

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE VLAKFONTEIN SOLAR PV FACILITY, FREE STATE PROVINCE

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ACRONYMS AND ABBREVIATIONS

Acronym / Abbreviation	Definition
BA	Basic Assessment
BAR	Basic Assessment Report
BBBEE	Broad-Based Black Economic Empowerment
B.Sc.	Bachelor of Science
CA	Competent Authority
CARA	Conservation of Agricultural Resources Act, 1983 (No. 43 of 1983)
CBA	Critical Biodiversity Area
CBD	Central Business District
COD	Chemical Oxygen Demand
CR	Critically Endangered
DFFE	Department of Forestry, Fisheries and Environment (formerly Department of Environmental Affairs (DEA))
DWS	Department of Water and Sanitation (formerly Department of Water Affairs (DWA))
DM	District Municipality
DMRE	Department of Mineral Resources and Energy (formerly Department of Mineral Resources (DMR))
EA	Environmental Authorisation, i.t.o. NEMA
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
EC	Electrical Conductivity
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIA Regulations, 2014	Environmental Impact Assessment Regulations, 2014 (GN R 982 of 2014, as amended by GN R 326 of 2017)
EIAR	Environmental Impact Assessment Report
EIS	Ecological Importance and Sensitivity
EMPr	Environmental Management Programme
En	Endangered
ESA	Ecological Support Areas
FEPA	Freshwater Ecosystem Priority Area
GA	General Authorisation
GDP	Gross Domestic Product

Acronym / Abbreviation	Definition
GHG	Greenhouse Gas
GN	Government Notice
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
IFC	International Finance Corporation
IRP	Integrated Resource Plan
ISO	International Standards Organization
IUCN	International Union for Conservation of Nature
LC	Least Concern
LN	Listing Notice
LN 1, 2014	Environmental Impact Assessment Regulations Listing Notice 1, 2014 (GN R 983 of 2014, as amended by GN R 327 of 2017)
LN 2, 2014	Environmental Impact Assessment Regulations Listing Notice 2, 2014 (GN R 984 of 2014, as amended by GN R 325 of 2017)
LN 3, 2014	Environmental Impact Assessment Regulations Listing Notice 3, 2014 (GN R 985 of 2014, as amended by GN R 324 of 2017)
LoS	Level-of-Service
mamsl	Metres Above Mean Sea Level
MAP	Mean Annual Precipitation
MAR	Mean Annual Runoff
MEC	Member of the Executive Council
M.Sc.	Master of Science
NAAQS	National Ambient Air Quality Standard
NAEIS	National Atmospheric Emission Inventory System
NDCR	National Dust Control Regulations, 2013
NDP	National Development Plan
NEMA	National Environmental Management Act, 1998 (No. 107 of 1998)
NEM: AQA	National Environmental Management: Air Quality Act, 2004 (No. 57 of 2003)
NEM:BA	National Environmental Management: Biodiversity Act, 2004 (No. 10 of 2004)
NEM: PAA	National Environmental Management: Protected Areas Act, 2003 (No. 57 of 2003)
NEM: WA	National Environmental Management: Waste Act, 2008 (No. 59 of 2008)
NFEPA	National Freshwater Ecosystem Priority Areas, 2011
NHRA	National Heritage Resources Act, 1999 (No. 25 of 1999)

Acronym / Abbreviation	Definition
NPAES	National Protected Areas Expansion Strategy
NT	Near Threatened
NWA	National Water Act, 1998 (No. 36 of 1989)
PES	Present Ecological State
PM	Particulate Matter
Pr.Sci.Nat.	Registered Professional Natural Scientists
R	Regulation
RE	Remaining Extent
SAAQIS	South African Air Quality Information System
SAELIP	South African Atmospheric Emission Licensing and Inventory Portal
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resource Information System
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SAWS	South African Weather Services
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SHE	Safety, Health and Environment
SIA	Social Impact Assessment
SLR	SLR Consulting (South Africa) (Pty) Ltd
SPLUMA	Spatial Planning and Land Use Management Act, 2013 (No. 16 of 2013)
S&EIA	Scoping and Environmental Impact Assessment
TIA	Traffic Impact Assessment
VAT	Value Added Tax
VIA	Visual Impact Assessment
Vu	Vulnerable
WHO	World Health Organization
WML	Waste Management Licence, i.t.o. NEM: WA
WUL	Water Use Licence, i.t.o. NWA
WULA	Water Use Licence Application

