ENVIRONMENTAL MANAGEMENT PROGRAM FOR THE INSTALLATION OF HIGH MAST LIGHTS WITHIN THE JURISDICTION OF EMALAHLENI MUNICIPALITY IN MPUMALANGA PROVINCE.

MUNICIPALITY:

EMALAHLENI LOCAL MUNICIPALITY

PO Box 3, eMalahleni, 1035

Civic Centre, Cnr Mandela & Arras Streets, **eMalahleni**

ENGINEERS:

AMANTLE CONSULTING ENGINEERS

PREPARED BY:

GRANT SAFETY HEALTH ENVIRONMENTAL PRACTITIONERS

Soverby 23

Valencia Street

Bendor, Polokwane

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DECLARATION

I the undersigned in my capacity as designated below do hereby undertake to ensure that the conditions and recommendations in terms of this Environmental Management Programme (EMPr) for the Construction phase are implemented and assume full responsibility and accountability in all aspects thereof

I further understand that officials from the relevant Competent Authority may during any phase of the project, conduct an inspection of the development in order to ensure compliance with the conditions and recommendations as outlined in the EMPr.

CONTRACTOR

Company:

Name:

Designation:

Signature:

Date:

ACRONYMS

ACRONYM	MEANING
CARA:	Conservation of Agricultural Resources Act
CITES:	Convention of International Trade in Endangered Species
DEA:	Department of Environmental Affairs
DWS:	Department of Water and Sanitation
EA:	Environmental Authorisation
ECO:	Environmental Control Officer
EIA:	Environmental Impact Assessment
EMPr:	Environmental Management Programme report
EMS:	Environmental Management System
ESO:	Environmental Site Officer
I &/or APs:	Interested and/or Affected Parties
IEC:	Independent Environmental Consultant
IEM:	Integrated Environmental Management
ISO:	International Standards Organisation
LEDET:	Limpopo Department of Economic Development, Environment and Tourism
NEMA:	National Environmental Management Act
SAHRA:	South African Heritage Resources Agency

GLOSSARY OF TERMS

Alien Vegetation: *Alien vegetation is defined as undesirable plant growth which shall include, but not be limited to all declared category 1 and 2 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed to be alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable*.

Construction Camp: *Construction camp (site camps) refers to all storage and stockpile sites, site offices, container sites, workshops and testing facilities and other areas required undertaking construction activities.*

Environmental Site Officer (ESO): *An ESO is the site-based designated person responsible for implementing the environmental provisions of the Construction Contract and is appointed by the service provider that carries out construction activities. The ESO shall be the designated responsible person, for implementing any remedial measures as required from time to time and for any authorisations/licences that are required in terms of the service contract. The ESO shall record and communicate environmental issues (as they occur) to the Contractor and maintain records thereof. The ESO shall report concurrently to the contractor and the ECO.*

Environmental Control Officer (ECO): *A suitably qualified and experienced person or entity appointed for the Construction Works, to perform the obligations specified in the environmental authorisation.*

Environmental Aspect: *An environmental aspect is any component of a contractor's construction activity that is likely to interact with the environment.*

Environmental Authorisation (formerly known as, Record of Decision): *A written statement from the relevant environmental authority, with or without conditions, that records its approval of a planned undertaking to build or upgrade a section of road and the mitigating measures required to prevent or reduce the effects of environmental impacts during the life of a contract.*

Environmental Impact: *An impact or environmental impact is the change to the environment, whether desirable or undesirable, that will result from the effect of a construction activity. An impact may be the direct or indirect consequence of a construction activity.*

Environmental Impact Assessment*: The process of examining the environmental effects of a proposed development. The assessment requires detailed/specialist studies of significant issues that have been identified during the environmental scoping.*

Environmental Management Programme: *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.*

Environmental Management System: *The internationally accepted and recognized environmental management system (EMS) which enables companies, organizations and operations to systematically manage, prevent and reduce environmental problems and associated costs. In terms of ISO 14001 and EMS is defined as,* "***that part of the overall management system includes organizational structure, planning activities, responsibilities, procedures, processes and resources for developing, implementing, reviewing and maintaining the environmental policy.***"

Environmental Policy: *A statement by the organisation of its intentions and principles in relation to its overall environmental performance which provides a framework for action and for the setting of its environmental objectives and targets.*

Independent Environmental Consultant: *A suitably qualified and experienced independent environmental consultant (IEC) appointed by the Engineer to perform the obligations specified in the Contract. The IEC shall provide reports to the regulatory authority, the Engineer and any other parties as specified by the regulatory authority.*

Interested and Affected Party: Refers to an interested and affected party contemplated in section 24(4)(d) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and which in terms of that section includes –
a) Any person, groups of persons, organization interested in or affected by an activity, and;
b) Any organ of state that may have jurisdiction over any aspect of the activity.

ISO 14001 Environmental Management System (ISO 14001): The internationally accepted and recognised Environmental Management System as reflected in the document SABS ISO 14001: 1996.
Method Statement: *A written submission by the Contractor in response to the Specification or a request by the Engineer, setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity, identified by the relevant specification or the IEC when requesting the Method Statement, in such detail that the IEC is enabled to assess whether the Contractor's proposal is in accordance with the EMPr and associated specifications.*

Mitigate: *The implementation of practical measures to reduce the adverse impacts, or to enhance beneficial impacts of a particular action.*

No-Go Area: *Areas where construction activities are prohibited*.

Pollution: *According to the National Environmental Management Act, No. 107 of 1998, pollution can be defined as, "Any change in the environment caused by (i) substances; (ii) radioactive or other waves; or (iii) noise, odours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future"*

Rehabilitation: *To re-establish or restore to a healthy, sustainable capacity or state.*

Site: *The area in which construction is taking place*.

Species of Special Concern: *Those species listed in the Rare, Indeterminate, or Monitoring categories of the South African Red Data Books, and/or species listed in Globally Near Threatened, Nationally Threatened or Nationally Near Threatened categories (Barnes, 1998).*

Threatened species: *Threatened species are defined as: a) species listed in the Endangered or Vulnerable categories in the revised South African Red Data Books or listed in the Globally Threatened category; b) species of special conservation concern (i.e. taxa described since the relevant South African Red Data Books, or whose conservation status has been highlighted subsequent to 1984); c) species which are included in other international lists; or d) species included in Appendix 1 or 2 of the Convention of International Trade in Endangered Species (CITES).*

Topsoil: *The top 100mm of soil and may include top material e.g. vegetation and leaf litter*

DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER

Environmental Consultant	Grant Safety Health Environmental Practitioners (GSHEP)
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Summary of EAP's past experience	Mr. Frank Tendai Mhandu ***(MscCB; PrNatSci,(120638); EAPASA, (2020/268)***. The EAP obtained a Bachelor of Environmental Science Honours degree in 2007 (SAQA equivalence: B.Tech Nature Conservation) and Masters of Science degree in Conservation Biology (SAQA eqiuvalence:Msc Biodiversity and Conservation) from Zimbabwe in 2012. He has over 5 years working experience in environmental management and has completed several EIA projects.

PREFACE

This Environmental Management Program report was compiled to address the potential environmental, social and economic impacts associated with the proposed project, by prescribing meaningful and practical mitigation measures through specialist consultation and adherence to relevant environmental legislation, and to prevent the occurrence of irreversible environmental degradation. These mitigation measures must be made binding to all contractors during all of the project phases. In addition to the EMPr, contractors must be compliant with the requirements set out in the Occupational Health and Safety Act (Act No. 85 of 1993), as well as all other laws and by laws, including the Construction regulations and the SANS set of standards.

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1. INTRODUCTION

1.1 Purpose of the Environmental Management Programme

This Environmental Management Programme (EMPr) is prepared as part of the requirements of the Environmental Impact Assessment (EIA) Regulations (December 2014, as amended in April 2017) promulgated under the National Environmental Management Act (NEMA) (Act 107 of 1998, as amended).The purpose of this EMPr is to ensure "good environmental practice" by taking a holistic approach to the management and mitigation of environmental impacts during the " the installation of high mast lights within the jurisdiction of Emalahleni Municipality in Mpumalanga province**.** This EMPr therefore sets out the methods by which proper environmental controls are to be implemented by management.

