipment will be allowed outside of the designated project areas.	Construction	Ongoing	Project Manager Design Engineer	HSEQ (Weekly) ECO (Monthly)	Limit disturbance to flora on site..	Visual confirmation of compliance with EMPr conditions. Annual Compliance audit Traffic management plan
D	Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood and wind events. This will also reduce the likelihood of encroachment by alien invasive plant species.	Construction Operational	Quarterly for up to two years after the closure	EO Contractor	EO (Monthly during construction and annually during the operational phase) ECO (Monthly during construction phase)	Limit disturbance to flora on site.	Visual confirmation that denuded areas which have not been affected by construction i.e.. laydown areas are rehabilitated sufficiently Annual Compliance audit Post construction rehabilitation plan

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
E	Any woody material removed can be shredded and used in conjunction with the topsoil to augment soil moisture and prevent further erosion.	Construction Operational Decommissioning	During Phase	HSEQ Department (Weekly) Contractor	EO (Monthly during construction. and decommissioning phases) ECO (Monthly during construction phase)	Limit disturbance to flora on site..	Visual confirmation of compliance with EMPr conditions.
F	A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it 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. 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. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. Appropriately contain any generator diesel storage tanks, machinery spills (e.g., accidental spills of hydrocarbons oils, diesel etc.) in such a way as to prevent them leaking and entering the environment.	Operational	Ongoing	Contractor	EO (Annually)	Limit disturbance to flora on site.	Visual confirmation of compliance with EMPr conditions. Emergency Response plan. Annual compliance audit

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
G	A carefully considered surface water/drainage management plan must be developed for the site including attention to the use of environmentally friendly cleaning chemicals for cleaning of panels during the operational phase. Where possible minimise the use surfactants to clean solar panels and herbicides to control vegetation beneath the panels. If surfactants and herbicides must be used do so well prior to any significant predicted rainfall events.	Operational	Ongoing	EO Design Engineer	EO (Annually)	Limit disturbance to flora on site.	Visual confirmation of compliance with EMPr conditions. Annual Compliance audit Stormwater Management Plan
H	It should be made an offence for any staff to take/ bring any plant species into/out of any portion of the project area. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants.	Operational	Ongoing	Project manager, EO	EO (Annually)	Limit disturbance to flora on site	Visual confirmation of compliance with EMPr conditions. Annual compliance audit Invader specie removal plan
I	An emergency response plan needs to be developed to address fire hazards and implemented to restrict the impact fire might have on the surrounding areas.	Operational	During Phase	EO Contractor	EO (Annually)	Limit disturbance to flora on site.	Visual confirmation of compliance with EMPr conditions. Emergency preparedness response Annual compliance

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
J	Rocks removed in the construction phase may not be dumped but can be used in areas where erosion control needs to be performed.	Construction	During Phase	Contractor	ECO (Monthly during the construction phase)	Limit disturbance to flora on site	Visual confirmation of compliance with EMPr conditions. (ECO Monthly Audit)
K	The Solar panel surfaces may not have reflective surfaces which can lead to veld fires	Planning	Ongoing	Contractor	EO (Once off during planning phase)	Limit disturbance to flora on site.	Design specification
L	Avoid excessively compacting the ground beneath the solar panels. A covering of soil and grass (regularly cut and maintained) below the solar panels is ideal for infiltration. If not feasible then gravel is preferable over concrete or paving.	Planning	Ongoing	Contractor	EO (Once off during planning phase)	Limit disturbance to flora on site.	Visual confirmation of compliance with EMPr conditions. (ECO Monthly Audit)
M	Develop and implement a rehabilitation and closure plan and appropriately rehabilitate the project area by ripping, landscaping and re-vegetating with locally indigenous species.	Decommissioning	During Phase	Applicant Contractor	EO (Once-ff during decommissioning)	Rehab and closure plan in place and implemented	Closure plan
14.10 FAUNA AND AVIFAUNA							
A	The areas to be developed must be specifically demarcated to prevent movement of staff or any individual into the surrounding environments, Signs	Construction Operational	Ongoing	Contractor	EO (Monthly) ECO (Monthly)	Ensure that activity does not disturb fauna species onsite.	Visual observation of compliance onsite.

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	must be put up to enforce this. High sensitivity areas must be avoided for the PV development while the gridline might span these areas and no pylon may be placed in them.						Fence
B	Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to amphibian species and nocturnal mammals.	Construction Operational	Ongoing	Contractor	EO (Monthly during construction) EO (Once off during operational) ECO (Monthly)	Ensure that activity does not disturb fauna species onsite.	Visual observation of compliance onsite. Once off ambient noise survey during the operational phase.
C	No trapping, killing, or poisoning of any wildlife is to be allowed Signs must be put up to enforce this. All personnel should undergo environmental induction with regards to avifauna and in particular awareness about not harming, collecting, or hunting terrestrial species, and owls, which are often persecuted out of superstition. Signs must be put up to enforce this.	Operational	Ongoing	Contractor	EO (Once off)	Ensure that construction personnel do not interfere with wildlife species onsite.	Visual observation of compliance onsite. Toolbox talk / Induction
D	Facility lighting during construction & operation should be kept to a minimum and should make use of latest technology to ensure that light disturbance is minimised. This will also reduce the	Construction Operational	Ongoing	Contractor EO	EO (Once off during operation phase to verify)	Ensure that activity does not disturb wildlife species onsite.	Visual observation of any lighting used onsite such as LED lighting.