1. INTRODUCTION

1.1 PROJECT BACKGROUND

South Africa Mainstream Renewable Power Developments (Pty) Ltd (Mainstream) is proposing to develop, construct and operate four Solar Photovoltaic (PV) facilities, including Battery Energy Storage Systems (BESS) and associated infrastructure on a site located 19 km west of the town Sasolburg in the Free State Province (see Figure 1-1). The four projects are collectively referred to as the **Safell Cluster**. The total generation capacity of the proposed four solar PV facilities would be up to 550 MW_{ac}. The details of the four PV facilities, independent Power Producer (IPP) Substation, BESS and associated infrastructure is summarised in Table 1-1 below. The location of the four PV facilities are illustrated in Figure 1-1.

The proposed project requires Environmental Authorisation in terms of the National Environmental Management Act, 1998 (No. 107 of 1998) (NEMA), as amended. SLR Consulting (South Africa) (Pty) Ltd (hereafter referred to as “SLR”), have been appointed as the independent environmental consultants to undertake the EIA for the proposed Safell Cluster Project. This Construction Environmental Management Programme (EMPr) has been compiled as part of the Scoping and Environmental Impact Assessment (hereafter collectively referred to as “EIA”) process in compliance with Appendix 4 of the EIA Regulations 2014 (as amended). Thus, this EMPr is compiled for the **Vlakfontein Solar PV Facility**.

Figure 1-2 presents the location of the Vlakfontein Solar PV Facility in relation to the other projects associated with the Safell Cluster.

Table 1-1: Details for each of the projects included in the Safell Cluster

Applicant	Project Name	Capacity (MW)	Affected Property
South Africa Mainstream Renewable Power Developments (Pty) Ltd	Damlaagte Solar PV Facility	150 MW _{ac}	Remaining Extent of the Farm Damlaagte 229
	Safell Solar PV Facility	150 MW _{ac}	Portion 3 of the Farm Willow Grange 246
	Vlakfontein Solar PV Facility	150 MW_{ac}	Portion 6 of the Farm Vlakfontein 161
	Ilikwa Solar PV Facility	100 MW _{ac}	Portion 5 of the Farm Proceederfontein 100