This EMPr is considered as a document that can be updated as new information becomes available during the "construction", operational and decommissioning phases, if applicable, of the proposed development. Mitigation measures need to be implemented as addressed in this EMPr, except where they are not applicable, and additional measures should be considered when necessary. The EMPr identifies the following:

This EMPr has been compiled using the concepts below in order to uphold the principles of sustainable development:

- Continuous improvement. The project proponent must commit to review and to continually improve environmental management, with the objective of improving overall environmental performance.
- Broad level of commitment. A broad level of commitment is required from all levels of management as well as the workforce in order for the development and implementation of this EMPr to be effective.
- Flexible and responsive. The implementation of the EMPr must respond to new and changing circumstances. The EMPr is a dynamic "living" document and thus regular planned review and revision of the EMPr must be carried out.
- Integration across operations. This EMPr must integrate across existing line functions and operational units such as health, safety and environmental departments in a company/project. This is done to change the redundant mind-set of seeing environmental management as a single domain unit.
- Compliance with legislation. While any development project during its construction phase is a dynamic activity within a dynamic environment, the Developer, Engineer, Contractor and Sub-contractors must be aware that certain activities conducted during construction may require further licensing or environmental approvals. The Contractor must consult the ER, EO and ECO on a regular basis in this regard.

2. PROJECT DESCRIPTION AND LOCALITY

The Proposed activity entails the installation of high mast lights within the jurisdiction of Emalahleni Municipality in Mpumalanga Province**.**

The project co-ordinates are listed below:

The Lights are to be installed in various areas listed below:

Vosman 1: 25º52'15.2"S; 29 º08'43.3"E

Hlalanikahle extension-1: 25º51'13.8"S; 29 º07'29.2"E

Empumelelweni, taxi rank, high mast-1: 25º51'16.3"S; 29 º05'38.8"E

Empumelelweni, high mast-2: 25º52'00.6"S 29 º05'36.5"E

Extension 18: 25º51'32.7"S; 29 º06'37.0"E

Klarinet: 25º50'03.6"S; 29 º12'47.4"E

Siyanqoba: 25º48'26.2"S; 29 º10'55.9"E

Siyanqoba: 25º448'23"S; 29 º0.4"E

Siyanqoba: 25º448'37"S; 29 º10'.39.6"E

Siyanqoba: 25º448'40.35"S; 29 º10'.06.5"E

Ga-Nala , Thubelihle: 26º12'58.3"S; 29 º17'51.4"E

Ga-Nala, Extension 10, David street: 26º15'54.7"S; 29 º15'02.0"E

Ogies, Extension 3: 26º00'01.6"S; 29 º02'26.1"E

Ogies, Phola,Tycoon, Zone2: 26º00'12.2"S; 29 º02'05.5"E

Leeuwpoort Landfill site: 25º49'20.8"S; 29 º10'28.1"E

Blesboklaagte Cemetery: 25º48'46.5"S; 29 º13'20.7"E

Sy Mthimunye Stadium, Ackerville central absolute location (4 lights): 25º52'11.2"S; 29 º10'33.8"E

Extension 4: 25º51'40.7"S; 29 º07'25.4"

The Maps below indicated the Location of works:

