Nali
Sustainability Solutions (Pty) Ltd
Environmental and Development Consultants

ENVIRONMENTAL MANAGEMENT PROGRAMME

PROPOSED CULVERT BRIDGE RIETSPRUIT WATERCOURSE CROSSING – KOSMOSDAL DEVELOPMENT

PART OF THE REMAINDER OF PORTION 2 OF THE FARM 249 OF THE FARM OLIEVENHOUTBOSCH 389 JR, CITY OF TSHWANE METROPOLITAN MUNICIPALITY

AUTHORITY REFERENCE: GAUT 006/26-27/E0002

SAMRAND DEVELOPMENT PROPRIETARY LIMITED

JUNE 2026

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DEFINITIONS

In this EMPr, any word or expression to which a meaning has been assigned in the NEMA or EIA Regulations has that meaning, unless the context requires otherwise –

"clearing" means the clearing and removal of vegetation, whether partially or in whole, including trees and shrubs, as specified;

"**construction camp**" is the area designated for critical construction infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;

"**contracto**r" - The Contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the Environmental Management Programme and that Method Statements are implemented as described.

"**hazardous substance**" is a substance governed by the Hazardous Substances Act, 1973 (Act No. 15 of 1973) as well as the Hazardous Chemical and Substances Regulations, 1995;

"**method statement**" means a written submission by the Contractor to the Project Manager in response to this EMPr or a request by the Project Manager and ECO. The method statement must set out the equipment, materials, labour, and method(s) the Contractor proposes to use to carry out an activity identified by the Project Manager when requesting the Method Statement. This must be done in such detail that the Project Manager and ECO can assess whether the Contractor's proposal as per this specification and/or will produce results per this specification;

The method statement must cover applicable details about:

(i) Construction procedures;
(ii) Plant, materials and equipment to be used;
(iii) Transporting the equipment to and from the site;
(iv) How the plant/material/equipment will be moved while on site;
(v) How and where the plant/material/equipment will be stored;
(vi) The containment of leaks or spills of any liquid or material that may occur;
(vii) Timing and location of activities;
(viii) Compliance/non-compliance; and
(ix) Any other information deemed necessary by the Project Manager.

"**slope**" means the inclination of a surface expressed as one unit of rise or fall for so many horizontal units;
"**solid waste**" includes construction debris, hazardous waste, excess cement/concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers);

"**spoil"** means excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works;

"**topsoil"** means a varying depth (up to 300mm) of the soil profile irrespective of the fertility, appearance, structure, agricultural potential, fertility, and composition of the soil and

"**works**" means the works to be executed in terms of the Contract.

ACRONYMS AND ABBREVIATIONS

CA	Competent Authority
cEO	Contractors Environmental Officer
dEO	Developer Environmental Officer
DPM	Developer Project Manager
DSS	Developer Site Supervisor
EAR	Environmental Audit Report
ECA	Environmental Conservation Act No. 73 of 1989
ECO	Environmental Control Officer
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
ERAP	Emergency Response Action Plan
EMPr	Environmental Management Programme Report
EAP	Environmental Assessment Practitioner
FPA	Fire Protection Agency
HCS	Hazardous chemical Substance
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
MSDS	Material Safety Data Sheet
RI&APs	Registered interested and affected parties

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1 INTRODUCTION AND BACKGROUND

1.1 Background

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) requires that an environmental management programme (EMPr) be submitted where an environmental impact assessment (EIA) has been identified as the ecological instrument to be utilised as the basis for a decision on an application for environmental authorisation (EA). The content of an EMPr must either contain the information set out in Appendix 4 of the Environmental Impact Assessment Regulations, 2014, as amended (EIA Regulations) or be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice.

The applicant, Samrand Development Proprietary Limited, proposes to change from an approved span bridge to a culvert bridge Rietspruit Watercourse Crossing – Kosmosdal Development, located on Part of the Remainder of Portion 2 of the Farm 249 of the Farm Olievenhoutbosch 389-JR, City Of Tshwane Metropolitan Municipality.

The proposal entails the installation of five (10) 3.0m x 2.4m precast box culverts stormwater bridge. This installation will enable the development of a road crossing of existing wetlands and flood lines of the non-perennial Rietspruit. This road crossing will also accommodate the flood run-off.

The bridge installation entails the following:

- Temporary deviation of water course;
- Preparation of embankment footprints and bedding for culvert construction and other hydraulic structures;
- Construction of Precast Rectangular Portal Frame Culverts,
- Imported filling;
- Embankment protection;
- Erosion control and protection;
- Rehabilitation and reinstatement to original state, and
- A temporary crossing will be needed for transportation and traffic to cross the natural water course.

1.2 [2]Site Location and Layout

The proposed culvert bridge forms part of the approved Kosmosdal Extension 92 mixed-use township development. Rietspruit is located on the eastern side of the proposed Kosmosdal X103 township, flowing in a northern direction, passing Rossway Quarry to the east of the Rietspruit and crossing under the N14.

The bridge development footprint consists of Ten (10) Box Culverts, 3.0m x 2.4m.