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	attraction of insects (and in turn insectivorous birds) to the facility Outside lighting should be designed and limited to minimize impacts on fauna. All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights should be used wherever possible.				ECO (Monthly – during construction)		Annual Compliance audit
E	Speed limits must still be enforced to ensure that road killings and erosion is limited.	Operational	Ongoing	Applicant	EO (Annually)	Reduce erosion and road kills.	Annual Compliance audit
F	Schedule activities and operations during least sensitive periods, to avoid migration, nesting and breeding seasons, where feasible.	Construction	Ongoing	Applicant	EO (Once off)	Ensure minimal disturbance to fauna.	Confirmation that activities take place during the day in the case.
G	All areas to be developed must be walked through prior to any activity to ensure no nests or fauna species are found in the area. Should any Species of Conservation Concern not move out of the area, or their nest be found in the area a suitably qualified specialist must be consulted to advise on the correct actions to be taken.	Construction	Ongoing	Contractor	EO (Once off before commencement of activities in new areas)	Enable rescuing of existing faunal species.	Visual observation of compliance onsite. Monthly ECO Reports Environmental inspection reports Annual Compliance Audit

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
H	Any holes/deep excavations must be dug and planted in a progressive manner; Should the holes be left overnight they must be sloped so that small fauna can exit.	Construction	Ongoing	Contractor EO	EO (Monthly) ECO (Monthly)	To ensure the protection of faunal species existing onsite.	Visual observation of compliance onsite. Environmental inspection
I	Ensure that cables and connections are insulated successfully to reduce electrocution risk. Any exposed electrical wiring parts must be covered (insulated) to reduce electrocution risk.	Construction	Ongoing	Contractor	ECO (Monthly)	To ensure the protection of faunal species existing onsite.	Visual observation of compliance onsite. COC – upon completion
J	Wildlife-permeable fencing with holes large enough for mongoose and other smaller mammals should be installed, the holes must not be placed in the fence where it is next to a major road as this will increase road killings in the area.	Planning Construction	Once off	Contractor	EO and ECO (Once off at the start of construction	Reduce the impact of road kills.	Visual observation of compliance onsite.
K	Fencing mitigations: • Top 2 strands must be smooth wire • Routinely retention loose wires • Minimum 30cm between wires • Place markers on fences	Construction	Once off prior to commencement of construction	Contractor	ECO (Once of at prior to construction activities)	Ensure movement of fauna around sites with ease	Visual observation of compliance onsite.

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
L	Bird Flappers and diverters must be placed along the whole powerline route, this must be done at 5 m intervals. Overhead cables/lines must be fitted with industry standard bird flight diverters in order to make the lines as visible as possible to collision-susceptible species. Shaw et al (2021) demonstrated that large avifauna species mortality was reduced by 51% (95% CI: 23–68%). Recommended bird diverters such as flapping devices (dynamic device) and thickened wire spirals (static device) that increase the visibility of the lines should be fitted 5 m apart. The Inotec BFD88 bird diverter is highly recommended due to its visibility under low light conditions when most species move from roosting to feeding sites.	Construction	During construction	Applicant Contractor	ECO (Once of at start construction activities)	Mitigation in place once powerline construction is compete	Visual observation of compliance onsite. Annual Compliance audit
M	The design of the proposed transmission line must be of a type or similar structure as endorsed by the Eskom-EWT Strategic Partnership on Birds and Energy, considering the mitigation guidelines recommended by Birdlife South Africa (Jenkins et al., 2017). Any OHLs must be of a design that minimizes electrocution risk by using adequately insulated 'bird friendly' monopole structures, with clearances between live components of 2 m or greater. Ensure that the phase	Construction	During construction	Applicant Contractor	ECO (Once of at start construction activities)	Mitigation in place once powerline construction is compete	Visual observation of compliance onsite. Annual Compliance audit

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	cables are spaced far enough apart to reduce the risk of large birds, such as vultures, touching both simultaneously (2 m or greater) (Prinsen et al., 2012). If such separation (isolation) cannot be provided, exposed parts must be covered (insulated) to reduce electrocution risk.						
N	All the parts of the infrastructure must be nest proofed and anti-perch devices placed on areas that can lead to electrocution	Construction	Technology in place prior to construction	Applicant Contractor	ECO (Once of at start construction activities)	Mitigation in place once powerline construction is compete	Visual observation of compliance onsite. Annual Compliance audit
O	Post-construction monitoring should follow the BirdLife South Africa best practice guidelines for solar energy facilities (BirdLife South Africa, 2017). If monitoring results indicate excessive bird fatalities, then adaptive mitigations should be implemented. Before implementation, these should be discussed with the avifaunal specialist and ECO and could include the retrofitting/incorporation of additional visual cues/diverters to existing PV panels/infrastructure. This is especially	Operations	Post-construction	Applicant Specialist	EO (Monthly)	Monitoring during operations	Monitoring reports

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	pertinent based on the possible occurrence of SCC such as vultures.						
	14.11 ALIEN VEGETATION						
A	The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Footprint of the roads must be kept to prescribed widths.	Construction	Ongoing	Project manager Contractor EO	EO (Monthly) ECO (Monthly)	Ensure that the construction area is clearly visible to construction workers and reduce disturbance of the surrounding environmentally sensitive areas.	Visual observation of construction footprint in comparison to the prescribed widths. Traffic Management plan
B	An alien management plan must be implemented quarterly for 2 years after construction phase.	Post-Construction	Quarterly for up to two years post construction .	Project manager Contractor	EO (Annually)	Control alien the introduction and spread of invasive plants onsite.	Alien vegetation management plan and implementation onsite. Annual Compliance Audit
	14.12 EROSION AND STORMWATER CONTROL						
A	• Speed limits must be put in place to reduce erosion. • Reducing the dust generated by the listed activities above, especially the earth moving machinery, through wetting the soil surface and putting	Operational	Ongoing	Project Manager Contractor EO	EO (Annually)	Ensures that erosion is controlled.	Visual observation of erosion protection measures onsite. Speed limit signage

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	up signs to enforce speed limit .Signs must be put up to enforce this						
B	Where possible, existing access routes and walking paths must be made use of.	Operational	Ongoing	Project Manager Contractor	EO Annually	Ensures that erosion is controlled.	Visual observation of erosion protection measures onsite. Traffic Management plan
C	Land clearing and preparation may only be undertaken immediately prior to construction activities and within authorised areas. Where practicable areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events and strong winds.	Operational	Ongoing	Project Manager Contractor EO	EO (Annually))	Ensures that erosion is controlled.	Visual observation of erosion protection measures onsite and re-vegetation.
D	A stormwater management plan must be compiled and implemented. Stormwater leaving the site should not be concentrated in a single exit drain but spread across multiple drains around the site each fitted with energy dissipaters (e.g. slabs of concrete with rocks cemented in).	Operational	Ongoing	Applicant Contractor EO	EO (Annually))	Ensures that erosion is controlled.	A detailed SWMP Visual observation of stormwater management measures onsite.