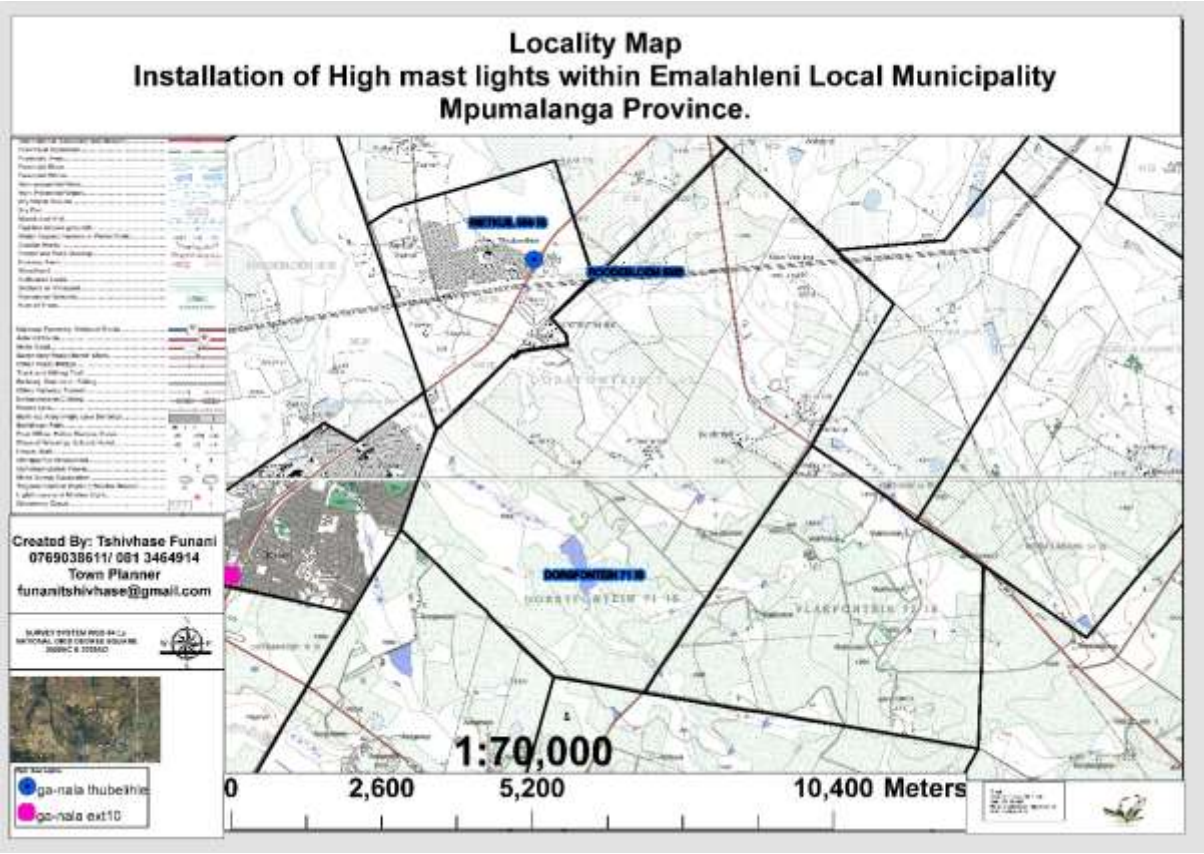


Figure 1: Locality Map

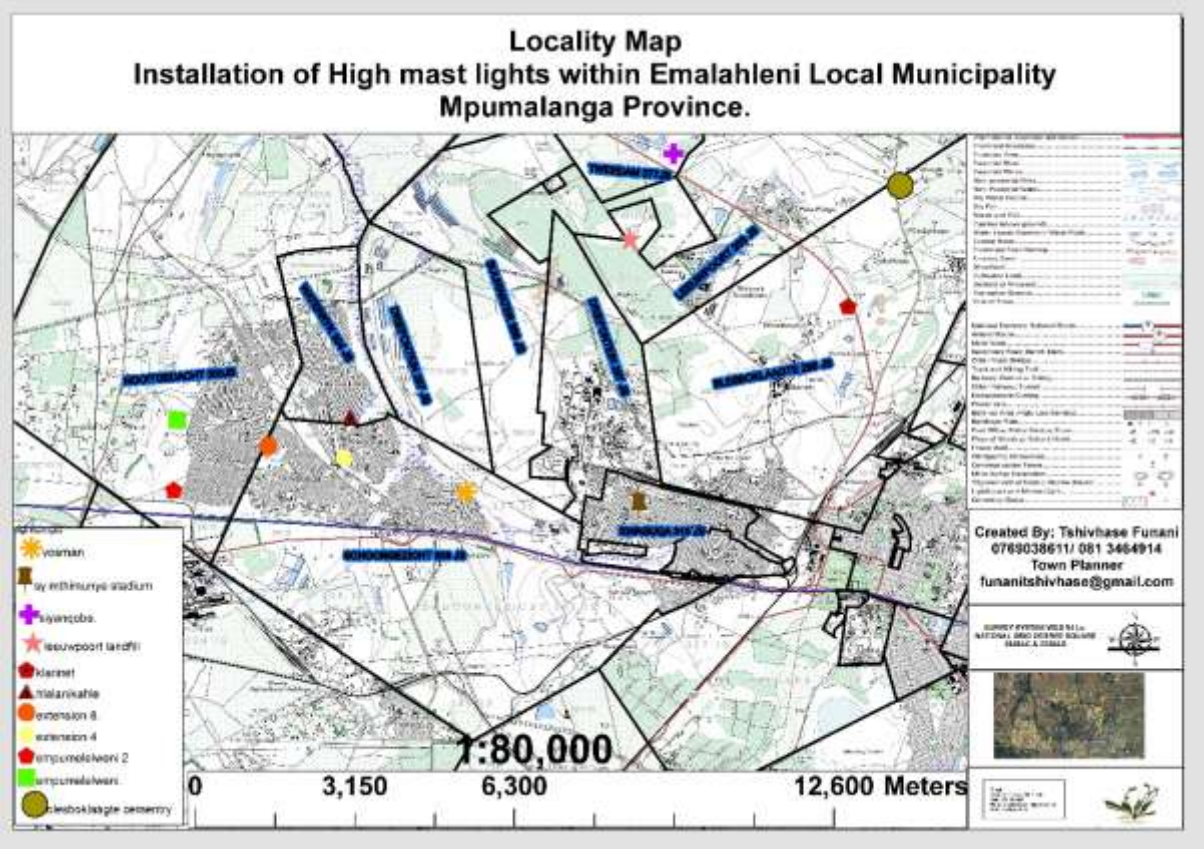


Figure 2: Locality Map

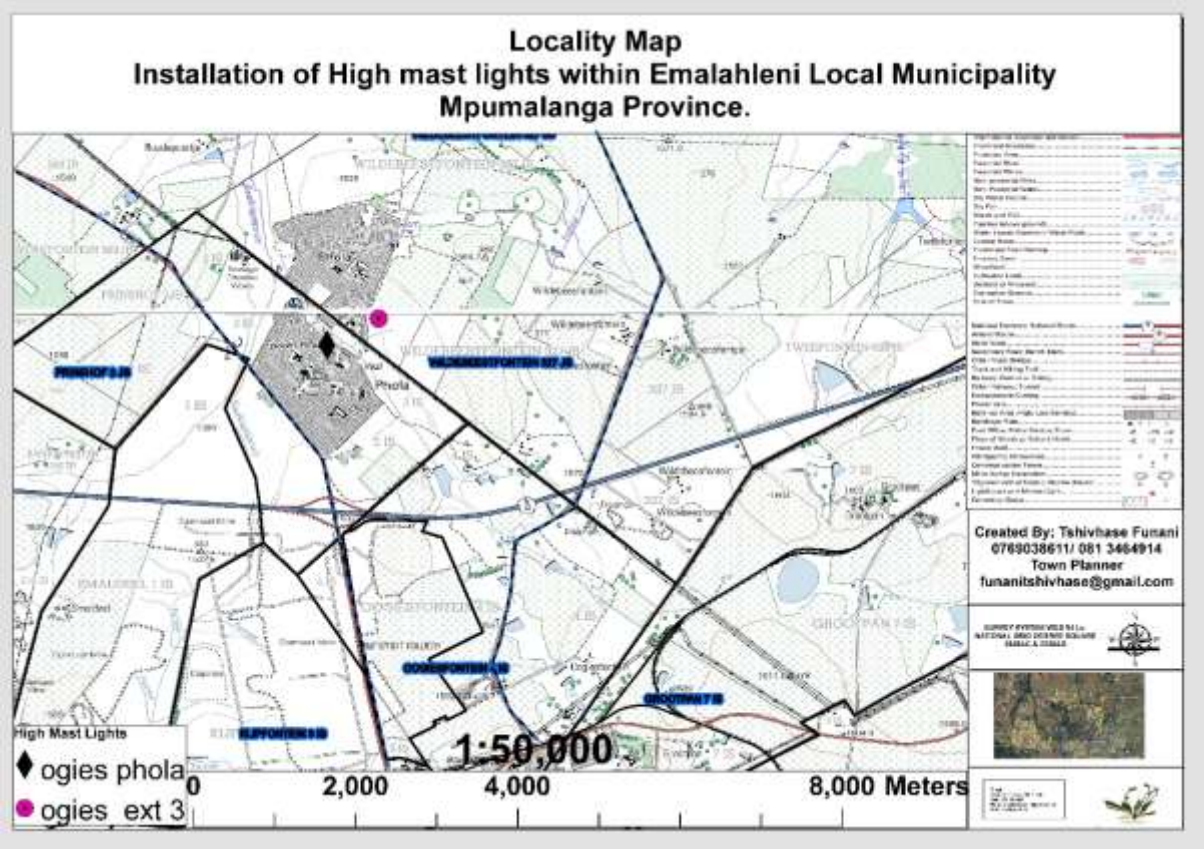


Figure 3: Locality Map

3. PROJECT`S BIOPHYSICAL ENVIRONMENT

3.1 Status Quo of the Natural Environment

3.1.1 Topography

The ELM is located on the Highveld plateau and is characterised by an undulating landscape without significant hills or ridges figure below. It is located approximately 1 600 metres above sea level, with drainage occurring mostly in a northern direction. The landscape in the ELM is generally flat, with slopes of less than 1:30. This causes problems with the drainage of developments. Steeper slopes are found close to the rivers in the area.

3.1.2 Geology

The southern portion of the ELM is underlain by more or less continuous coal development of the Karoo Sequence. The subterranean levels in the area, known as the Mid-Ecca Group, were formed from the Karoo sequence and are located on a Dwyka conglomerate. The Karoo Super group consists of six different layers, with the fourth layer being the Mid-Ecca Group, where rich coal deposits were formed.

3.1.3 Nature reserves and Conservation areas

The only conservation area in the ELM is the Witbank Nature Reserve. This was originally established as a recreation resort around the Witbank Dam, but was proclaimed as a nature reserve in 1979. Approximately 65% of the reserve is covered by the Rocky Highveld Grassland veld type which is protected. The remaining 35% of the reserve comprises woody species and is less species diverse than the Rocky Highveld Grassland.

3.1.4 Ecological Status

The water courses within ELM form part of the Olifants River drainage system, which flows towards the Indian Ocean. The South African River Health Program previously conducted a survey within the Olifants River catchment, which was completed in 2001, and found the rivers within the ELM to be of a fair to unacceptable health, based on the biological communities and riparian and instream habitat. Mines and power stations within the Upper Olifants sub-catchment participating in the Controlled Saline Water Release Scheme are required to do biological monitoring as a permit condition imposed by the Department of Water Affairs and Sanitation. Monitoring points have been selected in the various management units, and monitoring of the surface waters is done biannually. Within the ELM, 82.91% of the river signatures are considered critically endangered, with the remaining 17.03% considered to be endangered. A critically endangered river signature is one for which there are few remaining intact examples, thus putting the biodiversity pattern and ecological processes associated with that river signature at risk.

4. ROLES AND RESPONSIBILITIES

Key	Function	Responsibility
M	Management	Management is responsible for the overall environmental monitoring and implementation of the EMPr, and ensuring compliance thereof with the specifications of the Environmental Authorisation (EA) issued in terms of NEMA. Management should also ensure that any other permits or licences required as part of this project are obtained and complied with. The Management may, however, at their own costs, render the services of an external environmental consultant to oversee the implementation of the documented mitigation measures of this EMPr. It is also expected that management will appoint an Environmental Control Officer, Environmental Health and Safety Officer, and "Construction" Manager.
C	Contractor	The contractor is bound to the EMPr conditions through contract, and is responsible for ensuring that they adhere to all conditions to the EMPr. The Contractor must thoroughly study the EMPr requirements before establishing on site and must request clarification on any aspect of the document, should they be unclear. • The contractor must implement all the requirements of the EMPr on a daily basis. The contractor must comply with all instructions (whether verbal or written) given by the Engineer and ECO, in terms of the EMPr. • Keeping a copy of the EMPr and EA on site and implementing the EMPr • Appointing a qualified full time Environmental Officer to assist with daily compliance Preventing negative impacts on the environment by responsible construction • Maintaining a register of complaints and queries by members of the public at the site office. This register is forwarded to the ECO on a monthly basis. • Maintaining all approved infrastructure in good working order to effectively fulfil its intended purpose and to prevent negative environmental impacts

		• Immediately remedying any factors that contribute to negative environmental impacts • Removing non-functional structures • Ensuring waste disposal at a suitable, permitted waste disposal facility • Ensuring that suitable arrangements are made to protect the environment against long term negative impacts arising from construction • Minimizing negative visual impacts • Cleaning up contaminants of the environment immediately • Preventing erosion through regular monitoring and rehabilitation of degraded areas and implementation of erosion controls • Rehabilitating site and maintaining for a minimum of 6 months thereafter
E	Engineer	The Engineer (or project manager) is the appointed role player responsible for coordinating and integrating activities across multiple, functional lines. The Engineer is responsible for ensuring that the contractor considers environmental matters seriously by compelling the contractor to comply. The Engineer is responsible for the following: • Keeps copy of EA and EMPr • Ensures that all designs and layout take consideration of sensitive areas and no-go zones and that these are excluded from development where possible (including recommendations made in the EIA and EMPr) • Arrange meetings or consults with IAPs about the impending construction activities and assists in communication throughout the project; • Assessing the Contractor's environmental performance in consultation with the Environmental Officer from which a brief monthly statement of environmental performance is drawn up for record purposes; • Documenting in conjunction with the Contractor, the state of the site prior to construction activities commencing. This documentation will be in the form of photographs or video. • Negotiate with/community members as required. • May on the recommendation of the Environmental Control Officer order the Contractor to suspend any or all works on site if the Contractor or his Subcontractor/ supplier fails to comply with the Environmental Management Program; • Ensure that the ECO has their full backing regarding environmental matters