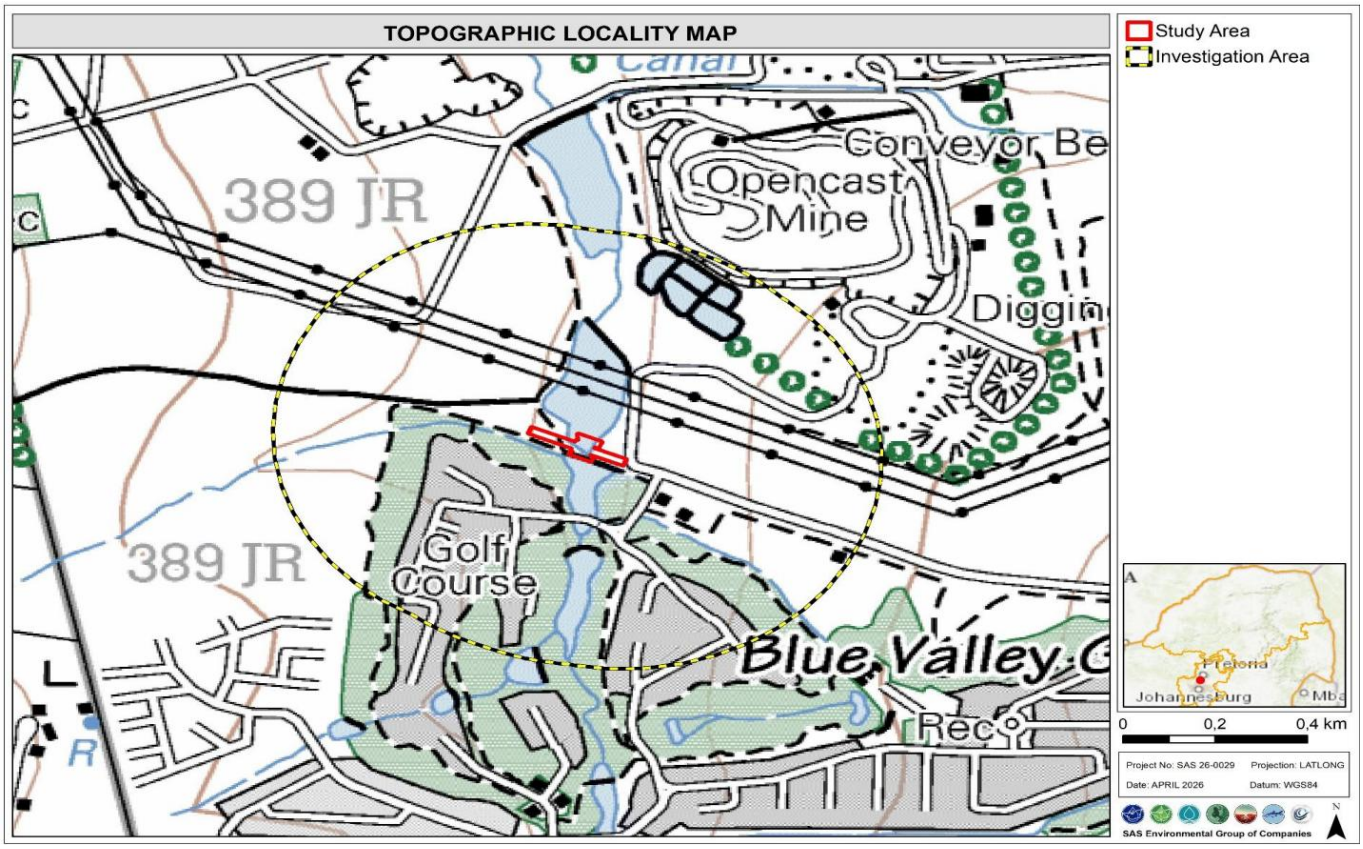

Figure 1: Locality Map

1.3 Layout Plan

The layout plan considered the development constraints and opportunities presented by the site. These include the shape of the land, adjacent land uses, the need for efficiency in land allocation in relation to infrastructure services, specialists' recommendations, and inherent environmental sensitivities associated with the watercourse and flood line condition

Figure 2: Layout Plan

1.4 Details of the Applicant

Table 1: Details of the Applicant

Aspect	Details
Applicant	Samrand Development (Pty) Ltd
Representative	Miguel Tavares
Designation	Manager
Address	P.O. Box 40037, Cleveland
Telephone	011 622 3026 Cell: +27 83 626 1449
Email address	miguel@cavaleros.co.za

1.5 Details of the EAP

To ensure full compliance with the EIA Regulations, 2014, promulgated under section 24 (5) of the National Environmental Management Act, 1998 NEMA (Act No. 107 of 1998) (NEMA) and environmental best practice, Samrand Development (Pty) Ltd appointed Nali Sustainability Solutions (Pty) Ltd as the independent Environmental Assessment Practitioner (EAP) to manage the application process. Details of the EAP are provided below.

Table 2: Details of the EAP

Aspect	Details
Name	Nali Sustainability Solutions (Pty) Ltd
Lead EAP	Mr Pirate Ncube (Lead)
Physical Address	65 Country Club Drive, Irene Farm Villages, Centurion
Postal Address	P Bag X1, Stand 1829, Irene Farm Villages, Centurion, 0045
Other contact details	**Tel:** 0824517120; Fax: 086 694 1178 - **Email:** ncube.nali@gmail.com
Expertise/ experience	Registered EAP with over 30 years of experience in environmental management, including environmental impact assessments and reviews, ecological management plans, and environmental compliance monitoring and reporting. Served in various bodies, including the DFA Tribunal, Environmental Advisory Committee, and MEC Appeals Advisory Panel. A qualified Town Planner with a master's in real estate and an MBA.

2 PURPOSE, SCOPE AND OBJECTIVES OF THE EMPR

2.1 Purpose and Objectives of the EMPr

An EMPr can be defined as "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". EMPrs are, therefore, essential tools for ensuring that the management actions arising from Environmental Impact Assessment (EIA) processes are clearly defined and implemented through all phases of the project life cycle.

The objectives of an EMP should include:

- Ensuring compliance with regulatory authority stipulations and guidelines, which may be local, provincial, national and/or international;
- Ensuring that there is sufficient allocation of resources on the project budget so that the scale of EMP-related activities is consistent with the significance of project impacts;
- Verifying environmental performance through information on impacts as they occur;

- Responding to changes in project implementation not considered in the EIA;
- Responding to unforeseen events; and
- Providing feedback for continual improvement in environmental performance

2.2 Scope of the EMPr

To achieve the above-stated objectives, the scope of an EMPr includes the following:

- Definition of the environmental management objectives to be realised during the life of a project (i.e. pre-construction, construction, operation and/or decommissioning phases) to enhance benefits and minimise adverse environmental impacts.
- Detailed actions needed to achieve the objectives, including how they will be achieved, by whom, by when, with what resources, with what monitoring/verification, and to what target or performance level. Mechanisms must also be provided to address changes in the project implementation, emergencies or unexpected events, and the associated approval processes.
- Institutional structures, roles, communication and reporting processes required to implement the EMP.
- Description of the link between the EMP and associated legislated requirements.
- Description of requirements for record-keeping, reporting, review, auditing, and updating the EMP.

3 ROLES AND RESPONSIBILITIES

Effective implementation of the EMPr depends on established and clear roles, responsibilities, and reporting lines within an institutional framework. This section details the various environmental roles and reporting lines. However, if no specific person, for example, an environmental control officer (eCO), is appointed, the holder of the EA remains responsible for ensuring that the duties indicated in this document for action by the eCO are undertaken.

Table 1: Guide to roles and responsibilities for the implementation of an EMPr

Responsible Person(s)	**Role and Responsibilities**
Developer's Project Manager (DPM)	Role The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). Where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent. Responsibilities - Be fully conversant with the conditions of the EA. - Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s). - Issuing site instructions to the Contractor for corrective actions is required. - Monitor the implementation of the EMPr throughout the project using site inspections and meetings. - Overall management of the project and EMPr implementation; and - Ensure periodic environmental performance audits are undertaken during the project's implementation.
Responsible Person(s)	**Role and Responsibilities**
Developer's Project Manager (DPM)	Role The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). Where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent.

	Responsibilities - Be fully conversant with the conditions of the EA. - Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s). - Issuing site instructions to the Contractor for corrective actions is required. - Monitor the implementation of the EMPr throughout the project using site inspections and meetings. - Overall management of the project and EMPr implementation; and - Ensure periodic environmental performance audits are undertaken during the project's implementation.
Developer Site Supervisor (DSS)	Role The DSS reports directly to the DPM, oversees site works, and liaises with the contractor(s) and the ECO. The DSS is responsible for the day-to-day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMPr. Responsibilities - Ensure all contractors identify a contractor's Environmental Officer (eCO). - Must be fully conversant with the conditions of the EA. Oversees site works and liaises with Contractor, DPM and eCO. - Must ensure that all landowners have the relevant contact details of the site staff, eCO, and - Issuing site instructions to the Contractor for corrective actions required. - Will issue all non-compliances to contractors; and - Ratify the Monthly Environmental Report.
Environmental Control Officer (ECO)	Role - The ECO should have appropriate training and experience implementing environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems, suggest mitigation and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. - The ECO provides feedback to the DSS and Project Manager regarding all environmental matters. The Contractor, eCO and dEO are answerable to the Environmental Control Officer for non-compliance with the Performance Specifications set out in the EA and EMPr. - The ECO provides feedback to the DSS and Project Manager, who reports to the Contractor and potential and Registered Interested & Affected Parties (RI&AP's), as required. Issues of non-compliance raised by the eCO must be taken up by