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
14.13 AIR QUALITY/DUST							
A	• Dust-reducing mitigation measures must be put in place and must be strictly adhered to. This includes wetting of exposed soft soil surfaces. • No non environmentally friendly suppressants may be used as this could result in pollution of water sources • Reduction of vehicle speeds on unpaved roads.	Construction	Construction (ongoing)	Applicant Contractor	EO (Monthly) ECO (Monthly)	Ensure that no excessive dust or air quality impacts are perceived	Visual confirmation of compliance with EMPr conditions. ((ECO Monthly Audit) Dust Fallout reports Annual compliance audit
14.14 NOISE							
A	• Noise-generating activities associated with construction activities should be kept to a minimum. • Ensure that all construction vehicles and equipment are in a good working condition as to not generate unnecessary noise.	Construction Decommissioning	Construction (ongoing)	Applicant Contractor	EO (Monthly) ECO (Monthly)	Ensure that noise levels are controlled within acceptable limits. No complaints relating to noise.	Confirmation that noise levels are within acceptable limits and relevant notifications undertaken Complaints register
	• The provisions of the South African National Standards (SANS) 10103 (The measurement and rating of environmental noise with respect to annoyance and to speech	Construction Decommissioning	Through project	Applicant Contractor	ECO (Monthly during construction)	Ensure that noise levels are controlled within acceptable limits.	Confirmation that noise levels are within acceptable limits and relevant

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	communication), must be complied with. • The Environment Conservation Act (Act 73 of 1989) (ECA), Section 25 of the Act and the Noise Regulations (GNR 154 of 1992) promulgated under this section, are still in effect. These regulations serve to control noise and general prohibitions relating to noise impact and nuisance. These regulations need to be complied with.						notifications undertaken
14.15	VISUAL						
A	• As far as possible, opt for low-profile solar panel mounting systems to minimise the height and visual intrusion of the panels. Use non-reflective materials for infrastructure to reduce the visual contrast with the surrounding environment. • Choose colours for infrastructure that blend with the natural landscape, reducing visual contrast	Construction	During construction	Applicant Contractor	ECO (Monthly during construction)	Ensure that visual intrusion is minimized as far as possible	Visual inspection Complaints register
B	• Introduce landscaping efforts post-construction to help the facility blend more seamlessly with the surrounding environment. • Regularly maintain the facility and the surrounding landscape to ensure that it remains in good condition and blends in with the natural	Construction Operation	Construction Operation	Applicant Contractor	ECO (Monthly during construction)	Ensure that visual intrusion is minimized as far as possible	Visual inspection Complaints register

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	environment. This includes maintaining the vegetation used for screening and ensuring that the solar panels remain clean and in good condition.						
C	• Use shields on lights to direct illumination to the intended areas and prevent light spill into unintended areas.	Construction Operation	Throughout operations	Applicant Contractor	EO (Monthly) ECO (Monthly)	Ensure that visual intrusion is minimized as far as possible	Visual inspection Complaints register
D	• Ensure that staff are aware of the importance of minimising light pollution and are trained to use lighting efficiently.	Construction Operation	Throughout operations	Applicant Contractor	EO (Monthly) ECO (Monthly)	Ensure that visual intrusion is minimized as far as possible	Visual inspection Complaints register
14.16 SITE ACCESS, SECURITY AND TRAFFIC MANAGEMENT							
A	Access to the site must be controlled to restrict unauthorised personnel from entering the site. Only authorised personnel shall be allowed on site.	Construction	Ongoing	Applicant Contractor	HSEQ Department (Weekly)	Site access control in place	Visual confirmation of site access control. Presence of security controlling access onsite. Access Control
B	• The extent of the working areas must be clearly demarcated prior to commencement. Construction	Construction	Ongoing	Applicant Contractor	EO (Monthly) ECO (Monthly)	Minimise footprint of environmental impact.	Visual observation of vehicle access.

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	activities outside of the demarcated areas must be avoided. • On-site vehicles must be limited to approved access routes and areas (including turning circles and parking) on the site so as to minimise excessive environmental disturbance to the soil and vegetation, and to minimise disruption of traffic.						(ECO Monthly Audit) Traffic management plan Annual Compliance audit
C	No person will be allowed to keep or use alcohol, recreational drugs, traditional or modern weapons, snares or otherwise dangerous objects on-site, or to enter the site while under the influence of alcohol or drugs.	Construction	Ongoing	Applicant Contractor Security	HSEQ Department (Weekly) ECO (Monthly)	Ensure safety and security is maintained on site.	Access control.
D	Staff, employees and construction workers will not be allowed to keep (or have in their possession at any point in time) any animals, including livestock, poultry, wildlife or pets on site.	Construction	Ongoing	Applicant Contractor	EO (Monthly) ECO (Monthly)	Avoid public nuisance, introducing foreign species/diseases to area and unsanitary conditions.	Access control
14.17 HAZARDOUS SUBSTANCE MANAGEMENT							
A	• All hazardous substances (e.g. fuel, grease, oil, brake fluid, hydraulic fluid) must be handled, stored and disposed of in a safe and responsible manner (in accordance with relevant MSDS) to prevent pollution of the	Construction Operational	Ongoing	Applicant Contractor	EO (Monthly) ECO (Monthly)	Appropriate hazardous storage to reduce potential for pollution of environment.	Visual observation that hazardous substance storage complies with EMPr requirements