		• Requesting amendments to the EMPr when needed, on behalf of contractor or applicant • Ensure that all problems identified during environmental inspections, are addressed and rectified by the contractor as soon as possible.
ECO	**Environmental Control Officer**	The Environmental Control Officer will be appointed by the applicant as a monitor of the implementation of, and compliance with, the EMPr. The ECO must be involved in all aspects of the project that can influence environmental conditions on the site. The Environmental Control Officer (ECO) will be the responsible person for ensuring that the provisions of the EMPr as well as the EA are complied with at all times. The ECO must fully communicate the environmental management processes associated with the project, particularly the EMPr, as well as review and ensure compliance with the conditions of the EMPr. The ECO will be responsible for issuing instructions to contractors and employees in terms of actions required with regards to environmental considerations. The ECO shall, on a regular basis, prepare and submit written reports to Management and the Competent Environmental Authority as required. The ECO: • Is to be considered to be the representative of the Competent Environmental Authority • Monitors contractor and applicant compliance with the EMPr and EA • Takes baseline photos of site • Reviews method statements from contractor for various aspects of work and environmental components such as alien plant control and rehab plan • Liaise with all authorities and departments regarding environmental matters, especially the Competent Environmental Authority • Liaise with the engineer and contractor regarding environmental management • Undertake monitoring and auditing as per prescribed period and frequency • Record all findings, non-compliances and recommendations in an objective and transparent manner in an audit report, submitted to all parties • Make recommendation for additional mitigation and improvements to EMPr as required; Has the authority to stop work in emergency situations in conjunction with the engineer

E O	**Environmental Officer**	The contractor must appoint an internal Environmental Officer (EO) to assist with day-to-day monitoring of the construction activities. The EO shall ensure and enforce the implementation of the EMPr and EA and specialist studies, if any, on a daily basis, which would extend to identification, protection and documentation of biodiversity on the site and their preservation, as well as application for permits. Any issues raised by the ECO will be routed to the Engineer and EO for the contractors' attention. The EO shall be permanently on site during the construction phase to ensure daily environmental compliance with the EMPr and should ideally be a senior and respected member of the construction crew, with a suitable environmental management qualification and experience. Past experience has revealed that EO's that can relate to the work force are the most effective for information transfer and ensuring compliance with the EMPr. However, the EO must have a full qualification and some experience in onsite environmental management. The EO: • Opens environmental file and maintains this on site • Open and maintains incident register (complaints, non-compliances, etc) • Keeps EA and EMPr and reports on site and on company website • Remain full time on site during construction and rehabilitation • Ensures, implements and enforces contractor's daily compliance with the EMPr and EA • Takes baseline photos of site • Provides method statements as requested by the ECO • Applies for permits when required, may request assistance of the ECO • Identify, protect and document biodiversity on the site and ensure their preservation. May request assistance from ECO • Undertake daily monitoring and auditing ϖRecord all findings, non-compliances and recommendations in a daily checklist and weekly report, which is also sent to ECO. • Consults with ECO in conjunction with Engineer before an aspect of work can proceed • Follows all instructions from the ECO and closes out all items

EHS	**Environmental Health and Safety Officer**	The responsibility of the EHS Officer includes overseeing the implementation of the EMPr during the construction and operational phases, monitoring environmental impacts, record-keeping and updating of the EMPr as and when necessary. During "construction" **(i.e. all activities associated with clearing the land for cultivation**), the EHS Manager will be responsible for the following: • Meeting on site with the Construction Manager prior to the commencement of construction activities to confirm the construction procedure and designated activity zones. • Daily or weekly monitoring of site activities during "construction" to ensure adherence to the specifications contained in the EMPr and Environmental Authorisation using a monitoring checklist that is to be prepared at the start of the "construction" phase. • Preparation of the monitoring report based on the daily or weekly site visit. • Reporting of any non-conformances within 48 hours of identification of such non-conformance to the relevant agents. • Conducting an environmental inspection on completion of the construction period and 'signing off' the construction process with the Construction Manager. During operation, the EHS Officer will be responsible for: • Overseeing the implementation of the EMPr and monitoring programmes for the operation phase. • Reviewing the findings of the monitoring and highlight concerns to management where necessary. • Ensuring compliance with the Environmental Authorisation conditions and related permits. • Ensuring that the necessary environmental monitoring takes place as specified in the EMPr. • Updating the EMPr and ensuring that records are kept of all monitoring activities and results. • At the time of preparing this EMPr, the EHS Manager appointment is still to be made by the applicant. • The appointment of the EHS Officer is dependent upon the project proceeding to the "construction" phase. •

5. MONITORING, COMMUNICATION AND REPORTING

5.1 Responsibilities for Environmental Management

The Contractor and / or its agents will be responsible for environmental management on site during the construction period. A pre-construction meeting is recommended in order to reach agreement on specific roles of the various parties and penalties for non-compliances with the EMPr. In addition, surrounding residents must be notified in advance of any potentially disturbing activities.

5.2 Environmental Awareness Training for Site Personnel

The EMPr shall be part of the Terms of Reference (ToR) for all Contractors, Sub-contractors and Suppliers. All the people involved in this project are to be briefed on their obligations towards environmental controls and methodologies in terms of this EMPr prior to work commencing. The briefing will take the form of an on-site presentation by the ECO. The education / awareness program should be aimed at all levels of the contractor team. New site personnel must attend an environmental awareness presentation. The EO must also conduct daily toolbox talks.

5.3 Complaints Register and Environmental Incident Register

Any complaints received from the community must be registered and recorded by the contractor on site. The complaint must be brought to the attention of the engineer and contractor, who will respond accordingly. The following information will be recorded:

- Time, date and nature of the complaint;
- Response and investigation undertaken; and
- Close Actions taken, success and closure date. All complaints received will be investigated and a response (even if pending further investigation) is to be given to the complainant within 7 days.

Incidents

Within 8 hours the EO will report to the Engineer and ECO the occurrence or detection of any incident at the site, or incidental to the operation of the site which has the potential to cause, or has caused, water pollution, damage to the environment, health risks or nuisance conditions, or which is a contravention of the Environmental Management Plan. Within 5 days (or shorter period of time) from the occurrence or detection of any incident, an action plan must be submitted with a detailed time schedule for implementation:

- To correct the impacts of the incident,
- To prevent the incident from causing any further impacts and
- To prevent the recurrence of a similar incident. The non-compliance forms and complaints register, together with actions taken or to be taken, are to be kept on file by the EO and made available to the ECO and engineer.

5.4 Site Instruction Entries

The site instruction book entries will be used for the recording of general site instructions as they relate to the construction/ upgrade works. It will also be used for the issuing of stop work orders for the purposes of immediately halting any particular activities of the contractor in lieu of the environmental risk that they may pose.

5.5 EO Diary Entries

The purpose of these entries will be to record the comments of the EO as they relate to activities on the site. Each of these books must be available in duplicate, with copies for the project manager and ECO. These books should be available to the authorities for inspection or on request. Minutes of all the meetings that reflect environmental queries, agreed actions and dates of eventual compliance must be available and form part of the official environmental record.

5.6 Method Statements

Method statements from the contractor will be required for specific sensitive actions on request of the authorities or ECO. A method statement forms the base line information on which sensitive area work takes place and is a "live document" in that modifications are negotiated between the Engineer, contractor and ECO as circumstances unfold. All method statements will include items from the EMPr. A method statement describes the scope of the intended work in a step by step description in order for the ECO to understand a contractor's intentions. This will enable them to assist in devising any mitigation measures, which would minimize environmental impact during these tasks. For each instance wherein it is requested that the contractor submit a method statement to the satisfaction of the ECO, the format should clearly indicate the following:

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

The contractor must submit method statements before any particular construction activity is due to start. Work may not commence until the method statement has been approved by the ECO and engineer. Allow a minimum of 14

days for approval of method statements. The following detailed and comprehensive method statements are likely to be required as relevant:

- Erosion control and run off control (storm water control); erosion rehabilitation
- Materials management
- Alien plant control and eradication
- Waste management, storage, handling and disposal
- Noise and dust control
- Social control
- Spill Contingency and Emergency Response
- Rehabilitation Should changes to the above occur, the ECO and engineer will then need to approve these again

5.7 Record Keeping

All records related to the implementation of this management plan (e.g. complaints register and incident book, site instruction book; EO diary; method statements) must be kept together in an office where it is safe and can be retrieved easily. These records should be available for scrutiny by any relevant authorities at any time.