	the Project Manager and resolved with the Contractor as per the conditions of his contract. Decisions regarding environmental procedures, specifications, and requirements with a cost implication (i.e., those deemed to be a variation, not allowed for in the Responsible Person(s) Role and Responsibilities Performance Specification) must be endorsed by the Project Manager. - The ECO must also, as specified by the EA, report to the relevant CA as and when required. <u>Responsibilities</u> The responsibilities of the ECO will include the following: - Be aware of the findings and conclusions of all EA related to the development. - Be familiar with the recommendations and mitigation measures of this EMPr. - Be conversant with relevant environmental legislation, policies and procedures and ensure compliance. - Undertake regular and comprehensive site inspections/audits of the construction site according to the generic EMPr and applicable licenses to monitor compliance as required. - Educate the construction team about the management measures in the EMPr and environmental licenses. - Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective. - Monitor the performance of the Contractors and ensure compliance with the EMPr and associated Method Statements. - In consultation with the Developer, the Site Supervisor orders the removal of person(s) and/or equipment that contravene the specifications of the EMPr and/or environmental licenses. - Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns; - Compile a regular environmental audit report highlighting any non-compliance issues and satisfactory or exceptional compliance with the EMPr. - Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO). - Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc.) and corrective and preventive actions. - Checking the cEO's public complaints register in which all complaints are recorded and action is taken. - Assisting in the resolution of conflicts. - Facilitate training for all personnel on the site. This may range from carrying out the training to reviewing the Contractor training programmes. - In case of non-compliance, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the

	authorities as non-compliance. - Maintenance, update and review of the EMPr. - Communicate all modifications to the EMPr to the relevant stakeholders.
developer Environmental Officer (dEO)	<u>Role</u> The dEO will report to the Project Manager and is responsible for implementing the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners and a range of environmental coordination responsibilities. <u>Responsibilities</u> - Be fully conversant with the EMPr. - Be familiar with the recommendations and mitigation measures of this EMPr and implement these measures. - Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees and Contractor(s). - Confine the development site to the demarcated area. - Conduct environmental internal audits regarding EMPr and authorisation compliance (on). - Assist the contractors in addressing environmental challenges on site. - Assist in incident management. - Report environmental incidents to the developer and ensure corrective action is taken, and lessons learnt shared. - Assist the contractor in investigating environmental incidents and compile investigation reports. - Follow-up on pre-warnings, defects, non-conformance reports. - Measure and communicate environmental performance to the Contractor. - Conduct environmental awareness training on-site together with ECO and - Ensure that the necessary legal permits and/or licenses are in place and up to date. - Acting as Developer's Environmental Representative on site and working with the eCO and contractor.
Contractor	<u>Role</u> The Contractor appoints the and is responsible for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr while performing the onsite activities per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion of substation infrastructure for the transmission and distribution of electricity activities.

	Responsibilities - Project delivery and quality control for the development services as per appointment. - Employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site during the construction period. - Implement safe, environmentally acceptable working methods and practices. Also, ensure that equipment is operated correctly and maintained to facilitate proper access and enable any operation to be carried out safely. - Attend on-site meeting(s) before activities commence to confirm the procedure and designated activity zones. - Ensure that contractors' staff repair, at their own cost, any environmental damage caused by contravention of the specifications contained in EMPr, to the satisfaction of the eCO.
contractor Environmental Officer cEO	Role Each Contractor affected by the EMPr should appoint a cEO responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent, site engineer, dedicated environmental officer, or an independent consultant. The Contractor must ensure that the Contractor's Representative is 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 Environmental Control Officer, and the public. As a minimum, the eCO shall meet the following criteria: Responsibilities - Be on-site throughout the project and be dedicated to the project. - Ensure all their staff know the environmental requirements, conditions and constraints concerning their activities on site. - Implement the environmental conditions, guidelines and requirements stipulated in the EA, EMPr and Method Statements. - Attend the Environmental Site Meeting. - Undertake corrective actions where non-compliances are registered within the stipulated timeframes. - Report back formally on the completion of corrective actions. - Assist the ECO in maintaining all the site documentation. - Prepare the site inspection and corrective action reports for submission to the ECO. - Assist the ECO with preparing the monthly report and - Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint its representative.

4 DOCUMENTATION AND REPORTING

Appropriate documentation, reporting systems, information controls, and compliance mechanisms must be in place for the implementation of the project. As a minimum, these requirements must provide for accountability and ensure understanding when implementing the EMPr.

4.1 Document Control System

The holder of the EA is responsible for the upkeep and management of the Environmental file. At a minimum, all documentation detailed below will form part of the file. A hard copy of documentation shall be filed, while an electronic copy may be kept where relevant. A duplicate file may be maintained in the DSS office (where applicable). This duplicate file must remain current and up to date. The filing system must be updated, and relevant documents must be kept as required. The file must be made available at the request of the CA or other appropriate authorities. The availability and completeness of the file will be checked during the environmental audits prescribed in the EIA Regulations.

4.2 Documentation to be Available

At the outset of the project, the following preliminary list of documents should be placed in the filing system and be always accessible:

- Full copy of the signed EA from the CA in terms of NEMA, approving the development or expansion;
- Copy of the generic and site-specific EMPr as well as any amendments thereof;
- Copy of declaration of implementing generic EMPr and subsequent approval of site-specific EMPr and amendments thereof;
- All method statements;
- Completed environmental checklists;
- Minutes and attendance register of environmental site meetings;
- An up-to-date environmental incident log;
- A copy of all instructions or directives issued;
- A copy of all corrective actions signed off. The corrective actions must be filed in such a way that an explicit reference is made to the non-compliance record;
- Complaints register.

4.3 Weekly Environmental Checklist

Depending on the scheduling of site monitoring, the ECO may complete a Weekly Environmental Checklist, the format of which is to be agreed upon before the commencement of the activity. The ECOs must sign and date the checklist, retain a copy and submit a copy of the completed checklist to the DSS after each visit.

The checklists will form the basis for the Monthly Environmental Reports. As required in the EIA regulations, copies of all completed checklists will be attached as Annexures to the Environmental Audit Report.

4.4 Environmental Site Meetings

Should environmental site meetings be held, the minutes of such meetings shall be kept. The minutes must include an attendance register and will be attached to the Monthly Report distributed to attendees. Each set of minutes must record "Matters for Attention" that will be reviewed at the next meeting.

4.5 Required Method Statements

The method statement will be done in such detail that the ECOs are enabled to assess whether the contractor's proposal is per the EMPr.

The method statement must cover applicable details about:

- development procedures;
- materials and equipment to be used;
- getting the equipment to and from the site;
- how the equipment/material will be moved while on site;
- how and where the material will be stored;
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- timing and location of activities;
- compliance/non-compliance with the EMPr; and
- any other information deemed necessary by the ECOs.

Unless indicated otherwise by the Project Manager, the Contractor shall provide the following method statements to the Project Manager no less than 14 days before the commencement date of the activity:

- Site establishment – Camps, Lay-down or storage areas, satellite camps, infrastructure;
- Batch plants;
- Workshop or plant servicing;
- Handling, transport and storage of Hazardous Chemical Substances;
- Vegetation management – Protected, clearing, aliens, felling;
- Access management – Roads, gates, crossings etc.;
- Fire plan;
- Waste management – transport, storage, segregation, classification, disposal (a l waste streams);
- Social interaction – complaints management, compensation claims, access to properties, etc.;
- Water – use (source, abstraction and disposal), access and all related information, crossings and mitigation;
- Emergency preparedness – Spills, training, other environmental emergencies;
- Dust and noise management methodologies;
- Fauna interaction and risk management – only if the risk was identified – wildlife interaction, especially on game farms; and
- Heritage and palaeontology management.

The ECOs shall monitor and ensure contractors perform according to these method statements. Completed and agreed-upon method statements between the holder of the EA and the contractor should be retained in a file.