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	environment or harm to people or animals. • Appropriate measures must be implemented to prevent spillage and appropriate steps must be taken to prevent pollution in the event of a spill. • Have action plans on site, and training for contactors and employees in the event of leaks and hazardous chemical spills to the surrounding environment.						and relevant norms and standards. Annual compliance audit MSDS Training records Emergency response procedure
B	• Hazardous storage areas shall be bunded (impermeable) with adequate containment (at least 110% the largest volume stored) for potential spills or leaks. • Bunded storage areas shall be provided with an oil separator or sump where applicable. Waste from spillages shall be removed and recycled or disposed of responsibly.	Construction Operational	Ongoing	Applicant Contractor	EO (Monthly during operational phase) ECO (Monthly during construction phase)	Adequate provision for spill prevention and containment	Visual observation that storage facilities comply with EMPr requirements and relevant norms and standards.
14.18 POLLUTION PREVENTION							
A	• All dumping of waste material, especially bricks and contaminated materials or soils, must be prevented.	Construction Operational	Ongoing	Applicant Contractor	EO (Monthly) ECO (Monthly during construction)	Limit leaks and spills that can pollute the environment	Visual inspection of waste storage areas to ensure that it complies with EMPr requirements.

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
B	• Equipment used during construction must be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid. • All fuel driven equipment must be inspected regularly to ensure that it is in good working condition, clean, and free from leaks of oil, petrol, diesel, hydraulic fluid and contaminating substances. • Any equipment that may leak, and does not have to be transported regularly, shall be placed on watertight drips trays to catch any potential spillages of pollutants.	Construction	Ongoing	Applicant Contractor	EO (Monthly) ECO (Monthly)	Limit leaks and spills that can pollute the environment.	Visual inspection of plant and equipment that it complies with EMPr requirements.
C	• Avoid the use of material with pollution causing potential where possible.	Construction	Ongoing	Applicant Contractor	EO (Monthly) ECO (Monthly)	Limit leaks and spills that can pollute the environment.	(EO monthly checklist) (ECO Monthly Audit)
D	• Clean up any spillages (e.g. oil, fuel), immediately. Remove contaminated soil and dispose of it appropriately. • Accidental oil and fuel spillages should be cleaned up immediately by the Contractor, placed in sealed containers and disposed of at a licensed waste disposal site.	Construction	Ongoing	Applicant Contractor	EO (Weekly) ECO (Monthly)	Limit leaks and spills that can pollute the environment.	Visual inspections to ensure that spills are cleaned out properly Incident reporting Incident register Isometrix Emergency Response plan)

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
							Waste Management Procedure
E	• The drip trays shall be of an adequate size to collect and contain potential spills. • Daily inspections shall be carried out to ensure such spill prevention measures are in place and remain effective. • Drip trays shall be cleaned regularly and shall not be allowed to overflow.	Construction	Ongoing	Applicant Contractor	EO (Monthly) ECO (Monthly)	Adequate spill prevention measures to avoid pollution of the environment	Visual observation that drips trays are present and utilised. (EO Monthly checklist) (ECO Monthly Audit)
F	• All spilled hazardous substances must be collected and adequately disposed of at a suitably licensed facility. • Hazardous and chemical wastes (includes old containers) should be disposed of at registered landfill sites. • Accidental oil and fuel spillages should be cleaned up immediately by the Contractor, placed in sealed containers and disposed of at a licensed waste disposal site.	Construction	Ongoing	Applicant Contractor	EO (Monthly) ECO (Monthly)	Adequate spill prevention measures to avoid pollution of the environment	Hazardous waste disposal slips
G	An emergency plan should be in place in the event of accidental spillages of hazardous chemicals (petrol and oil) and sewage which could potentially pollute surface and groundwater.	Construction Operational	Ongoing	Applicant Contractor	EO (Monthly) ECO (Monthly during construction phase)	Avoid effluent pollution and water quality degradation of groundwater	Visual observation Site Plans Emergency Response plan

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
H	The mixing of cement should not take place directly on the ground. Cement must be mixed in a designated area on a liner away from water sources and buffers and that successful rehabilitation of the construction areas can take place.	Construction	Ongoing	Applicant Contractor	EO (Monthly) ECO (Monthly)	Limit spills that can pollute the environment.	Visual observations Mixing trays for cement mixes, bunded concrete areas for concrete mixing. (EO monthly checklist) (ECO Monthly Audit)
I	Vehicles and construction equipment should not undergo maintenance procedures on construction site; unless under emergency situations.	Construction Operational	Ongoing	Applicant Contractor	EO (Monthly during construction phase) ECO (Monthly during construction phase)	Limit spills that can pollute the environment.	Visual observation of compliance with this EMPr requirement onsite.
J	All solid wastes should be stored and disposed of appropriately.	Construction Operational	Ongoing	Applicant Contractor	EO (Monthly during operational phase) ECO (Monthly during construction phase)	Prevent pollution of the surrounding environment.	Waste disposal recon Visual observation of compliance with this EMPr requirement onsite. EO Monthly Reports

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
							ECO Monthly Reports
K	If storage of fuels, oils and other hazardous materials is required at the construction site, storage areas with bunded surfaces should be provided.	Construction	Ongoing	Applicant Contractor	EO (Monthly) ECO (Monthly)	Prevent pollution of the surrounding environment.	Visual observations of bunded surfaces.
L	Portable toilets to be placed at the formalised site camp, to be located at the greatest distance from the water courses, beyond 100 m, on bunded surfaces Portable toilets to be managed to prevent leakages and spillages.	Construction Operational	Ongoing	Applicant Contractor	EO (Monthly during operational phase) ECO (Monthly during construction phase)	Avoid effluent pollution and water quality degradation of surface and groundwater	Visual observation Site Plans (EO monthly checklist) (ECO Monthly Audit)
M	Prevent contamination from Battery Storage Facility: • Install secondary containment systems, such as bunding or spill trays, around the BESS to catch any leaks or spills before they contact the soil or water. • Regularly inspect BESS units for signs of damage, leakage, or degradation. Monitoring systems that detect leaks early can prevent extensive contamination. • Develop and implement emergency response procedures for spills,	Construction Operational	Ongoing	Applicant Contractor	EO (Monthly during operational phase) ECO (Monthly during construction phase)	Avoid effluent pollution and water quality degradation of surface and groundwater	Visual observation Site Plans (EO monthly checklist) (ECO Monthly Audit)