5.8 Photographs

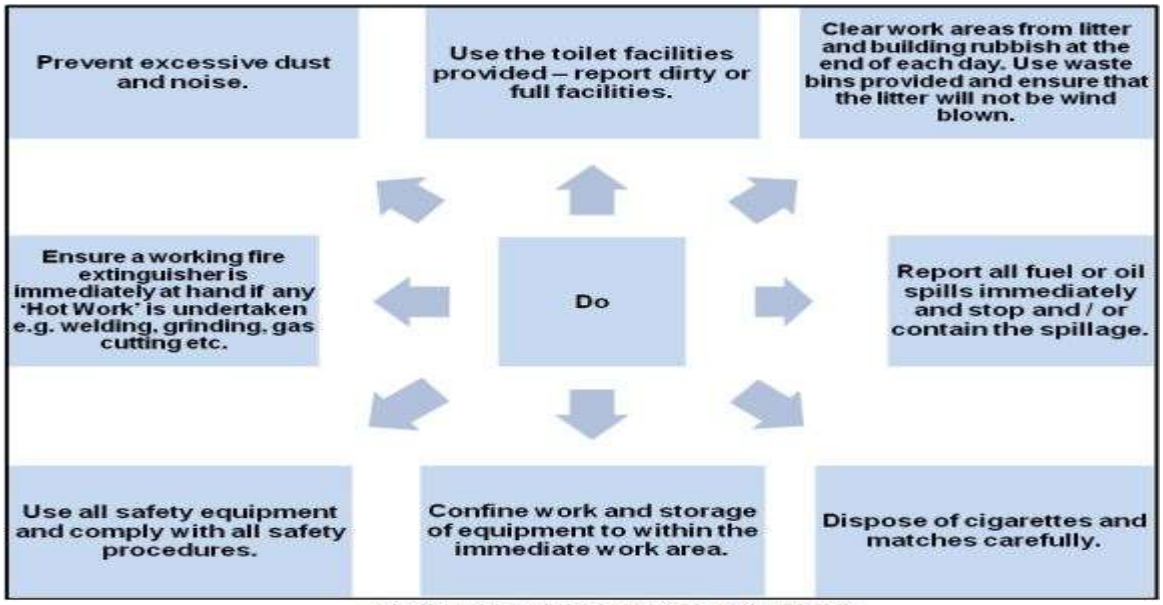
Photographs must be taken of the site prior to, during and immediately after construction as a visual reference, by the contractor. These photographs should be stored with other records related to this EMPr. If captured in digital format, hard copies must be kept with all other records relevant to the implementation of this EMPr.

5.9 Environmental Close Out Report

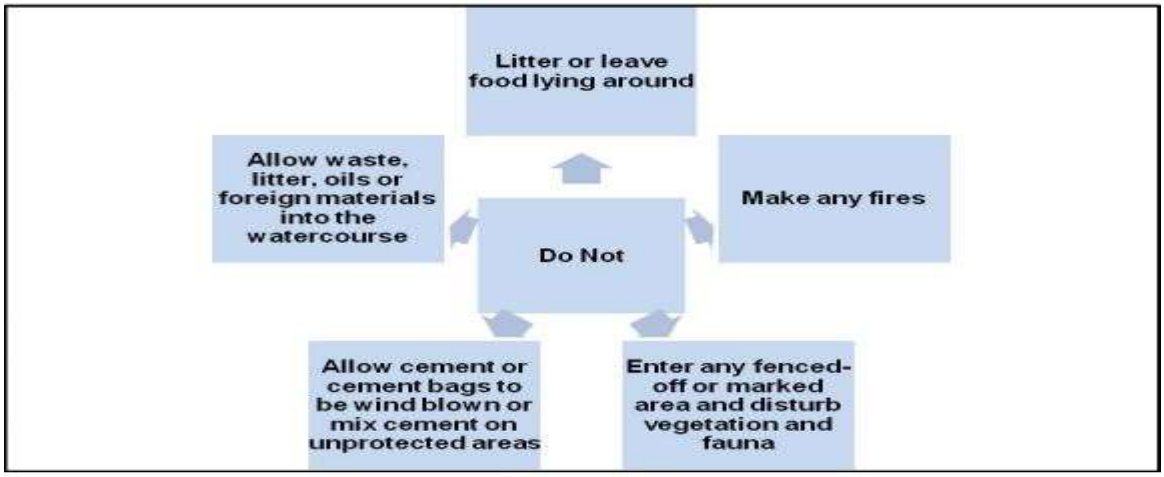
An environmental close out report is a report by the ECO to the relevant authorities stating completion of the project and overall compliance levels. This report will also comment on the impacts arisen during construction vs impacts predicted.

5.10 Basic Rules of Conduct

The following figures represent the do's and don'ts towards environmental awareness that all participants in this project must consider whilst carrying out their tasks. These are not exhaustive and serve as a quick reference aid:



Basic Rules of Conduct on Site (Do's)



Basic Rules of Conduct on Site (Dont's)

5.11 Environmental Monitoring Auditing, and reporting mechanism

Environmental monitoring will be undertaken by the Environmental Control Officer (ECO) on a monthly basis. Monitoring will be undertaken to ensure compliance with all aspects of the EMPr. In order to facilitate communication between the ECO, Engineer and Contractor, it is important that a suitable chain of command is structured that will ensure that the ECO's recommendations have the full backing of the project team before being conveyed to the Contractor. In this way, penalties as a result of non-compliances with the EMPr may be justified as a failure to comply with instruction from the highest authority. It is recommended that communication be via the Engineer. All findings will be presented in a written report and distributed to all parties, including the Competent Environmental Authority. The following auditing and monitoring and reporting protocol will be used:

- Initial analysis and review of the EMPr and Environmental Authorisation/ROD
- Review layouts and drawings
- Determine audit scope
- Onsite opening meeting
- Review documentation (EO file)
- Walk through site to observe construction related activity
- Stop at active work sites for in depth monitoring
- Onsite closing meeting
- Discuss findings on site with the Engineer and contractor's EO and specify mitigation or management measures
- Discuss significant issues of concern with the Engineers where relevant
- Prepare audit report for submission to client and contractor
- Recommend measures and opportunities for improvement
- Comment briefly on the various aspects on the affected environment including effectiveness of mitigation, method statements and plans.

Non-Compliance with the EMPr

Difficulties may be encountered with carrying out mitigation measures that could result in future noncompliance. The Contractor shall put in place procedures to motivate staff members to comply with the EMPr, and to deal with acts of non-compliance, or malicious damage to the environment. Penalties for non-compliance need to be discussed with the Contractor at the earliest stage (during the Pre-Construction Meeting). The Contractor is deemed not to have complied with the Environmental Management Plan if:

- within or without the boundaries of the site, site extensions and haul/ access roads there is evidence of contravention of clauses;
- if environmental damage ensues due to negligence or otherwise; the Contractor fails to comply with corrective or other instructions issued by the Engineer within a specified time,
- The Contractor fails to respond adequately to complaints from the public and calls for environmental mitigation

Amendments / Instructions

No EMPr amendments (relaxation or revision of any mitigation measure) shall be allowed without approval from the relevant authority (LEDET). Motivations for amendments to the EMPr may be discussed with ECO. However, the ECO may provide onsite input where required with regard to the mitigation measures required as per EMPr.