4.6 Environmental Incident Log (Diary)

The ECO is required to maintain an up-to-date and current Environmental Incident Log (environmental diary). The Environmental Incident Log is a means to record all environmental incidents, and non-compliance notices would not be issued. An environmental incident is defined as:

- Any deviation from the listed impact management actions (listed in this EMPr) that may be addressed immediately by the ECOs. (For example, a contractor's staff member littering or a drip tray that has not been emptied);
- Any environmental impact resulting from an action or activity by a contractor in contravention of the environmental stipulations and guidelines listed in the EMPr which, as a single event, would have a minor impact but which, if cumulative and continuous, would have a significant effect (for example no toilet paper available in the ablutions for an afternoon); and
- General environmental information such as road kills or injured wildlife.

The ECOs are to record all environmental incidents in the Environmental Incident Log. All incidents, regardless of severity, must be reported to the Developer. The Log is to be kept in the EMPr file, and at a minimum, the following will be recorded for each environmental incident:

- The date and time of the incident;
- Description of the incident;
- The name of the Contractor responsible;
- The incident must be listed as significant or minor;
- If the incident is listed as significant, a non-compliance notice must be issued and recorded in the log;
- Remedial or corrective action taken to mitigate the incident; and
- Record of repeat minor offences by the same contractor or staff member.

The Environmental Incident Log will be captured in the EAR.

4.7 Non-Compliance

A non-compliance notice will be issued to the responsible contractor by the ECOs via the DSS or Project Manager. The non-compliance notice will be issued in writing; a copy will be filed in the EMPr file and will, at a minimum, include the following:

- Time and date of the non-compliance;
- Name of the contractor responsible;
- Nature and description of the non-compliance;
- Recommended/required corrective action; and
- Date by which the corrective action is to be completed.

The contractors shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the development site about the environment shall be recorded in a dedicated register, and the response noted with the date and action taken. The ECO should be made aware of any complaints. Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define how the environment is managed. Failure to redress the cause shall be reported to the relevant CA so it can deal with the transgression as it deems fit. The

contractor is deemed not to have complied with the EMPr if, among other things, there is a deviation from the environmental conditions, impact management outcomes and impact management actions activities, as approved in generic and site-specific EMPr as relevant as set out in the EMPr, which deviation has, or may cause an environmental impact.

4.8 Corrective Action Records

For each non-compliance notice issued, a documented corrective action must be recorded. On receiving a non-compliance notice from the DSS, the contractors will ensure that the required corrective actions occur within the stipulated timeframe. On completion of the corrective action, the cEO will issue a written corrective action report to the ECOs. If satisfied that the corrective action has been completed, the ECOs are to sign off on the Corrective Action Report and attach the report to the non-compliance notice in the EMPr file. Corrective action is considered complete once the ECOs have signed off the report.

4.9 Photographic Record

A digital photographic record will be kept. The photographic record will show before, during and post-rehabilitation evidence of the project and in cases of damages claims if they arise. Each image must be dated, and a brief description note must be attached. The Contractor shall allow the ECO to take photographs of all areas, activities, and actions.

The ECOs shall keep an electronic database of photographic records, which will include:

1. Pictures of all areas designated as work areas, camp areas, development sites and storage areas taken before these areas are set up;
2. All bunding and fencing;
3. Road conditions and road verges;
4. Topsoil storage areas;
5. All areas to be cordoned off during construction;
6. Waste management sites;
7. Ablution facilities;
8. Any non-conformances deemed to be “significant”;
9. All completed corrective actions for non-compliance;
10. All required signage;
11. Photographic recordings of incidents;
12. All areas before, during and post-rehabilitation; and
13. Include relevant photographs in the Final Environmental Audit Report.

4.10 Complaints Register

The ECOs shall keep a current and up-to-date complaints register. The complaints register records all complaints from communities, stakeholders, and individuals. The Complaints Record shall:

1. Record the name and contact details of the complainant;
2. Record the time and date of the complaint;
3. Contain a detailed description of the complaint;
4. Where relevant and appropriate, contain photographic evidence of the complaint or damage; and

5. Contain a copy of the ECO written response to each complaint received and record any further correspondence with the complainant. The ECO's written response will include a description of any corrective action to be taken and must be signed by the Contractor, ECO and affected party. Where the complainant issues a damage claim, the ECOs shall respond as described below.

4.11 Claims For Damages

If a Claim for Damages is submitted by a community, landowner or individual, the ECOs shall:

1. Record the full details of the complaint as described above;
2. The DPM will evaluate the claim and associated damage and submit it for approval;
3. Following consideration by the DPM, the claim is to be resolved and settled immediately, or the reason for not accepting the claim is communicated in writing to the claimant. Should the claimant not receive this, the ECO shall, in writing, report the incident to the Developer's negotiator and legal department; and
4. The EMPr file will record a formal record of the ECOs' response to the claimant and the rectification of the payment method, not the amount.

4.12 Interactions with Affected Parties

Open, transparent, and good relations with affected landowners, communities, and regional staff are essential to manage and mitigate environmental impacts successfully. The ECOs shall:

1. Ensure that all queries, complaints and claims are dealt with within an agreed timeframe;
2. Ensure that any or all agreements are documented and signed by all parties and kept in the EMPr file;
3. Ensure that complaints telephone numbers are made available to all landowners and affected parties; and
4. Ensure that contact with affected parties is courteous at all times.

4.13 Work Stoppage

When the ECO believes a construction activity will result in environmental damage, the ECO may issue instructions to the Project Manager, who will order the Contractor to halt the activity. Penalties may be levied for non-compliance. The Contractor will keep written records of instructions from the ECO and Project Manager concerning environmental matters. Only written instructions entered into the site instruction book or written instructions issued via email, fax or hand-delivered and signed off by the Project Manager will be considered valid instructions to the Contractor. The Project Manager should attach or transfer all written instructions initially not included in the site instruction book to avoid later confusion or potential conflict.

4.14 Environmental Audits

Internal environmental audits of the activity and implementation of the EMPr may be undertaken. The findings and outcomes are included in the EMPr file.

The ECO must conduct and prepare monthly audit reports. The report will be tabled as the critical point on the Environmental/Site Meetings agenda. The final report will be circulated to the Project Manager and filed in the EMPr file. The ECO shall submit the monthly reports to the CA at a frequency determined by the EA. At a minimum, the monthly report is to cover the following:

- Environmental Checklists;

- Deviations and non-compliances with the checklists;
- Non-compliances issued;
- Completed and reported corrective actions;
- Environmental Monitoring;
- General environmental findings and actions; and
- Any minutes of the Environmental/Site Meetings.

4.15 Final Environmental Audits

After the rehabilitation and/or EA requirements are met, a final EAR must be prepared and, if required, submitted to the CA. The EAR must comply with Appendix 7 of the EIA Regulations.

5 IMPACT MANAGEMENT OUTCOMES AND ACTIONS

This section sets out the prescribed impact management outcomes and associated impact management actions that have been identified. The developer is responsible for ensuring the implementation of these outcomes and actions to mitigate the impact of such aspects identified for the development.

It is essential that the EMPr requirements be carefully studied, understood, implemented, and adhered to at all times. To simplify the EMPr requirements, each aspect related to the EMPr has been addressed in the table below. The period when a requirement must be implemented supports each action within the EMPr.

Each of these aspects is briefly described below for ease of reference.

- Environmental Measures, Actions and Controls
  This section indicates the actions required to prevent and/or minimise the potential environmental impacts associated with the project.

- Responsibility
  This section indicates the party responsible for implementing the environmental measures and action plans in the EMPr.

- Monitoring Frequency
  This section indicates when the actions for that specific aspect must be implemented and/or monitored.