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	including the use of absorbent materials, neutralizing agents, and safe waste removal methods.						
14.19 WASTE MANAGEMENT							
A	• The Applicant and Contractor(s) shall comply with the environmental management principles referenced in the NEMA. • In respect of waste management, the 'cradle-to-grave' principle must be adhered to so as to ensure accountability for correct waste handling, storage and disposal.	Planning Construction Operational Decommissioning	Ongoing	Applicant Contractor	EO (Monthly during construction phase) EO (Annually during operational phase)	Accountability for waste management	Paperwork audits to verify compliance with cradle-to-grave principle. (Waste register) (Waste disposal records) (Safe disposal certificates) (EO weekly checklist) (ECO Monthly Audit)
B	Waste management must be a priority and all waste must be collected and stored effectively.	Construction Operational	Ongoing	Applicant Contractor	EO (Monthly during construction phase and annually during operational phase) ECO (Monthly during construction phase)	Ensure waste is adequately controlled in a responsible manner	Visual observation that waste management complies with EMPr requirements and relevant norms and standards.

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
							(EO monthly checklist) (ECO Monthly Audit)
C	A minimum of one toilet per 8 males and 2 per 8 females must be provided. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area.	Construction	Ongoing	Applicant Contractor	EO (Monthly) ECO (Monthly)	Ensure waste is adequately controlled in a responsible manner	Visual observation that waste management complies with EMPr requirements and relevant norms and standards.
D	The Contractor should supply properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility	Construction	Ongoing	Applicant Contractor	EO (Monthly) ECO (Monthly)	Ensure waste is adequately controlled in a responsible manner	Visual observation that waste management complies with EMPr requirements and relevant norms and standards. Waste Management Procedure
E	Where a registered disposal facility is not available close to the project area, the Contractor shall provide a method statement with regard to waste	Construction	Ongoing	Applicant Contractor	EO (Monthly) ECO (Monthly)	Ensure waste is adequately controlled in a responsible manner	Visual observation that waste management complies with

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	management. Under no circumstances may domestic waste be burned on site						EMPr requirements and relevant norms and standards. Waste Procedure
F	Refuse bins will be emptied and secured Temporary storage of domestic waste shall be in covered waste skips. Maximum domestic waste storage period will be 30 days.	Construction	Ongoing	Applicant Contractor	EO (Monthly) ECO (Monthly)	Ensure waste is adequately controlled in a responsible manner	Visual observation that waste management complies with EMPr requirements and relevant norms and standards.
14.20 SOCIAL							
A	• Glencore must maintain continuous dialogue with local communities through regular public meetings and consultations.. • Glencore should revisit and update their skills development plan to develop skills in the community to enable sourcing a greater portion of local labour.	Planning Construction Operation Decommissioning	Throughout project	Applicant CLO	ECO (Once off during construction) EO (monthly)	Reduce social impacts as far as possible	CLO reports
B	• A Community Liaison Officer who is trusted by the community and has the necessary skills and education	Planning Construction Operation	CLO and grievance mechanism in place	Applicant CLO	ECO (Once off during construction)	Grievance mechanism and CLO in place before	CLO reports

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	must be appointed before construction commences. • Glencore must create or update clear channels for grievance reporting and feedback to address community concerns promptly.	Decommissioning	before construction			construction commences	Grievance mechanism / complaints register
C	• As far as reasonably possible, the applicant should attempt to identify and employ workers from the surrounding local community. • Glencore should develop a community engagement plan for effective engagement with the community. • Glencore should also develop a skill development plan involving partnership with local technical education institutions.	Planning Construction	Ongoing	Applicant CLO	ECO (Once off during construction)	Employ locals where possible	CLO reports Local recruitment structures
D	Utilise existing community structures if available, to act as a communication link between the local community and the applicant for informing the local community of job opportunities and informing the Applicant of possible contractors in the local community. Glencore must ensure transparency in procurement and recruitment processes,	Planning Construction	Ongoing	Applicant CLO	ECO (Once off during construction)	Improvement of the local economy through employment	CLO report (if available) Local recruitment structures

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	in conjunction with community leaders in decision-making to prevent social unrest.						
E	Implementation of Occupational Health and Safety (OHS) orientation training for all new employees .	Throughout project	Ongoing	Applicant	EO (monthly)	OHS compliant training systems in place	Training records / presentations etc
14.21 DECOMMISSIONING							
A	Should the project reach decommissioning stage, the relevant permits / licences and/or authorisations must be applied for.	Decommissioning	Upon completion of development.	Applicant	Applicant (As and when necessary)	Ensure that the decommissioning activity is undertaken in a legally responsible manner.	Visual observation that decommissioning complies with EMPr and legal requirements. Applicant permits / licences / authorisations in hand)
B	Minimize visual impacts associated with decommissioning: • Engage with the local community and stakeholders to understand their views and preferences. This can help to guide the decommissioning process in a way that is sensitive to local visual preferences. Re-use of Infrastructure: Where possible, consider re-using some of the infrastructure for other purposes. For	Decommissioning	During decommissioning phase	Applicant Contractor	ECO (Once off during decommissioning)	Ensure that the decommissioning activity is undertaken with minimal visual impacts.	Visual observation that decommissioning complies with EMPr and legal requirements

TECHNICAL OR MANAGEMENT OPTIONS							
Item No.	Technical or Management Option	Phase	Timeframes	Responsible Party	Monitoring Party (Frequency)	Target	Performance Indicators (Monitoring Tool)
	example, access roads could be left in place for use by local landowners, if appropriate and agreed upon. • Phased Decommissioning: Implement a phased approach to decommissioning to minimise the area of disturbance at any given time. • Site Restoration: Prioritise immediate restoration of areas once the infrastructure is removed, including re-vegetation with native species. • Minimise Ground Disturbance: Use techniques that minimises ground disturbance during the removal of infrastructure. • Waste Management: Ensure all materials, especially non-biodegradable ones, are properly disposed of or recycled, leaving no remnants behind. • Monitoring: Post-decommissioning, monitor the site's recovery and implement any necessary interventions to ensure successful landscape restoration.						