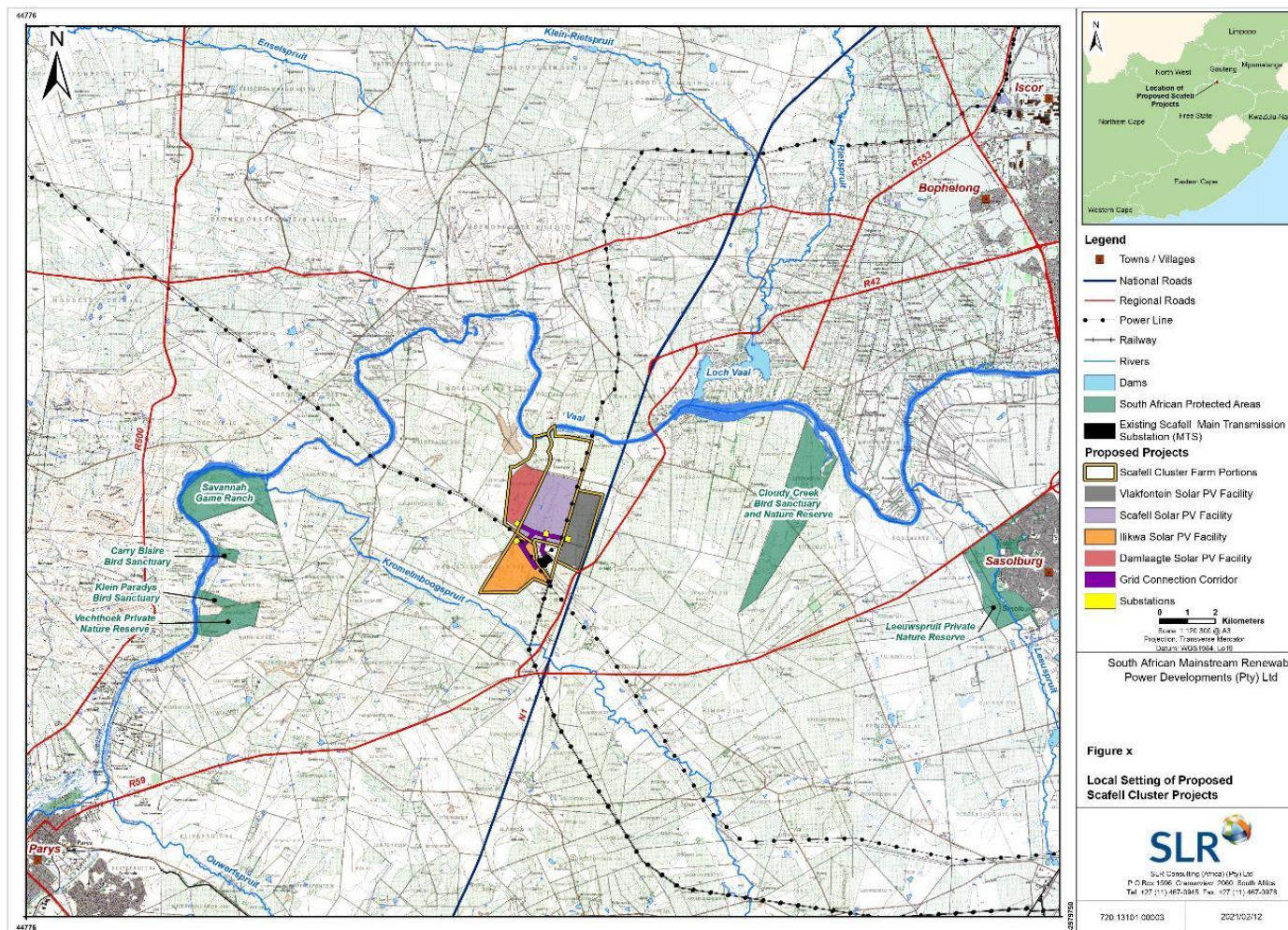


Figure 1-1: Locality Map of the project site for the Scafell Cluster Project

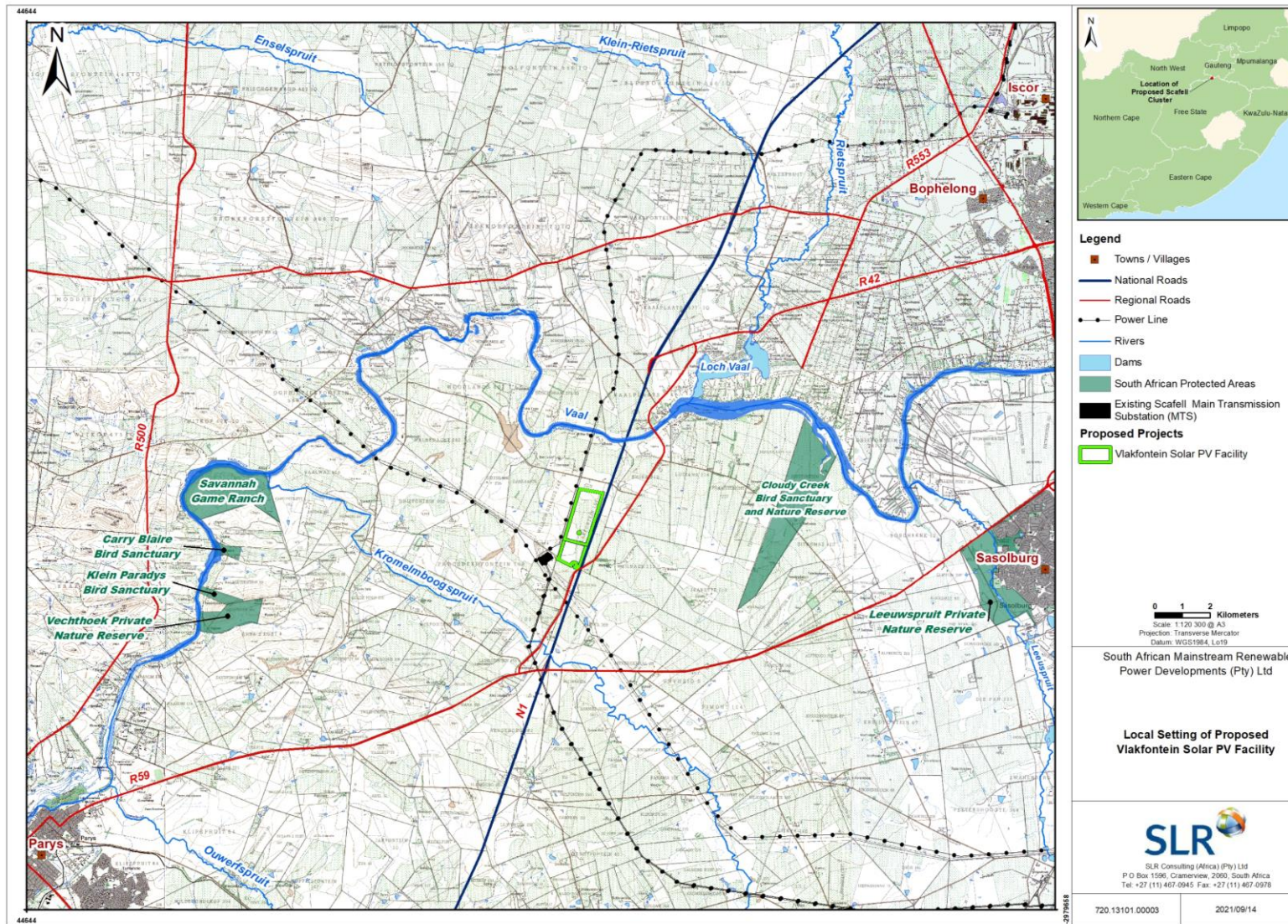


Figure 1-2: Locality Map showing boundaries of the project site for the Vlakfontein Solar PV Facility

1.2 GENERAL PROJECT INFORMATION

1.2.1 Applicant Details

Component	Description
Company Name	South Africa Mainstream Renewable Power Developments (Pty) Ltd
Address:	4 th Floor Mariendahl House Newlands on Main Corners Main & Campground Roads Claremont 7800
Responsible person:	Eugene Marais
Tel:	021 657 4045
Fax:	073 871 5781
E-mail:	eugene.marais@mainstreamrp.com

1.2.2 Site-specific Details

Table 1-2 includes a summary of the site-specific and technical information for the Vlakfontein Solar PV Facility, and Figure 1-3 presents the indicative layout for the proposed project, and Figure 1-4 illustrates the development footprint of the proposed project with the superimposed environmental sensitivities.

Table 1-2: Site-specific and Technical information of the Vlakfontein Solar PV Facility

Component	Vlakfontein Solar PV Facility
Property Information	
Farm name & portion number:	Vlakfontein 161, Portion 6
Surveyor General 21-digit code:	F02500000000016100006
Name of Landowner:	Van Aswegens Boerdery Maatskappy (Pty) Ltd
Property size:	299.95 ha
Study area size:	255 ha
Development footprint size:	203 ha
Centre coordinates of site:	26°48'3.35"S, 27°39'2.75"E
Technical Details – Solar PV Facility	
Capacity	Up to 150 MW _{ac}
Installed PV panel height	Up to 3 m
Number of PV panels	Up to 304 252

Component	Vlakfontein Solar PV Facility
Mounting structures	Single Axis Tracking, Dual Axis Tracking or Fixed Axis Mounting System Technology
Inverters	Centralised or String Inverter Stations and Power Transformers
Cabling	Underground Direct Current (DC) and Alternating Current (AC) cables of up to 33 kV