5.1 PRECONSTRUCTION PHASE

5.1.1 Planning and Site Preparation

Impact management outcome: All preconstruction conditions are met, and approvals are obtained.

Management Actions and Controls	Responsibility	Monitoring Frequency
• An independent ECO must be appointed to monitor the contractor's compliance to the EMPr • All required approvals obtained. • This EMPr must be made binding to the Contractor, as well as sub-contractors by including it in the tender documentation. • Draw up and submit for approval an Environmental Site Management and Rehabilitation Plan, • The service systems are to be designed according to the minimum requirements of and submitted to the Local authority for approval. • Designs of foundations for individual structures must be confirmed by a qualified geologist. • Pre-construction tests for baseline readings on water quality, dust, and noise must be undertaken and reports prepared. • The environmental assessment, site walkthrough, and any additional areas identified during development will inform the identification of access-restricted areas. • Erect, demarcate and maintain barriers with clear signage around the perimeter of any access-restricted area. Colour, and coding could be used if appropriate; • Access to the site via existing roads only; no indiscriminate driving through freshwater ecosystems. • All private roads used for access must be maintained and left in at least the original condition upon completion of the works. All contractors must be made aware of all these access routes. • Maximum use of existing servitudes and roads must be made to minimise further disturbance by developing new roads. • In circumstances where private roads must be used, the condition of the said roads must be recorded before use and the condition thereof agreed by the DPM, and the contractor.	Developer/contractor	Before construction

5.1.2 Site Establishment

Impact management outcome: Impacts on the environment are minimised during site establishment, and the development footprint is kept to a demarcated development area.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• The contractor must provide a method statement before any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of critical infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management. • The location of camps must be within the approved area to ensure that the site does not impact sensitive areas identified in the environmental assessment or site walk-through. • Sites must be located where possible in previously disturbed areas. • Before any construction activity on site and the arrival of construction machinery, implement and demarcate 15 m ecological buffer and 5 m RoW. • Mark buffer and RoW as 'no-go' zones; restrict entry to authorised personnel. • Demarcate areas outside 5 m RoW as no-go zones. • Complete the search, rescue, and replanting of all protected and endangered species likely to be damaged during project development before any development or clearing. • Permits for removal must be obtained from the relevant CA before the cutting or clearing of the affected species and must be filed. • The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the replanting location complies with the conditions of approvals	Contractor	**Once off**

5.1.3 Fencing		
Impact management outcome: Minimise environmental impact and ensure safe and controlled access to the site by erecting fencing and gates where required.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• The site must be demarcated, gate installed; and with restricted access, where possible. • The main access points on the project site must be clearly signposted and delivery areas must be communicated to all suppliers and sub-contractors. • Laydown areas, refuelling zones, and storage facilities must remain outside buffers and preferably the 32 m NEMA ZoR. • ECO approval required before use. • Movement of all vehicles to remain on designated routes. The vehicles shall not exceed a speed of 40 km/h on gravel or earth roads on site. • All demarcation fencing and barriers must be maintained in good working order during the development activities. • Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where applicable. • Fenced areas with gate access must remain locked after hours, on weekends, and on holidays if staff is away from the site. Site security will always be required. • On completion of the development phase, all temporary fences are to be removed; • The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely.	Contractor Developer	Ongoing

5.2 CONSTRUCTION PHASE

5.2.1 Environmental Awareness Training

Impact management outcome: All onsite staff know and understand their individual responsibilities under this EMPr.

Management Actions and Controls	Responsibility	Monitoring Frequency
• All staff must receive environmental awareness training before the commencement. • The Contractor must allow for sufficient sessions to train all personnel, with no more than 20 personnel attending each course. • Train personnel on restricted movement in freshwater ecosystems. • Refresher environmental awareness training is available as and when required. • All staff are aware of the conditions and controls linked to the EA and within the EMPr and are made aware of their roles and responsibilities in achieving compliance with the EA and EMPr. • The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum: - Safety notifications; and • No littering. Environmental awareness training must include, as a minimum, the following: a) Description of significant environmental impacts, actual or potential, related to their work; b) Mitigation measures to be implemented when carrying out specific activities; c) Emergency preparedness and response procedures; d) Emergency procedures; e) Procedures to be followed when working near or within sensitive areas; f) Wastewater management procedures; g) Water usage and conservation; h) Solid waste management procedures; i) Sanitation procedures; j) Fire prevention; and k) Disease prevention. • A record of all environmental awareness training courses undertaken must be available. • Educate workers on the dangers of open and/or unattended fires. • An attendance register of staff who received environmental awareness training must be available. • Course material must be available and presented in appropriate languages that all staff understands.	Proponent/developer	This is to be undertaken before the start of the construction phase. Once- off

5.2.2 Vegetation Clearing

Impact management outcome: Vegetation clearing is restricted to the authorised development footprint.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Clearing must be limited to authorised footprint. • Indigenous vegetation that does not interfere with development must be left undisturbed. • Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species: • Rivers and watercourses must be clear of fallen trees, vegetation cuttings and debris. • Only a registered pest control operator may apply herbicides on a commercial basis, and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or appropriately trained. • A daily register of all relevant details of herbicide usage must be kept. • No herbicides must be used in estuaries. • All protected species and sensitive vegetation not removed must be marked and such areas fenced off where possible. • Alien invasive vegetation must be removed and disposed of at a licensed waste management facility.	Contractor ECO Developer	Duration of site clearing

5.2.3 Topsoil Conservation

Impact management outcome: Proper management of topsoil for use during rehabilitation		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• The top layer of all areas to be excavated shall be stripped and stockpiled in areas where this material will not be damaged, removed or compacted. When the stripping of topsoil takes place, the grass component shall be included in the stripped topsoil • Topsoil layer to be stockpiled separately from overburden. Stockpiling will only be done in designated places where it will not interfere with the natural drainage paths of the environment • No stockpiling shall be allowed below the 1:100 year flood line/within the transitional zones • Co-ordinate Works to limit unnecessarily prolonged exposure of stripped areas and stockpiles. Retain vegetation and soil in position for as long as possible, removing it immediately before construction. • Strip and stockpile herbaceous vegetation, overlying grass and other organic matter, and topsoil. • Do not strip topsoil when it is wet. • Stockpile topsoil from different sites separately. • Do not mix topsoil obtained from different sites. • Reuse topsoil for rehabilitation.	Contractor	As per the construction schedule

5.2.4 Water Supply Management

Impact management outcome: Undertake responsible water usage		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**

• Diversions must not alter upstream/downstream water levels significantly.
• The Contractor must ensure the following:
  - No damage occurs to the riverbed or banks from stream diversion activities; and
  - All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented.
• Ensure water conservation is being practised by:
  - Minimising water use during cleaning of equipment;
  - Undertaking regular audits of water systems; and
  - This includes discussing water usage and conservation during environmental awareness training.
  - The use of grey water is encouraged.
	Contractor	Ongoing

5.2.5 Storm and Wastewater Management

Impact management outcome: Impacts on the environment caused by stormwater and wastewater discharges during construction are avoided.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Runoff from the cement/concrete batching areas must be controlled. Contaminated water must be collected, stored and either treated or disposed of off-site. • All oil spillage must be controlled using an approved absorbent material, and the used absorbent material must be disposed of at an appropriate waste disposal facility. • Natural stormwater runoff is not contaminated, and clean water can be discharged directly into watercourses and water bodies, subject to the Project Manager's approval and support by the ECO. • Water contaminated with suspended solids, may be released into watercourses or water bodies only once all suspended solids have been removed by settling out these solids in settlement ponds. • Build a bund around the waste storage area to stop overflow into stormwater. • Drainage channels to be constructed every 50m along access road to divert runoff during construction. • Natural stormwater must flow freely, either as sheet flow or in open grass swales • Energy dissipaters must be installed at all potential large flow volume areas.	Contractor ECO/ESO	Ongoing