15 APPENDICES

APPENDIX 1: EAP CV

CURRICULUM VITAE

Name:	Matshego Keikelame
Nationality:	South African
Date of Birth:	14 January 1991
Profession:	Environmental Consultant
Professional Qualification/ Training:	Post Graduate Diploma in Integrated Water Management; University of the Free State, 2020
	Bsc Geography, University of the Free State, 2015
Professional Membership/ Registrations:	Registered Professional Natural Scientist Cand. (SACNASP- 121534) EAPASA Registered Environmental Assessment Practitioner (2019/405)
Current Employer:	Environmental Impact Management Services (Pty) Ltd.

KEY EXPERIENCE

Matshego Keikelame is a current Environmental Consultant with 9 years' working experience. He is a registered professional with SACNASP as a Candidate Environmental Scientist and a Registered Environmental Assessment Practitioner with EAPASA. Matshego has professional background in Environmental Management having academic qualifications which focused on this discipline as well as work experience gained from previous organizations. He has undertaken and managed numerous projects in his fields of expertise for public sector, and private sector and has developed a track record of professional excellence in the field. His key experience includes:

- Experience with identification and assessment of environmental impacts.
- Experience in environmental compliance and monitoring.
- Knowledge of and experience Water Use License Applications.
- Knowledge and experience of public participation process.
- Project management.

CAREER SUMMARY

Period: March 2024 – Present	Organisation: EIMS	Position: Environmental Consultant
Key Projects/Assignments	Currently involved in a number of ongoing projects, EIAs, etc. Selected project Experience: • Elandsfontein Colliery Integrated Water and Waste Management Plan Update • Motuoane Energy (Pty) Ltd Site Screening and Verification Report	

	• Glencore Lydenburg Solar Photovoltaic Facility Environmental Impact Assessment Report and Water Use License • JRA Upgrading of roads and stormwater infrastructure project ECO monitoring • Siyanda Bakgatla Platinum Mine, GN 704 External Audit Report	
Period: October 2023 – February 2024:	**Organisation: Milnex Environmental Consultants**	**Position: Environmental Consultant**
Key Projects/Assignments	Environmental Assessment Practitioner for the following: • Environmental Impact Assessment for the proposed prospecting right application with bulk samples for Lintez Diamonds (Pty) Ltd to prospect for Diamonds Alluvial (DA), Diamonds General (D), and Diamonds (DIA) • Basic Assessment and EMPr for Proposed Mining Permit for Big Sand Diamond Pty Ltd for the mining of Diamonds (Alluvial, General & in Kimberlite) including associated infrastructure, structure, and earthworks, Northern Cape Province. • Environmental Impact Assessment for the proposed prospecting right application for Central Node (Pty) Ltd to prospect for Diamonds Alluvial (DA) with bulk sampling including associated infrastructure, structure and earthworks, North West Province • Environmental Impact Assessment for the proposed prospecting right application with bulk samples for Empire Mega Gem (Pty) Ltd to prospect for Diamonds Alluvial (DA), Diamonds General (D), and Diamonds (DIA), North West Province.	
Period: May 2021 – September 2023	**Organisation: GladAfrica Management Service (Pty) Ltd**	**Position: Environmental Assessment Practitioner**
Key Projects/Assignments	Project Manager and/or Environmental Assessment Practitioner for the following: • Environmental Audits and Compliance Monitoring for the Mangaung Metro Municipality: Resealing of streets in Bloemfontein South (De Waal & Vista Park School Streets), Free State Province • Environmental Audits and Compliance Monitoring for the Mangaung Metro Municipality: Resealing of streets in Bloemfontein North (Alexander, Kolbe, Roth & East Burger Streets), Free State Province • Water Use Authorisation application process for the licensing of the existing & future boreholes and dewatering of groundwater to allow for construction activities within the Sol Plaatje University in Kimberley, Northern Cape Province • Water Use Authorisation Process for the proposed construction of a special school and hostel in Trompsburg, Free State Province	

	• Basic Assessment Process and a Water Use Licence process for the proposed sewage treatment package plant in Lusaka for the proposed community healthcare centre, Free State Province. • Phase 1A of the LHWP comprised the construction of Katse dam, from which water is transferred under gravity via concrete line transfer tunnel to the 'Muela hydro power station. Phase IB comprised the construction of Mohale dam and Advanced infrastructure, Lesotho. Assistant Environmental Auditor role. • Environmental Audits and Compliance Monitoring for the Proposed Development of Sol Plaatje University in Kimberly, Northern Cape. • Environmental Audits and Compliance Monitoring for the Construction of New Buildings at the Bloemfontein Campus of Central University of Technology, Free State Province • Environmental Audits and Compliance Monitoring for the Construction of New Buildings at the Welkom Campus of Central University of Technology, Free State Province • Environmental Audits and Compliance Monitoring for the Proposed Development of Sol Plaatje University in Kimberly, Northern Cape (New Framework) , Northern Cape Province • Public Participation Process for the Foskor-Merensky 400kV Power Line, Limpopo Province	
Period: August 2017 – April 2021	**Organisation: Environmental Management Group Pty Ltd**	**Position: Environmental Consultant**
Key Projects/Assignments	Project Manager and Environmental Assessment Practitioner for the following: • Environmental Monitoring Lerato Park Phase 2 Integrated Housing Developments – Construction of 362 Free Standing Subsides, Northern Cape Province • Provision of Environmental Consulting Services for the Upgrading of The Gravel Section of MR947 Between Rusfontein and Laxy, Northern Cape Province • Environmental Impact Assessment for the Proposed Development of Ageng Brick manufacturing Plant, Free State Province • Basic Assessment Process for Department of Rural Development and Land Reform for Zondwa Sandstone Mine, Free State Province. • Basic Assessment for the Upgrade of gravel Roads between Magobing, Masankong and Batlharos, Northern Cape Province • Environmental Audits and Compliance Monitoring for Dr. Ruth Segomotsi Mompati District Municipality Water Provision Project appointed by SMECSA Pty Ltd and Tsela Tsweu Consultants, Northern Cape Province	