Electrical Infrastructure	
IPP Substation capacity	33 / 132 kV
IPP Substation footprint	2.5 ha
Cabling	Underground and overhead transmission lines (up to 33 kV)
Grid Connection corridor length & width	Up to 3.0 km long and 150 m wide
Grid Connection ¹	<p>Two grid connection corridor alternatives are proposed:</p> <ul style="list-style-type: none"> • Alternative 1 (Preferred): This corridor is 150 m wide and is approximately 2.0 km in length. The proposed grid connection is from the on-site substation (Switching Station) of the proposed Vlakfontein Solar Facility located on Vlakfontein 6/161 and extends for about 0.8 km in a westerly direction across Willow Grange 3/246 before turning about 90° south for 0.6 km across Scafell RE/448, then turning slightly southeast for 0.3 km, terminating at the ESKOM Scafell MTS. This is the shortest most direct route to connect to the ESKOM Scafell MTS. • Alternative 2 - This corridor is 150 m wide and is approximately 3.0 km in length. The proposed grid connection is from the on-site substation (Switching Station) of the proposed Vlakfontein Solar Facility located on Vlakfontein 6/161 and extends for about 1.2km in a westerly direction across Willow Grange 3/246, then 0.7km in a south-westerly direction across Proceedeerfontein 5/100, a further 0.9km in a south-easterly direction and then turns northeast for 0.2km before terminating at the Scafell Eskom MTS located on Scafell RE/448.
Building Infrastructure	
BESS footprint	Up to 2 ha
BESS technology	Solid State or Redox Flow Batteries
Buildings	<ul style="list-style-type: none"> • Operational Control Centre • Operation and Maintenance Area / Warehouse / Workshop / Control Centre and Office • Ablution Facilities • Substation Building
Laydown Area & Associated Infrastructure	
Size of laydown area	Up to 3 ha