5.2.6 Solid and Hazardous Waste Management

Impact management outcome: Wastes are appropriately stored, handled, and safely disposed of at a recognised waste facility.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• All measures regarding waste management must be undertaken using an integrated waste management approach. • Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided. • A suitably positioned and demarcated waste collection site must be identified, maintained clean and orderly. • Staff must be trained on waste segregation with marked bins for each waste type . • Waste produced must be disposed of accordingly, separately, regularly, at registered general waste disposal sites/recycling companies, registered hazardous disposal sites, with waste vegetation residues and AIPs at licensed facilities. • Certificates of safe disposal for general, hazardous, and recycled waste must be maintained. • No burning or burying of waste is permitted. • Cement bags disposed via hazardous waste stream. • Excess concrete disposed at licensed landfill with chain of custody.	Contractor SHE	Ongoing/Daily

5.2.7 Protection of Wetlands and Watercourses

Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• The demarcations will be maintained during the construction period, and no workers, construction machinery, or construction material should be moved or put outside the demarcated construction site. • The construction area must accommodate all construction-related activities, including materials storage, access routes, soil stockpile etc. • The movement of all machinery, workers and plants will be restricted within the alignment of the infrastructure. • The materials will only be stacked in appropriate locations. • Bedding materials will be sourced from approved sources. • Unsuitable or excess material will be disposed of in an approved disposal area. • All watercourses will be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, wash and contaminated water or organic material resulting from the	Contractor	Daily

Contractor's activities; • If a spill occurs, prompt action must be taken to clear the polluted or affected areas. • Where possible, no development equipment must traverse any seasonal or permanent wetland. There must not be any impact on the long-term morphological dynamics of water courses. • When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken: - Water levels during the period of construction. - No altering of the bed, banks, course, or characteristics of a watercourse - During the works' execution, appropriate measures must be implemented to prevent pollution and contamination of the riparian environment, e.g., ensuring that construction equipment is well maintained. - Where earthwork is being undertaken near any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel and - Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. • In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows.		

5.2.8 Protection of Fauna and Flora

Impact management outcome: Disturbance to fauna is minimised.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• No poaching must be tolerated under any circumstances. All animal dens near the work areas must be marked as access-restricted areas. • No deliberate killing of fauna is allowed. • No Threatened or Protected Species (ToPs) and/or protected fauna as listed in NEMBA (Act No. 10 of 2004) and provincial ordinances may be removed and/or relocated without appropriate authorisations/permits. • No unauthorised access, land clearing, construction activities, vehicular traffic of any kind, pedestrian traffic or fires will be permitted external to specific construction areas or in sensitive areas • No clearing of vegetation will be allowed within any wetland areas other than as indicated by the ECO • All invader or exotic plant species must be removed and disposed of at a landfill site • Wood harvesting of any trees or shrubs inside the protected area or adjacent areas for firewood shall be prohibited and subject to a fine • Floral assets and tree clumps shall be identified and retained where possible • No trees planted by the municipality may be removed without prior approval by the relevant department. • No indigenous trees or floral assets may be removed without permission from the specialist, or in some cases, a flora removal permit may be required • No trees, hedges or other large vegetation types may be planted along or over service pipelines/areas • Herbicide use must avoid impacts on indigenous vegetation and water contamination.	Contractor ECO,	Ongoing

5.2.9 Protection of Heritage /Resources

Impact management outcome: Impact on heritage resources is minimised.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Identify, demarcate, and prevent impact to all known sensitive heritage features on-site • Monitor excavations for potential fossils, artefacts, and materials of heritage importance. • All work must cease immediately if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/palaeontologist (or the South African Police Services) so that a systematic and professional6v investigation can be undertaken. Sufficient time must be allowed to remove/collect such material before development recommences.66j	Contractor ECO	Monitored daily and ongoing

5.2.10 Safety

Impact management outcome: All precautions are taken to minimise the risk of injury, harm, or complaints.		
Management Actions and Controls6	**Responsibility**	**Monitoring Frequency**
• The site and crew are to be managed strictly per the Occupational Health and Safety Act (85 of 1993) and the National Building Regulations. • No informal settlement allowed on site or in the adjacent roads leading to the construction site. • The contractor shall manage any informal traders on or adjacent to the site. • All dangerous areas and deep excavations should be barrier taped. • The handling of equipment and materials to be supervised. • Clear sign boards should be erected at the site entrance. • Fire extinguishers should be accessible, and personnel trained on their use. • A list with all the relevant emergency telephone numbers shall be pasted up in the site office. • Identify fire hazards, demarcate and restrict public access to these areas, and notify the local authority of potential threats, such as large brush stockpiles and fuels. • Adequate protective measures must be implemented to prevent unauthorised access to site and scaffolding. • Ensure structures vulnerable to high winds are secured. • Maintain an incidents and complaints register in which all incidents or complaints involving the public are	Contractor SHE	During construction

5.2.11 Security

Impact management outcome: All precautions are taken to minimise the risk of theft, loss of equipment and uncontrolled access		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Security officers will remain on site to guard the equipment. • Access control must consistently be enforced. • Fencing is required to demarcate the construction site and work camp boundaries. • No casual access to the work camp and the construction site will be allowed • Effects of erecting temporary fences must be rehabilitated after construction is complete. • Ensure structures vulnerable to high winds are secured. • Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.	Contractor SHE	During construction

5.2.12 Sanitation

Impact management outcome: Clean and well-maintained toilet facilities available to all staff to minimise the risk of disease and environmental impact.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Mobile chemical toilets are installed onsite if no other ablution facilities are available. • The ablution facilities and or mobile toilets must be consistently used, and no indiscriminate use of the veld for ablutions must be permitted under any circumstances. • Where mobile chemical toilets are required, the following must be ensured: - Toilets are no closer than 100m to any watercourse or body. - Toilets are secured to the ground to prevent them from toppling due to wind - No spillage occurs when the toilets are cleaned or emptied, and the contents are managed per the EMPr. - Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out. - Toilets are emptied before long weekends and workers' holidays and must be locked after working hours. - Toilets are serviced regularly, and the ECO must inspect toilets to ensure compliance with health standards.	Contractor	Monthly, throughout the construction phase

5.2.13 Hazardous Substances

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• The use and storage of hazardous substances are minimised, and non-hazardous and non-toxic alternatives are substituted where possible. • All hazardous substances must be stored in suitable containers as defined in the Method Statement. • Containers must be marked to indicate contents, quantities, and safety requirements. • All storage areas must be bunded. The bunded area must be sufficient to contain a spill/leak from the stored containers. • Bunded areas to be suitably lined with a SABS-approved liner. • An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and updated continuously. • All hazardous chemicals used on site must have Material Safety Data Sheets (MSDS). • All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet. • Employees handling hazardous substances/materials must know the potential impacts and follow appropriate safety measures. Proper personal protective equipment must be made available. • The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid are stored in appropriate storage tanks or browsers. • The tanks/bowsers must be on a smooth, impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund, and the volume inside the bund must be 130% of the total capacity of all the storage tanks/bowsers (110% statutory requirement plus an allowance for rainfall). The bund floor must be sloped, draining to an oil separator. • Provision must be made for refueling at the storage area by protecting the soil with impermeable ground cover. Where dispensing equipment is used, a drip tray must contain spills. • All empty, externally dirty drums must be stored on a drip tray or within a bunded area. • No unauthorised access into the hazardous substance's storage areas must be permitted. • No smoking must be allowed near the hazardous storage areas. • Adequate fire-fighting equipment must be made available at all hazardous storage areas. • Where refueling away from the dedicated refueling station is required, a mobile refueling unit must be used. Appropriate ground protection, such as drip trays, must be used.	Contractor	Monitored daily and ongoing

• An appropriately sized spill kit kept onsite relevant to the scale of the activity involving the use of hazardous substances must always be available. • The responsible operator must have the required training to use the spill kit in emergencies. • An appropriate number of spill kits must be available in all areas where activities are undertaken. • In the event of a spill, contaminated soil must be collected in containers stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008.		