6. APPLICABLE LEGISLATION

The table below indicates the pieces of legislation applicable to the project as far as Environmental Management is concerned:

Title of legislation, policy or guideline	Administering authority	Date
National Environmental Management Act (NEMA)	Department of Environmental Affairs	2014
National Environmental Management: Waste Act	Department of Environmental Affairs	2010
National Environmental Management: Biodiversity Act	Department of Environmental Affairs	2004
National Water Act	Department of Water and Sanitation	1998
Integrated Environmental Management (IEM) (Department of Environmental Affairs: DEAT, 1992). IEM is a philosophy, which prescribes a code of practice for ensuring that environmental considerations are fully integrated into all stages of the development process. This philosophy aims to achieve a desirable balance between conservation and development.	Department of Environmental Affairs	1992
National Heritage Resources Act, 1999, (Act No. 25 of 1999).	South African Heritage Resources Agency and the Provincial Limpopo Heritage Resources Agency (LIHRA).	28 April 1999
Constitution of the republic of South Africa, Bill of Rights, Chapter 2: 7-39	The Constitutional Court (CC) of South Africa.	4 February 1997
National Water Act, 1998 (Act No. 36 of 1998)	Department of Water Affairs	1998
National Environmental Management: Waste Act (NEMWA), 2008 (Act No. 59 of 2008).	Department of Environmental Affairs	2008
Environment Conservation Act, 1989 (Act No. 73 of 1989)	Department of Agriculture and Fisheries	1989

Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965)		1965
Air quality Act, 2004 (Act No. 39 of 2004)		2004
Occupational health and Safety Act (OHSA), Act no 85 of 1993	Department of Labour	1993
Municipal By-Laws	Local	

6.1 ENVIRONMENTAL MANAGEMENT PROGRAMME

Impact/Aspect Description	Environmental objective	Management/Mitigation Measures	Monitoring Compliance and Reporting	Monitoring Frequency	Responsibility
Planning Phase					
Contractual matters and construction program	Contingencies for minimizing negative impacts Ensuring environmental awareness and formalising environmental responsibilities	• The EMPr must be included as part of the tender documentation, enforceable under the general conditions of contract. • A copy of the EMPr must be held on site. The contractor must ensure that all the personnel on site, sub-contractors and their team, suppliers, etc. are familiar with and understand the specifications contained in the EMPr. • Contractors shall prepare a source statement	Contract documents -Permits for materials	Contractor appointment, site establishment and ongoing as required	**Client/ Engineer/ Contractor**

		indicating the sources of all materials (including topsoil, sands, natural gravels, crushed stone, asphalt, clay liners etc), and submit these to the Engineer for approval prior to commencement of any work. This must also be filed. • Where possible, a signed document from the supplier of natural materials should be obtained confirming that they have been obtained in a sustainable manner and in compliance with relevant legislation • Work near the or on the crossings may not commence without a Water Use License from Department of Water and Sanitation			

Method statements	Contingencies for minimizing negative impacts -Ensuring environmental awareness and formalising environmental responsibilities	• Method statements as stated in this EMPr must be provided by the contractor. All activities which require method statements may only commence once the method statements have been approved by the engineer and or ECO as applicable. • It is vital that detailed construction method statements be compiled and submitted to the engineer and ECO for review, detailing method of working in the watercourses, diversion if any and mitigation for this; as well as method statements for road construction upgrade, spill contingency and emergency response		Site establishment and as required	**Contactor/ Environmental Control Officer/ Environmental Officer**

Emergencies	Contingencies for minimizing negative impacts	The contractor must provide method statements on the protocols to be followed, and contingencies to be put in place for the following potential incidents before construction may begin: Contamination of natural water resources from spills; contamination of soils from spills; and fire		Site establishment and as required	**Environmental Officer/Contractor**
Construction/Clearing Phase					
Loss of natural vegetation and habitats within the CBA	To minimise loss of vegetation, specifically in sensitive areas.	• Development planning must ensure loss of vegetation and disturbance is restricted to within the recommended site layout footprint.	• The Management to ensure development layout adheres to the proposed mitigation measures of this EMPr.	During planning and clearing phase	**Construction Manager/Environmental Control Officer**
Removal of flora (including species of conservation importance)	To prevent loss of species of conservation concern.	• Obtain permit removal/ relocation of listed NCO species • Conduct a search and rescue operation to recover and relocate	• **The contractor** to verify implementation of the mitigation measures proposed in this EMPr.	During planning	**Environmental Control Officer/ Environmental Officer and the appointed Ecologist**

		suitable wild flowers/ herbs • Avoid disturbance /activities outside of the direct footprint			
Faunal mortality and Disturbance (including possible conservation important species)	To prevent the mortality of species.	• Conduct focused surveys of terrestrial invertebrates (millipedes and snails) and herpetofauna (amphibians and reptiles) to determine presence and absence of sensitive species • Restrict and control the movement of people/vehicles outside of designated areas • As far as possible, the ECO should relocate fauna to suitable nearby habitat as and when encountered during earthworks	**The contractor** to verify implementation of the mitigation measures proposed in this EMPr.	During planning and clearing phase	**Environmental Control Officer/Environmental Officer/Ecologist**
Disturbance to fauna from noise, light and other disturbances	To prevent disturbance to fauna	• Minimise lighting on-site, use pressure sodium vapour lights/or LED lights, and angle/face into	**The contractor** to verify implementation of the mitigation measures proposed in this EMPr.	During planning and clearing phase	**Engineer/Environmental Officer**

		working areas. Infrared and/or sensor lights and security systems should be used as far as possible to limit need for permanent lighting. • Ensure minimal or no disturbance outside of footprint areas			
Loss of habitat integrity due to spread of IAPs	To prevent the spreading and increase of alien invasive species.	Develop and implement and invasive alien plant control programme, with routine follow-ups, monitoring, and should be implemented by a competent contractor (special care is essential when working within the riparian/aquatic environments)	**The contractor** to ensure that this is taken into consideration during the planning of the proposed development.	All phases	**Environmental Officer/Engineer**
Water quality impacts (including sedimentation) to the nearby watercourses	To prevent the loss and minimise the disturbance of natural habitats, and ultimately prevent the loss of ecosystem function on site.	• Method statements are required for waste management, hazardous material/waste management, spill contingency and protection, soil surface	• **The contractor** to verify implementation of the mitigation measures proposed in this EMPr. • ECO to ensure compliance.	During planning and construction	**Engineer/Environmental Control Officer/Environmental Officer**

		and groundwater protection • Disposing of hazardous materials or any other type of material or waste stream into the watercourse, near the watercourse or riparian area, in the open/natural environment, (including all types of rubble, spoil, waste rock, spills, waste, litter, garbage, plastics, excess material from blasts etc) is strictly prohibited. • Treat oil and chemical spills/residues immediately with an absorbent • Contractor must ensure that spill kit and drip drays are available on site • Contractor must ensure that emergency response plan is available			

		• Contractor must ensure that disposal slips are obtained after waste disposal has taken place at registered, legal disposal sites. These slips/receipts must be filed. **Ablutions** • Chemical toilets must be provided and are to be maintained in a clean state and should be sufficient in number to ensure that they adequately service the work area. • If chemical toilets are used then the waste should be serviced regularly with proof of servicing being retained on file. Care must be taken during servicing to avoid contamination of soils and			

		water pollution and nuisance to adjoining areas. • A registered chemical waste company is to be used to remove waste from chemical toilets. Servicing slips are required. • The Contractor is to ensure that open areas, the surrounding areas, and especially the watercourses are not being used as a toilet facility or washing purposes (personal, effects, implements). • Under no circumstance may sewage/waste from toilets be disposed of in the watercourse. **Waste water management**			

		• All concrete mixing must take place on a designated, impermeable and bunded surface • A designated, bunded area or workshop is to be set aside for vehicle washing and maintenance. **Hazardous materials** The contractor must provide and maintain a method statement for cement and concrete handling. The method statement must provide information on proposed storage, washing & disposal of cement, packaging, tools and plant. • Mixing of concrete on site is not recommended, however if unavoidable, it must be conducted only in			

		specifically selected sites on mortar boards or similar structures, on a designated, impermeable and bunded surface or on a metal drip tray and must occur out of the flood line or further than 32m away from watercourses, to contain run-off into soil, rocky outcrops, and watercourses. • Cleaning of cement mixing and handling equipment must be done using proper cleaning trays. • All empty cement bags are to be treated as hazardous waste and must not be discarded on the ground and the river; and must not be allowed to become windblown • All empty containers must be stored in a dedicated area and later removed			

		from the site for appropriate disposal at a licensed facility. • Any spillage of cement that may occur must be investigated and immediate remedial action must be taken. • The visible remains of concrete, either solid, or from washings, must be physically removed immediately and disposed of as waste to a registered landfill site • No vehicle transporting concrete may be washed on site • Vehicle servicing must occur in a bunded area or workshop area, further than 100m from site • All substances required for vehicle maintenance and repair must be stored in sealed containers until		

		they can be removed from site. • Storage of hazardous substances within bunded area, and away from buffer areas. • Hazardous waste disposal must be carried out by an approved waste contractor. • Storage areas that contain hazardous substances must be bunded with an approved impermeable layer. • A sump (earth or other) must be created for concrete waste. This is to be dislodged regularly and the cement waste is to be removed to a tip site as approved, by the local solid waste company that is in charge of that particular area.			

		• Storage areas containing hazardous substances/materials must be clearly signed. • Safety Data Sheets (SDSs) should be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, SDSs should additionally include information on ecological impacts and measures to minimise negative environmental impacts during accidental spill releases or escapes. • Emergency numbers should be put up on site and consulted should any accidents / spillages of hazardous substances and / or materials take place.			