¹ The grid connection for the Vlakfontein Solar PV Facility will be subject to a separate Environmental Authorisation process and will require a Basic Assessment (BA) process in support of the application for Environmental Authorisation.

Component		Vlakfontein Solar PV Facility
Buildings and Infrastructure		<ul style="list-style-type: none"> • Permanent Laydown Area • Temporary Construction Camp and Laydown Area • Fencing and Lighting • Lightning protection infrastructure • Telecommunication infrastructure • 400 m³ reservoir, water pipeline and stormwater channels
Supporting Infrastructure		
Main access road		2.5 km long and up to 12 m wide
Internal access road		12 km long and 5 m wide
Support Services		
Water Demand	Construction	Water for Roads - 15ℓ / m ² Water for Civil Works - 400 m ³ / project Water for Domestic Use - 225 m ³ / month
	Operation	Water for PV module cleaning - 18 000 m ³ / annum Water for Domestic Use - 20 m ³ / month Water for Dust Suppression - / m ²
Waste Generation	Construction	<p>General Waste would be managed on site in accordance with the principles of the waste management hierarchy. In terms of specific waste streams, the major sources include:</p> <ul style="list-style-type: none"> • Carboard waste from the panels –Approximately 250 tons of cardboard (per 150 MW). A compactor would be used on site to compress the cardboard boxes in which the PVs are stored in order to reduce the space required for the temporary storage of this waste. • Rubber caps placed on all eight corners of the PV panels (total volumes are uncertain). • Wooden pallets on which the PV boxes arrive. • Plastic wrap. <p>Hazardous Waste may be generated on site depending on the design / type of panel procured. Hazardous waste will be disposed of at a registered facility.</p> <p>Effluent would be managed by means of conservancy tanks (16 000 L in capacity which are cleaned once a month and disposed of at the nearest municipal facility).</p>
	Operation	Effluent would be managed using septic Tanks (16 000 L in capacity which are cleaned 2/3 times a week) or a Clarus Fusion System (16 000 L capacity which are cleaned once every six months), or similar, which utilises a chemical process to recycle water from the Operations and Maintenance Buildings as well as Sub-Station Buildings. This treated water can then be used to water vegetation.
Traffic		It is expected that there will be approximately 2 000 trucks in total over the 12-18-month construction phase, approximately 10-20 trucks per day.

Component	Vlakfontein Solar PV Facility
Employment Opportunities	
Construction Phase	<ul style="list-style-type: none"> At least 230 people however the number of people employed at one time may vary as different contracts and subcontracts on the project are completed at a time onsite.
Operation Phase	<ul style="list-style-type: none"> At least 17 people and this is due to the fact that the staff will mainly be responsible for the daily operations and maintenance activities of the project.
<p>Recruitment for the duration of the project lifecycle will be undertaken in collaboration with local authorities, community leadership structures and agencies and no labourers will be hired onsite. Mainstream will therefore implement mitigation and management measures to ensure that no employee or job applicant is discriminated against on the basis of race, gender, nationality, age, religion, or sexual orientation.</p>	