5.2.14 Workshop, Equipment Maintenance and Storage

Impact management outcome: Soil, surface water and groundwater contamination are minimised.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Where possible and practical, vehicle and equipment maintenance must occur in the workshop or specifically prepared area. • During servicing vehicles or equipment, mainly where emergency repairs are affected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must know about a fire as soon as it starts. • Leaking equipment must be repaired immediately or be removed from the site to facilitate repair. • Workshop areas must be monitored for oil and fuel spills. • Appropriately sized spill kit kept onsite relevant to the activity's scale must be available. • The workshop area must have a bunded concrete slab sloped to facilitate runoff into a collection sump or suitable oil/water separator where maintenance work on vehicles and equipment can be performed. • Water drainage from the workshop must be contained and managed.	Contractor	Ongoing

5.2.15 Batching Plants

Impact management outcome: Minimise spillages and contamination of soil, surface water and groundwater.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Concrete mixing must be carried out on an impermeable surface. • Batching plant areas must have a containment facility to collect cement-laden water. • Dirty water from the batching plant must be contained to prevent soil and groundwater contamination. • Bagged cement must be stored in an appropriate facility and at least 10m from water courses. • A washout facility must be provided for the washing of concrete-associated equipment. Water used for washing must be restricted. • Hardened concrete from the washout facility or concrete mixer can be reused or disposed of at an appropriate licensed disposal facility. • Empty cement bags must be secured if these are temporarily stored on site. • Sand and cement aggregates must be kept damp to prevent dust generation. • Any excess sand, stone and cement must be removed or reused from the site on completion of the construction period and disposed of at a registered disposal facility. • Temporary fencing and containment walls must be erected around batching plants.	Contractor	Monitored daily and ongoing

5.2.16 Dust Emissions

Impact management outcome: Dust prevention measures are applied to minimise dust generation.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Measures implemented to minimise dust generation due to project development activities. • Removal of vegetation must be avoided until soil stripping is required, and similarly exposed surfaces must be re-vegetated or stabilised as soon as possible. • Excavation, handling, and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present. • During high wind conditions, the ECO must evaluate the situation and recommend whether dust-damping measures are adequate or whether working will cease until the wind speed drops to an acceptable level. • Where possible, soil stockpiles must be in sheltered areas where they are not exposed to the erosive effects of the wind. • Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO. • Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas. • Straw stabilisation must be applied at one bale/10m² and harrowed into the top 100 mm of top material for all completed earthworks. • For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.	Contractor	Daily

5.2.17 Blasting

Impact management outcome: Impact on the environment is minimised through a safe blasting practice		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• A suitably licensed blasting contractor must conduct any blasting activity. • Where required, approval must be obtained from authorities in advance, and • Notify surrounding landowners and emergency services site personnel of blasting activity 24 hours before such activity takes place on Site.	Contractor	Ongoing

5.2.18 Noise

Impact Management Outcome: Prevent excessive noise by implementing mitigation measures		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• The Contractor must keep the noise level within acceptable limits. Restrict the use of sound amplification equipment for communication and emergency only. • All vehicles and machinery must be fitted with appropriate silencing technology and maintained. • The contractor must record and communicate any complaints it receives regarding noise. Where possible or applicable, transport construction workers to and from the site daily. • Develop a Code of Conduct regarding the behaviour of construction staff. • Operating hours are adhered to as determined by the environmental authorisation. Where not defined, ensure that activities meet the impact management outcome related to noise management.	Contractor	Daily

5.2.19 Stockpiling and Stockpile Areas

Impact management outcome: Erosion and sedimentation because of stockpiling are reduced.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• All excavated material must be stored appropriately on-site to minimise impacts to water bodies. • All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth • Topsoil stockpiles must be outside buffers and ZoR; not exceed 2 m in height. • During windy and heavy rain periods, stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin). • Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material to prevent erosion.	Developer Contractor	Ongoing

5.2.20 Erosion Control

Impact management outcome: Minimise erosion due to surface water and leading to loss of soil and sedimentation of wetlands		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Construct sediment control devices in-situ before works. • Install sediment traps every 15 m downstream or at downgradient boundaries. • Inspect traps daily; remove sediment weekly. • ECO discretion applies to placement. • Avoid over-wetting, saturation and unnecessary runoff during dust control activities and irrigation. • Do not drain, fill or alter in any way any wetland or drainage line, including the riverbanks, unless this forms part of the construction Works, or upon specific instruction by the EO / ECO.	Developer Contractor	Ongoing

• Do not allow surface water or stormwater to be concentrated, flow down, cut or fill slopes or along pipeline routes without erosion protection measures. • Line overflow and scour channels with stone pitching along their length and at their discharge points to prevent soil erosion. • Ensure that channels do not discharge straight down the contours. These must be aligned at such an angle to the contours that they have the least possible gradient. • Ensure that overland discharge occurs over areas with a minimum cover of 90% grass cover at a minimum height of 150mm. This applies to areas downslope of the discharge point as well. • Where possible, undertake river diversions outside of the rainy season. • Protect all areas susceptible to erosion and ensure no undue soil erosion from activities within and adjacent to the construction camp and Work Areas. • Retain natural trees, shrubbery and grass species wherever possible. • Vehicles not to access natural areas beyond the demarcated boundary of the Work Area. Utilise only light equipment for access and deliveries into areas of unstable soils, in areas where erosion is evident. • Institute adequate sedimentation control measures at river crossings and when excavation or disturbance within riverbanks, or the riverbed takes place. • Address erosion donga crossings as river crossings, applying soil erosion control and bank stabilisation procedures as specified by the EO/ECO. • Do not allow erosion to develop on a large scale before effecting repairs. When in doubt, seek advice from the EO/ECO. • Repair all erosion damage as soon as possible. • In general, steep slopes or slopes where the soils are by nature dispersive or sandy, must be stabilised.		