		• The Contractor is to outline a method statement for the dealing of accidents / spillages of hazardous materials or substances. This statement must be handed to the Engineer as well as to DWS should the incident occur near a watercourse • Treat oil and chemical spills/residues immediately with an absorbent **Chemical spills** • Contain chemical spills and arrange for clean-up / control by the supplier or by professional pollution control personnel or use of a spill kit by trained personnel Oil and Fuel spills			

		• A spill kit must be held on site. • Store potential contaminants appropriately within the site camp area. Drip trays are required for all plant / machinery / equipment that uses hydrocarbons. • Check vehicles for leaks regularly. If left standing near the river over night or for more than 8 hours ensure a drip tray is placed under the vehicle's engine • Servicing should be done ideally off site, but if unavoidable • The area that houses the construction camp is to be checked for spills of substances such as oil, paint etc. and these should be cleaned up. • Immediately clean up any accidental oil or fuel spills			

		or leakages Do not hose oil or fuel spills into the surrounding natural environment or watercourse • Clean small oil or fuel spills with an approved absorbent material, such as 'Drizit' or 'Spill-sorb'. • Contain oil or fuel spills in water using an approved oil absorbent fibre. • Treat soil contaminated by oil or fuel using one of the following approved methods, as per instruction of the Engineer: • Remove the soil to the depth of the contamination and dispose of it at a registered Hazardous **Waste Disposal Site**. Remove the soil to the depth of the contamination, and			

		regenerate it by using approved bio-remediation methods. In the event of a spillage/incident that cannot be contained and which poses a serious threat to the local environment, and human health, the following Departments must be informed of the incident in accordance with Section 30 of NEMA, 1998: to the Local Authority; DWS; DEA and the local Fire Department.			
Waste generated from Construction	To prevent Environmental pollution and contamination	**Green waste** • Green waste, vegetation cleared as part of this project, must be stored in a container that is wind, water and scavenger proof. **General waste** • To ensure that waste generated does not detract from the aesthetics of the surrounding	• **The contractor** to verify implementation of the mitigation measures proposed in this EMPr. • **ECO** to ensure compliance.	During construction and Planning	**Engineer/Environmental Officer**

		environment, general waste must be stored in containers that are wind, water and scavenger proof. These containers must be located on a level surface that is in excess of 32m from water resources. **Effluent** • A chemical toilet must be provided for every 15 workers on site. This toilet must be secured to the ground on a level surface that is sheltered from the elements in order to prevent it from toppling over. A maintenance schedule for the removal and cleaning of these toilets must be established in order to ensure that sufficient ablution facilities for the construction staff are maintained at all times. These toilets must be			

		locked at the end of each day, and every effort must be taken to ensure that animals cannot gain access to these toilets. Sufficient toilet paper must be made available.			
Noise disturbance as a result of tractor and/or machinery activities.	To prevent noise generation on site.	• Activities that will generate the most noise should be limited to during the day in order to minimise disturbance to the neighbours. • The noise created by the proposed activities is not expected to be significant, given the agricultural nature of the area. If required, noise reduction measures will have to be implemented in compliance with the Noise Regulations. • No sound amplification equipment to be used on	ECO to ensure compliance and reporting thereof.	During the clearing phase	**Engineer/Environmental Officer**

		site, except in emergency situations. • Limit vehicles travelling to and from the site to minimise traffic noise to the surrounding environment. • A complaints register should be kept on site, with records of complaints received and manner in which the			
Degradation of ambient air quality as a result of dust and other emissions generated.	To minimise the impact on the ambient air quality as a result of development activities.	• Implement effective and • Environmentally friendly dust control measures, such as mulching or periodic wetting of the exposed areas. • Clearing should be done in a strategic manner to avoid large areas of non-stratified soils.	• Air emissions to be monitored throughout the construction phase. • Ensure regular maintenance of construction vehicles to allow for 'cleaner' emissions from these vehicles, including equipment maintenance.	Daily during the clearing phase	**Engineer/Environmental Officer**

Impact on features of Heritage importance.	To protect heritage resources.	• Should any features of heritage be identified on site, these should not be disturbed; all development should cease until further notice and would be immediately reported to a Heritage specialist SAHRA • No structures older than sixty years or parts thereof are allowed to be • demolished altered or extended without a permit from SAHRA	Report any features of Heritage significance.	N/A	**Environmental Officer/Appointed Heritage Specialist**
Operational Phase					
Faunal mortality and Disturbance including possible conservation important species)	To minimise mortality and disturbance to fauna.	Restrict and control the movement of people/vehicles outside of operational/working areas	**The contractor** to verify implementation of the mitigation measures. Proposed in this EMPr.	When necessary During operation	**Construction Manager/Environmental Control Officer**
Disturbance to fauna from noise, light and other disturbances	To prevent the loss and Minimise the disturbance of natural habitats, and ultimately prevent the loss	• Minimise lighting on-site, use pressure sodium vapour lights/or LED lights, and angle/face into	**The contractor to** verify implementation of the mitigation measures proposed in this EMPr.	Regular inspection every six months	**Construction Manager/Environmental Control Officer**

	of ecosystem function on site.	working areas. Infrared and/or sensor lights and security systems should be used as far as possible to limit need for permanent lighting. • Ensure minimal or no disturbance outside of footprint areas	ECO to develop a management plan to prevent faunal disturbance and displacement. An assessment should be undertaken to determine and monitor sensitive		
Loss of habitat integrity due to spread of IAPs	To prevent the spreading and increase of alien invasive species.	Develop and implement and invasive alien plant control programme, with routine follow-ups, monitoring, and should be implemented by a competent contractor (special care is essential when working within the riparian/aquatic environments).	ECO to verify that mitigation measure proposed in this EMPr are implemented and submit a report thereof on a monthly basis.	When necessary during operation	**Construction Manager/Environmental Control Officer**
Water quality impacts (including sedimentation) to the Watercourses system	The avoidance of water quality detriment.	• Avoid all riparian areas and adjacent land up to a minimum of 20m from the • riparian boundary • Extent the minimum buffer area up to 135m to maximise the buffering functions and processes	Regular monitoring and site inspections to be conducted and ensure adherence to this EMPr.		**Engineer/Environmental Control Officer/Environmental Officer**

		for the Watercourses (high ecological importance; • very high ecological sensitivity) • Limit earthworks to the winter season			
Noise disturbance as a result of tractor/loader and/or Machinery activities.	To minimise noise generation on site.	• Activities that will generate the most noise should be limited to during the day in order minimise disturbance to the neighbours. • The noise created by the proposed activities is not expected to be significant, given the agricultural nature of the area. If required, noise reduction measures will have to be implemented in compliance with the Noise Regulations. • No sound amplification equipment to be used on site, except in emergency situations.	• ECO to ensure compliance and reporting thereof. • A complaints register must be kept on the farm, in which any noise complaints from the public must be logged.	Daily during the operation phase	**Engineer/Environmental Control Officer/Environmental Officer**

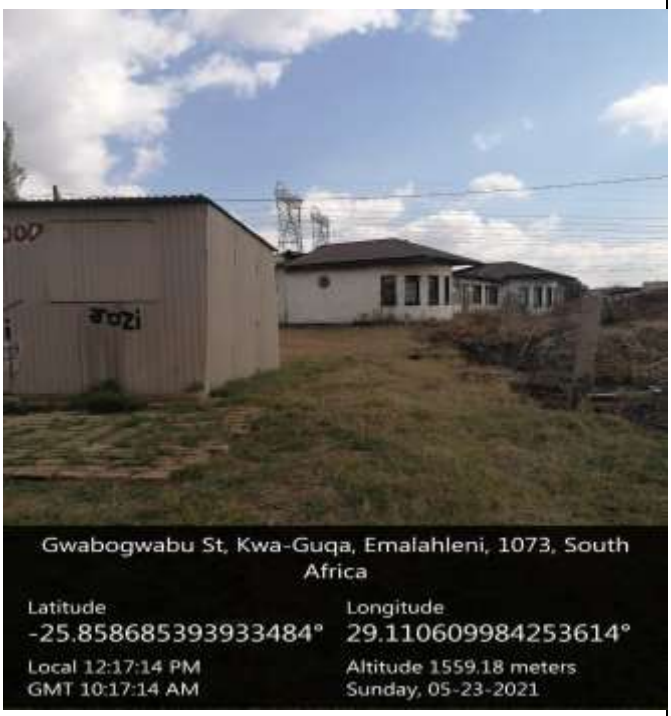
		• Limit vehicles travelling to and from the site to minimise traffic noise to the surrounding environment. • A complaints register should be kept on site, with records of complaints received and manner in which the complaint was addressed.			
Degradation of ambient air quality as a result of dust and other emissions generated.	To minimise the impact on the ambient air quality as a result of development activities.	• Implement effective and environmentally friendly dust control measures, such as mulching or periodic wetting of the exposed areas. • Clearing should be done in a strategic manner to avoid large areas of non-stratified soils.	• Air emissions to be monitored throughout the operation phase. • Ensure regular maintenance of construction vehicles to allow for 'cleaner' emissions from these vehicles, including equipment maintenance. • Monitor traffic control measures and report noncompliance.	Daily during the operation phase	**Engineer/Environmental Control Officer/Environmental Officer**