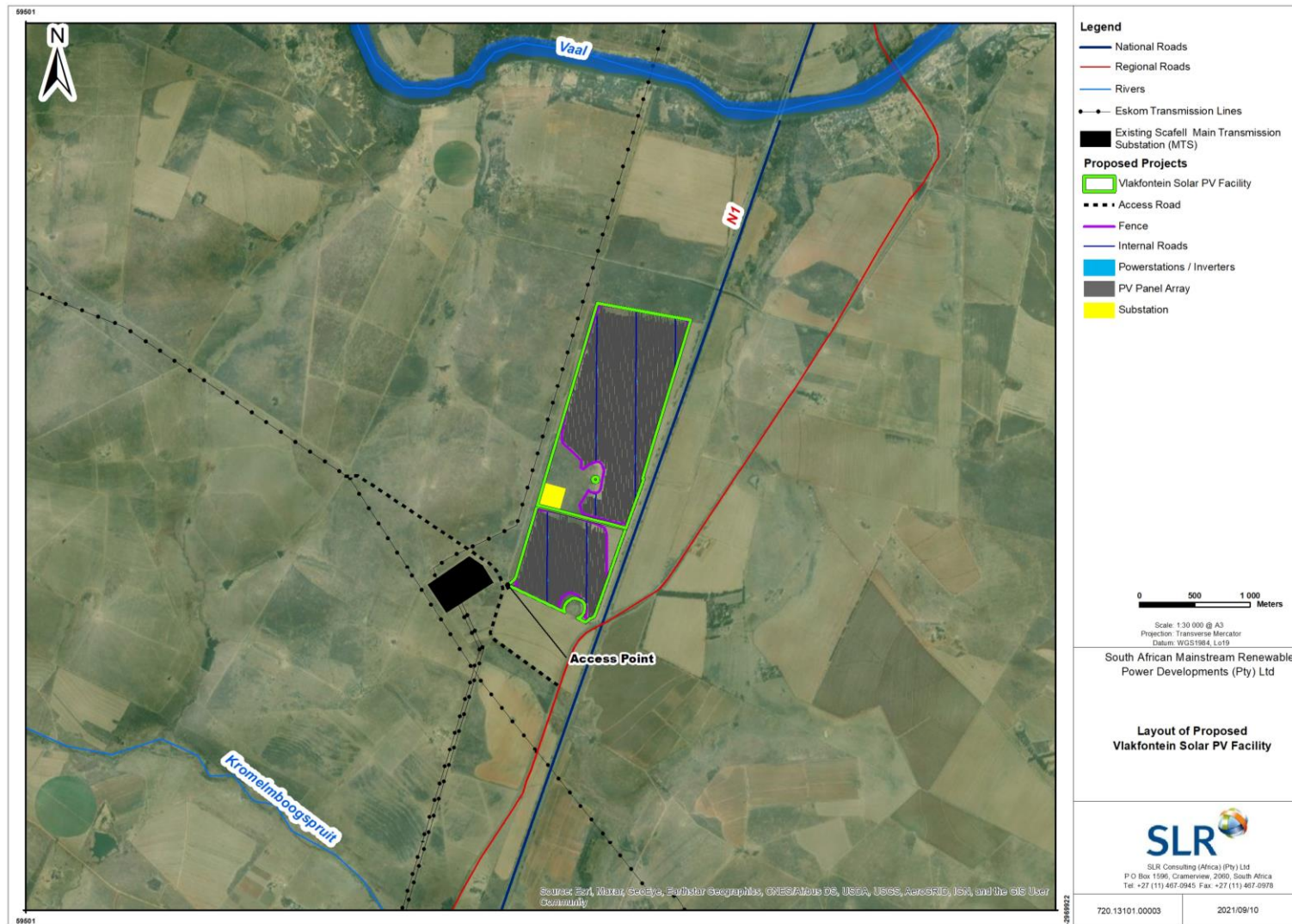


Figure 1-3: Indicative layout map of the Vlakfontein Solar PV Facility

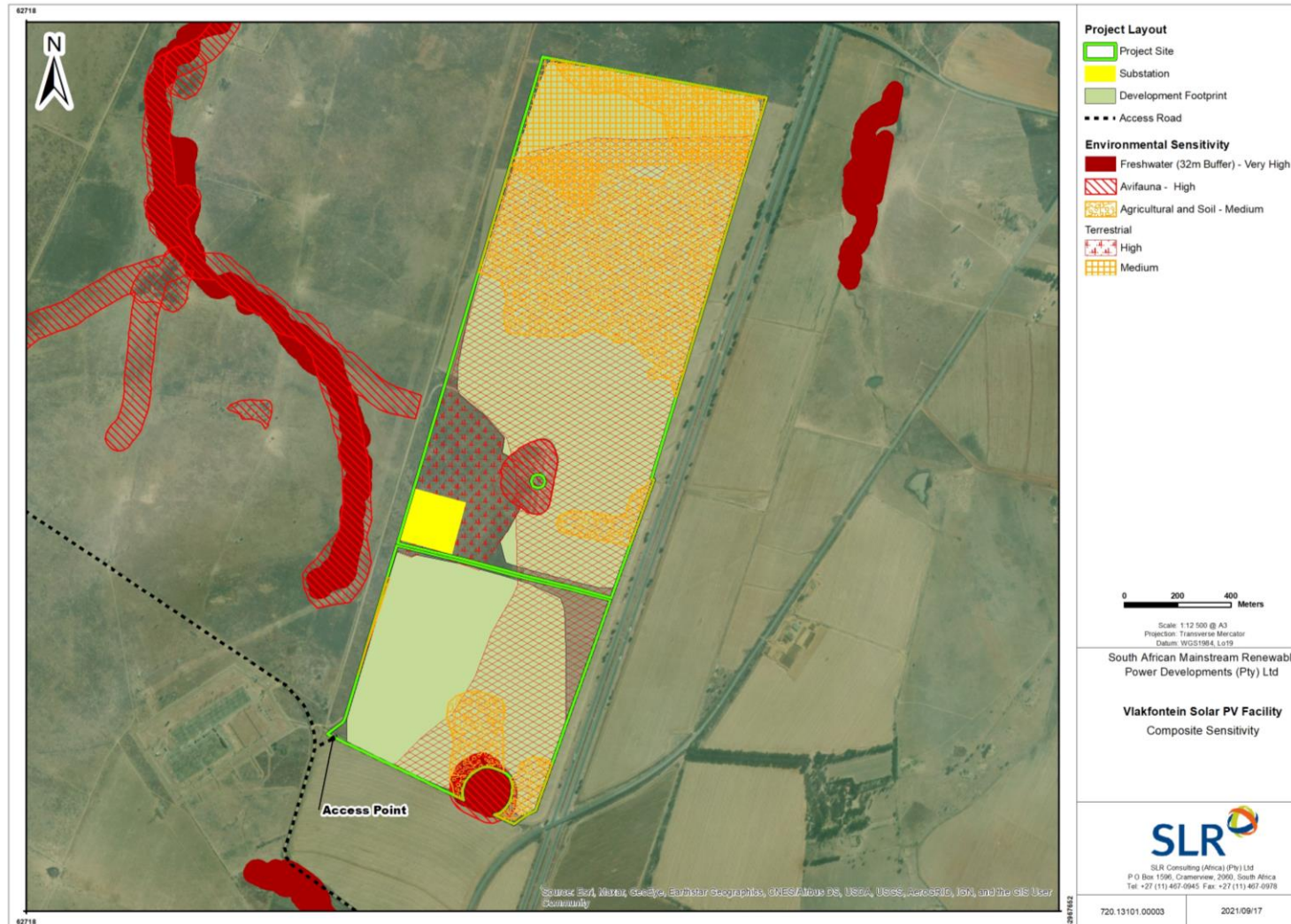


Figure 1-4: Composite Environmental Sensitivity Map of the project site

1.3 AIM OF THIS DOCUMENT

The purpose of this EMPr is to ensure that impacts associated with the construction phase(s) are avoided and, where they cannot be avoided, are kept to a minimum and rehabilitated. The EMPr, which has as its basis the mitigation measures listed in the EIA Report, sets environmental targets for the Contractor (or selected sub-contractors) and reasonable standards against which the Contractor's performance can be measured during the construction phase.

This document will form the basis for the environmental specifications that the Contractor, in terms of the construction contract, will be obliged to adhere to during construction. This document will be included in the contract documentation for the construction phase and will thus form a binding agreement between the Contractor and the Applicant (Mainstream).