	• Environmental Impact Assessment for the proposed Matjhabeng Multipurpose Sports complex Precinct IDP Project, Free State Province. • Environmental Audits and Compliance Monitoring for the Development of Britstown WWTW and Sewage Pipeline, Northern Cape Province. • Environmental Audits and Compliance Monitoring for the Free State Department of Human Settlements Water and Sewer Reticulation Development, Free State Province. • Basic Assessment and Environmental Management Programme for the Thusanong Ostrich Enterprice: Ostrich Feedlot in Petrusburg, Free State Province • Basic Assessment and Environmental Management Programme for the Piggery Upgrade: Thozama Agricultural Primary Cooperative Limited in Paradys, Free State Province • Basic Assessment and Environmental Management Programme for the Upgrade of Itereleng Piggery Primary Cooperative Limited in Sediba, Free State Province. • Basic Assessment and Environmental Management Programme for the Sediba Farmer Production Support Unit, Free State Province. • Basic Assessment and Environmental Management Programme for the Stella Bulk Sewer and Internal Reticulation, North West Province. • Basic Assessment and Environmental Management Programme for the Proposed Development of Sekute Farming Chicken Layers Facility, Free State Province • Basic Assessment and Environmental Management Programme for the Piggery Development: Good Morning Piggery in Harrismith, Free State Province	
Period: July 2015 – August 2017	**Organisation: Department of Police, Roads and Transport (Placed at Miletus Consulting)**	**Position: Environmental Science Intern**
Key Projects/Assignments	Environmental Science Intern at Department of Police, Roads and Transport (Placed at Miletus Consulting) – Free State Province, South Africa. Worked on the following projects: • Borrow Pit Reserved in Terms of The Free State Roads Ordinance for Free State Department of Police Roads and Transport. Project entails applying for mining permits in terms of the Minerals and Petroleum Recourses	

LANGUAGE CAPABILITY

Language	Speak	Read	Write
English	Excellent	Excellent	Excellent
Afrikaans	Average	Average	Average
Tswana	Excellent	Good	Good
Sotho	Good	Good	Good

DECLARATION

I confirm that the above information contained in the CV is an accurate description of my experience and qualifications and that, at the time of signature.

Signature of Staff Member

07/06/2024

Date

Environmental Assessment Practitioners Association of South Africa

Registration No. 2019/405

Herewith certifies that

Matshego Keikelame

is registered as an

Environmental Assessment Practitioner

Registered in accordance with the prescribed criteria of Regulation 15. (1) of the Section 24H Registration Authority Regulations (Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).

Effective: 01 March 2024

Expires: 28 February 2025

Chairperson

Registrar

SAQA

SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Matshego Oregolele Keikelame

Registration Number: 121534

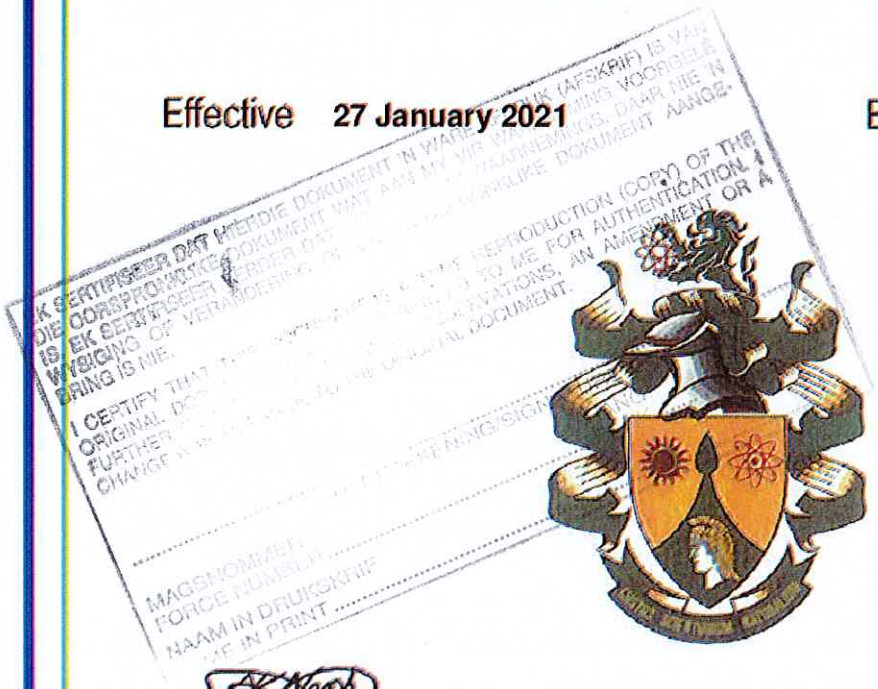
is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science (Candidate Natural Scientist)

Effective **27 January 2021**

Expires **31 March 2025**



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Postgraduate Diploma in Integrated Water Management