			• A complaints register must be kept on the farm, in which any dust complaints from the public must be logged.		
Potential injury to workers and safety being compromised due to handling equipment, machinery, and health issues as a result of smoke emissions.	To protect workers' safety.	Worker to wear Personal Protective Equipment (PPE).	EHS to create safety awareness and monitor noncompliance.	Daily during all phases	**Safety Officer/Engineer**

7. CONCLUSION

This EMPr is ensuring that impacts associated with the development are kept to a minimum level. This EMPr has been prepared as “stand alone” document to be used as the basis for actively managing the activities as projects progress. This document outlines the overarching performance criteria, control strategies and corrective actions proposed accordingly. On balance, the benefits of the potential positive project impacts for the local community and beyond, namely vegetation conservation and protection of endangered species; scenery improved and cost savings to the facility users, are considered to outweigh the disadvantages of the potential minimum negative impacts.

PHOTOGRAPHIC EVIDENCE

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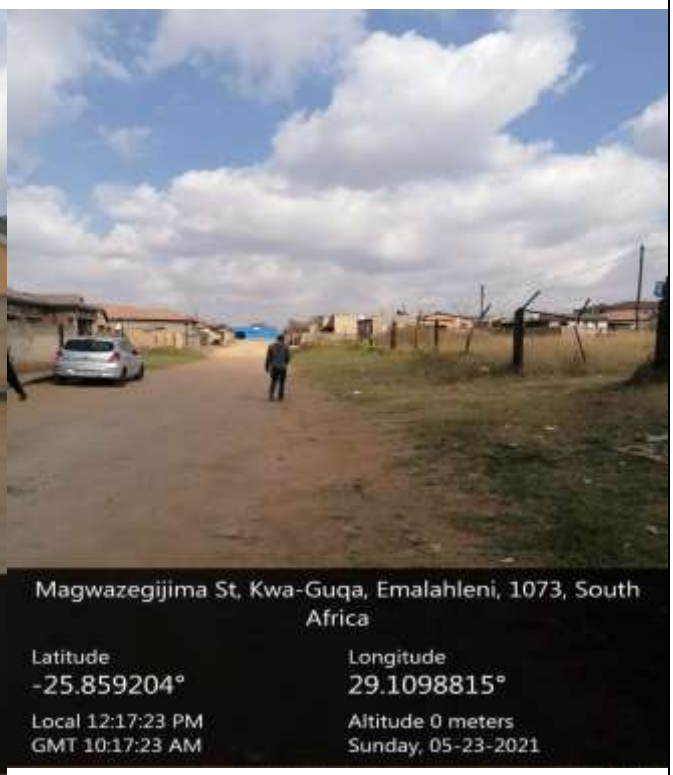
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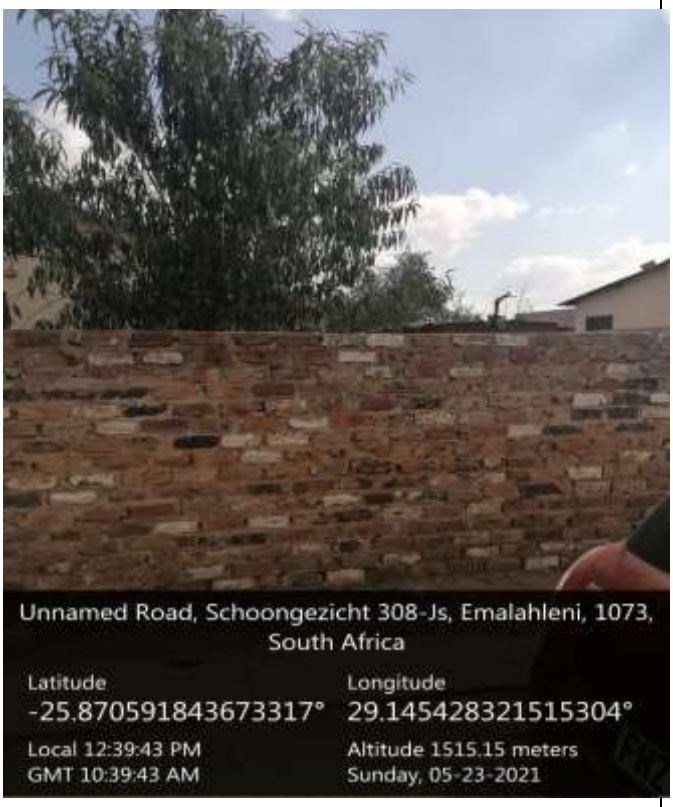
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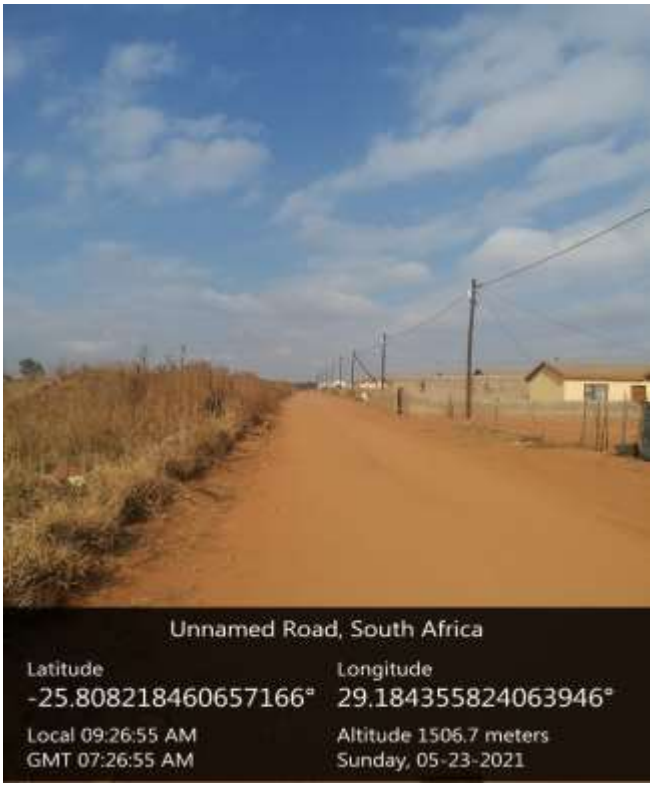
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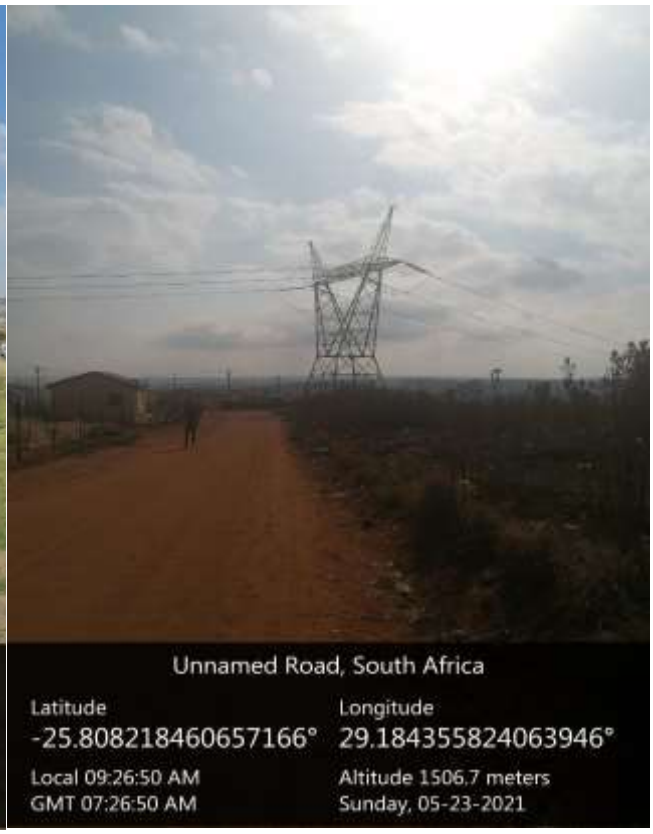
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