5.2.21 Civil Works

Impact management outcome: Impact on the environment minimised during civil works.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Limit footprint to authorised repairs and 5 m RoW. • Restrict equipment in riparian ecosystems. • Concrete mixing only in lined/bunded mixers at camp; ready-mix preferred. • Cement piped into footprint; manual application via trays. • Washout areas outside riparian ecosystems; treat/discharge wash water properly. • No rinsing of cement trucks/trays on site. • Where terracing is required, topsoil must be collected and retained for reuse to rehabilitate disturbed areas not covered by yard stone. • Areas to be rehabilitated include terrace embankments and areas outside the high-voltage yards. • All sloped areas must be stabilised to ensure proper rehabilitation is affected and erosion is controlled. • These areas can be stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented. • Rehabilitation of the disturbed areas must be managed under Landscaping and Rehabilitation. • All excess spoil generated must be disposed of appropriately and at a recognised landfill site and • Spoil can, however, be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes.	Developer Contractor	Ongoing

5.2.22 Excavations and Trenching and Drainage Systems

Impact management outcome: No environmental degradation occurs due to excavation or installation of foundations.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Temporary crossings must intersect rivers at right angles. • Divert water downstream around construction areas; recharge downstream reaches. • Install sediment traps around upgradient activities. • All excess spoil generated during foundation excavation must be disposed of appropriately and at a recognised disposal site if not used for backfilling purposes. • Spoil can, however, be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes. • Management of equipment for excavation purposes must be undertaken and • Hazardous substance spills from equipment must be managed	Developer Contractor	Ongoing

5.2.23 Services

Impact management outcome: No environmental degradation occurs due to excavation or installation of foundations.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• If any disruption in services is foreseen, adjacent landowners must be informed at least four days prior • Pipelines must be routinely inspected for leaks. • Any detected leaks must be repaired immediately to prevent alteration of water volumes. • ECO to verify repairs and record incidents in compliance reports.	Developer Contractor	Ongoing

5.2.24 Community Relations

Impact management outcome: Cordial and beneficial relations are maintained with community.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Develop and implement communication strategies to facilitate public participation. • Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process. • Sustain continuous communication and liaison with neighbouring owners and residents • Create work and training opportunities for local stakeholders; and • Where feasible, no workers, except security personnel, must be permitted to stay overnight on the site.	Developer ECO	Ongoingd

5.2.25 Temporary Closure of Site

Impact management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Bunds must be emptied (where applicable) and undertaken following the impact management actions • Hazardous storage areas must be well-ventilated. • Fire extinguishers must be serviced and accessible. Service records are to be filed and audited. • Emergency and contact • Night hazards such as reflectors, lighting, traffic signage, etc., must have been checked. • Structures vulnerable to high winds must be secured. • Wind and dust mitigation must be implemented. • Cement and materials stores must have been secured. • Toilets must have been emptied and secured. • Refuse bins must have been emptied and secured. • Drip trays must have been emptied and secured.	Contractor	Ongoing

5.2.26 Fire Prevention

Impact management outcome: Prevention of the risk of uncontrollable fires		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Designate smoking areas where the fire hazard could be regarded as insignificant. • Firefighting equipment must be available on all vehicles located on site. • The local Fire Protection Agency (FPA) must be informed of construction activities. • Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site.	Contractor	Ongoing

5.2.27 Emergency Procedures

Impact management outcome: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Compile an Emergency Response Action Plan (ERAP) before the commencement of the project. • The Emergency Plan must deal with accidents, potential spillages and fires on site. • All staff must be aware of emergency procedures as part of environmental awareness training. • Freshwater specialist and ECO must monitor diversions and sediment traps bi-monthly. • Monitoring continues after flows are redirected. • The relevant local authority must know about a fire as soon as it starts. • In an emergency, mitigation measures must be implemented to contain the spill or leak.	Contractor	Monitored daily and ongoing

5.3 REHABILITATION AND LANDSCAPING PHASE

5.3.1 Removal and Disposal of Waste or Safety of Material

Impact management outcome: Cleaning the site to ensure no construction remnants are a nuisance.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Entry into no-go areas only for essential rehabilitation. • Remove from site all construction plant, equipment, storage containers, temporary fencing, temporary services, fixtures and any other temporary Works. • Clear the site of all inert waste and rubble, including surplus rock, foundations, and batching plant aggregates. • Remove temporary fuel stores, hazardous substance stores, and pollution control sumps from the site. Dispose of hazardous waste in the approved manner. • Herbicide use must avoid contamination and indigenous plant loss. • Remove all pollution containment structures and materials not used again as hazardous waste. • Dismantle and flatten temporary drifts and river crossings, reinstating all drainage lines to approximate their original profile. • Remove temporary sanitary infrastructure and wastewater disposal systems	Contractor	Once-off after construction

5.3.2 Shaping and Backfilling

Impact management outcome: To ensure that the site is safe and that topsoil is used for revegetation		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Backfill all excavations and test pits with in situ material. Make safe all dangerous excavations by backfilling. • No slopes steeper than 1(V):3(H) are permitted unless specified by the engineer. • Backfill drains, and evaporation dams and compact, covering with a final layer of topsoil to a height of 100mm above the surrounding ground surface. • Monitor backfilled areas for subsidence and fill depressions using available material. • Shape all disturbed areas to blend in with the surrounding landscape. • Replace and redistribute stockpiled topsoil with herbaceous vegetation, overlying grass, and other fine organic matter in all disturbed areas of the construction site. • Place topsoil in the same area from where it was stripped. • Spread remaining soil thinly in riparian zone to aid reclamation. • Do not use topsoil suspected to be contaminated with the seed of alien vegetation. • Shape and mound topsoil to 200m from the top of manholes and valve chambers which protrude above ground and over pipelines to facilitate subsequent consolidation of the backfill.	Contractor	Weekly during rehabilitation phase

5.3.3 Revegetation and Landscaping

Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Rehabilitation/landscaping is to be done immediately after the completion of the works. • Rehabilitate impacted reaches and buffers; clear AIPs and reinstate indigenous vegetation. • Rip and/or scarify all areas following the application of topsoil to facilitate the mixing of the uppermost layers. • Rip and/or scarify all disturbed areas of the construction site, including temporary access routes and roads, compacted during the execution of the Works. • Stored topsoil and reseeding must be used to rehabilitate all open soil areas following construction activities • Re-vegetation must match the vegetation type which previously existed Grassing must be done by a qualified contractor using appropriate equipment. • Seeding should be done during the summer when the germination rate improves. • Hydroseeding with a winter mix is only specified when regrassing is urgent. • The use of indigenous vegetation should be optimized during the landscaping • Develop and implement alien invasive management plan post-construction.	Contractor	Weekly during rehabilitation phase

5.4 OPERATIONAL PHASE

5.4.1 Road Maintenance and Drainage

Impact management outcome: Preserve water quality, flow concentration and erosion		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Routine road maintenance to prevent erosion; prioritise after rainfall events. • O&M Manager to monitor stormwater runoff; ensure diffuse spread via vegetation/rocks. • Maintenance vehicles restricted to dedicated access roads. • Should erosion be noted that was caused by the bridge construction, it should be monitored at tie-in points; and gullies rehabilitated with indigenous vegetation and rocks.	Operation & Maintenance Manager	Continuous

5.4.2 Culvert and Concrete Works

Impact management outcome: To ensure that there are no negative effects on water movement post construction		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Apply control measures given for culvert/concrete works. • Movement restrictions per recommendations. • Install sediment traps downstream of maintenance works. • Vegetation clearing by hand only; no machinery in freshwater ecosystems.	Operation & Maintenance Manager	Continuous

5.4.3 Alien Invasive Plant (AIP) Management

Impact management outcome: Protect areas disturbed during development phase from loss of indigenous vegetation and proliferation of alien species .		
Management Actions and Controls	**Responsibility**	**Monitoring Frequency**
• Apply the developed management plan for AIPs. • Manage AIPs post-construction until basal cover achieved. • Remove AIPs during dry months to limit contamination. • Loosen and revegetate soil after AIP removal. • Annual follow-up for at least 3 years post-construction.	Operation & Maintenance Manager	Continuous

6 CONCLUSION

Although this document contains all foreseeable and potential mitigations or management actions, the EMPr should be seen as a live day-to-day management document. If continuously reviewed and managed correctly, the EMPr will result in the successful construction and operation of the proposed development.

All attempts should be made to include this EMPr in any contractual documentation so that the contractors know the requirements and timing implications needed to fulfil its provisions.

Further guidance should also be taken on any conditions in the Environmental Authorisation if the project is approved and the conditions are an integral part of the final EMPr.

7 ADDENDUM