HAS BEEN CONFERRED UPON

KEIKELAME, Matshego Oregolele

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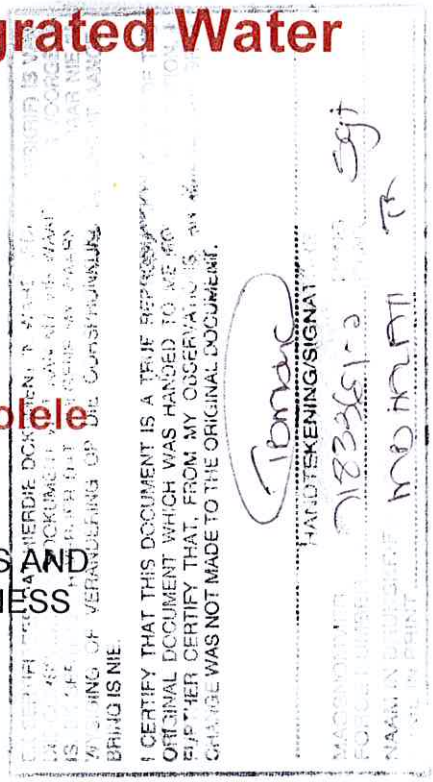

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UNIVERSITEIT VAN DIE VRYSTAAT
YUNIVESITHI YA FREISTATA

THIS IS TO CERTIFY THAT THE DEGREE HIERMEE WORD VERKLAAR DAT DIE GRAAD

Baccalaureus Scientiae

HAS BEEN CONFERRED UPON
TOEGEKEN IS AAN

KEIKELAME, Matshego Oregolele

IN ACCORDANCE WITH THE STATUTES AND RULES OF THE UNIVERSITY. AS WITNESS OUR RESPECTIVE SIGNATURES AND THE SEAL OF THE UNIVERSITY BELOW.

NADAT AAN DIE STATUTE EN REELS VAN DIE UNIVERSITEIT VOLDOEN IS, AS BEWYS DAARVAN PLAAS ONS ONS ONDERSKEIE HANDTEKENINGE EN DIE SEËL VAN DIE UNIVERSITEIT HIERONDER.

SOUTH AFRICAN POLICE SERVICE
COMMUNITY SERVICE CENTRE
2024 -04- 24
LINDEN
SUID-AFRIKAANSE POLISIEDIENS

ENDORSEMENT: GEOGRAPHY
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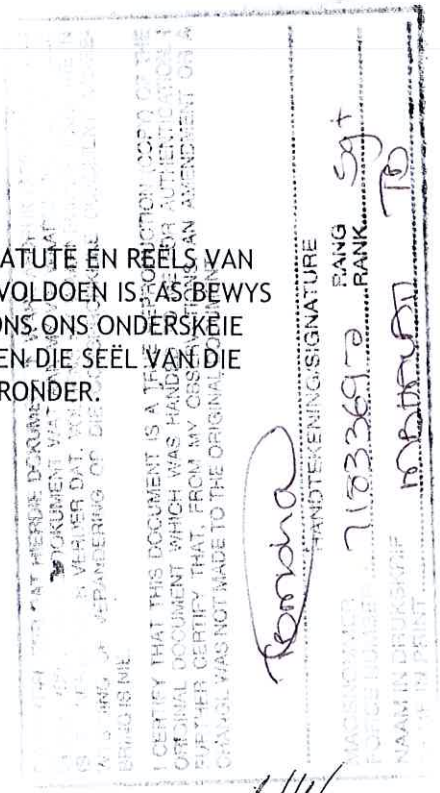

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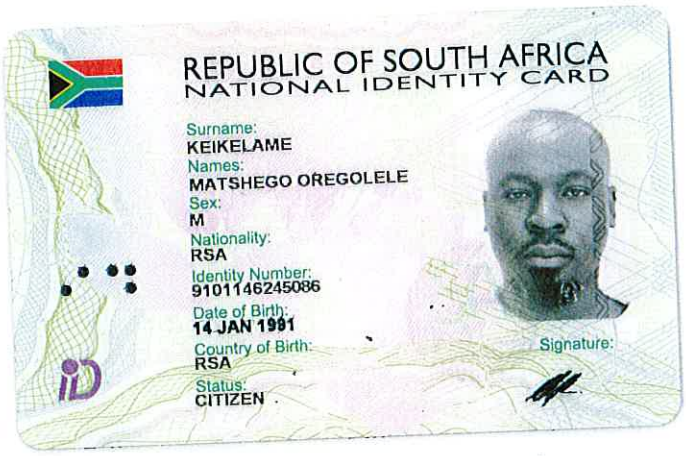

REPUBLIC OF SOUTH AFRICA
NATIONAL IDENTITY CARD

Surname:
KEIKELAME
Names:
MATSHEGO OREGOLELE
Sex:
M
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Country of Birth:
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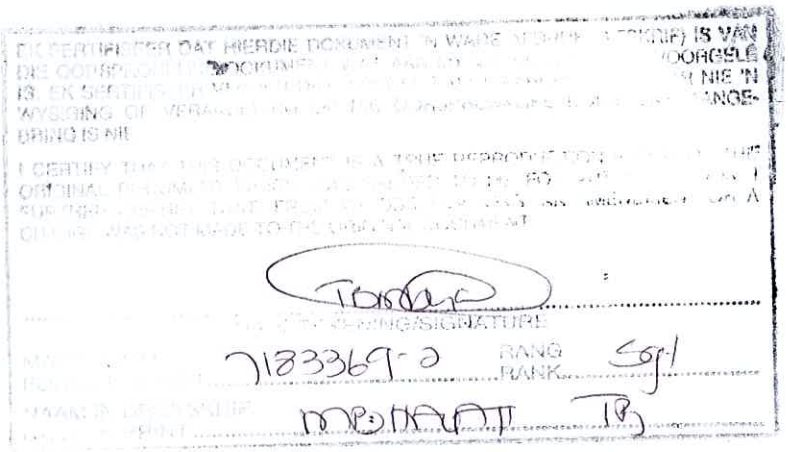

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