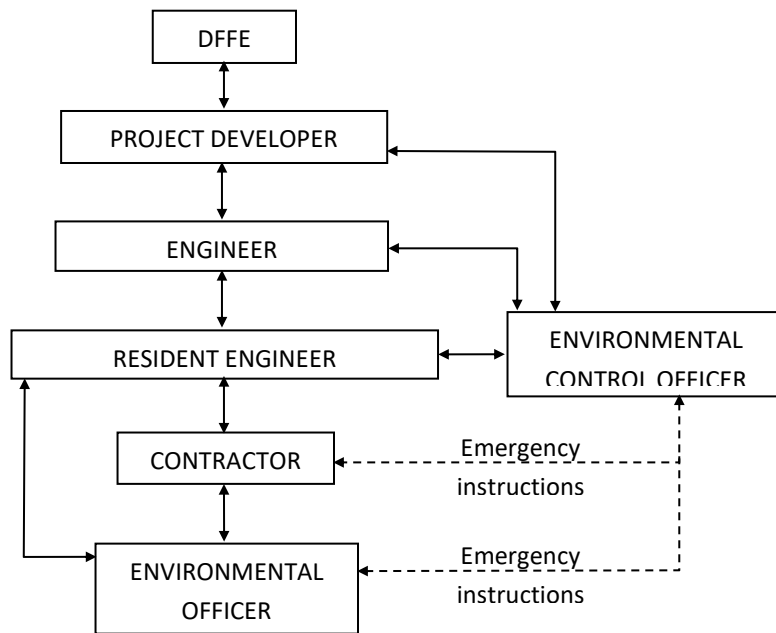
1.4 STATUS OF THIS DOCUMENT

The development and implementation of environmental specifications is an on-going process that is iterative in nature. Any significant revisions to the EMPr document must be approved by the Department of Forestry, Fisheries, and the Environment (DFFE) before the EMPr is revised.

2. ADMINISTRATION AND REGULATION OF ENVIRONMENTAL OBLIGATIONS

2.1 ORGANISATIONAL STRUCTURE

Details of the management structure for this EMPr are presented below. All official communication and reporting lines including instructions, directives and information shall be channelled according to the management structure presented below.



2.2 ROLES AND RESPONSIBILITIES

The implementation of this EMPr requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during the construction phase.

2.2.1 Department of Forestry, Fisheries, and the Environment

DFFE is the designated authority responsible for authorising this EMPr and has overall responsibility for ensuring that the Project Developer complies with this EMPr, and any conditions listed in the Environmental Authorisation. DFFE shall also be responsible for approving any significant amendments that may be required to the EMPr. DFFE may further perform random site inspections to check compliance with the Construction EMPr.

2.2.2 Project Developer

The Project Developer, Mainstream, is ultimately responsible for the implementation of the EMPr and the financial cost of all environmental control measures. Mainstream must ensure that any person acting on its behalf complies with the conditions / specifications contained in this EMPr. Mainstream is responsible for the appointment of an Engineer, Contractor and Environmental Control Officer (ECO). Once appointed, the name and contact details of the ECO must be submitted to the DFFE's Director for Compliance Monitoring.

Mainstream shall address any site problems pertaining to the environment at the request of the DFFE, Engineer and / or the ECO.

2.2.3 Engineer

The Engineer shall oversee the planning, design, and construction phases of the project.

The Engineer shall appoint a Resident Engineer (RE) to act as Mainstream's on-site implementing agent. The Engineer shall address any site problems pertaining to the environment at the request of the RE and / or the ECO. The Engineer shall also be responsible for issuing penalties for contravention of the EMPr.

2.2.4 Resident Engineer

The RE shall act as Mainstream's on-site implementing agent and has the responsibility to ensure that their obligations are executed in compliance with the EMPr. Any on-site decisions regarding environmental management are ultimately the responsibility of the RE. The RE shall assist the ECO where necessary and shall have the following responsibilities in terms of the implementation of this EMPr:

- Reviewing and approving the Contractor's Method Statements with input from the ECO where necessary;
- The day-to-day monitoring and verifying that the EMPr and Method Statements are adhered to at all times and taking action if specifications are not followed;
- Keeping a photographic record of construction activities on site;
- Assisting the Contractor in finding environmentally responsible solutions to problems with input from the ECO where necessary;
- Ordering the removal of person(s) and/or equipment not complying with the EMPr specifications;
- Issuing fines for transgressions of site rules and penalties for contravention of the EMPr;
- Delaying any construction activity if he/she believes the environment has been or is likely to be seriously harmed / impacted;
- Providing input into the ECO's ongoing review of the EMPr; and
- Communicating environmental issues to the Environmental Officer.

2.2.5 Contractor

The Contractor shall have the following responsibilities:

- To implement all provisions of the EMPr. If the Contractor encounters difficulties with specifications, he / she must discuss alternative approaches with the RE and / or the ECO prior to proceeding;
- To ensure that all staff, including Sub-contractors, are familiar with the EMPr;
- Monitoring and verifying that the environmental impacts are kept to a minimum;
- To make personnel aware of environmental issues and to ensure they show adequate consideration of the environmental aspects of the project;
- To prepare the required Method Statements (see Section 2.6);
- To report any incidents of non-compliance with the EMPr to the RE and / or the ECO; and
- To rehabilitate any sensitive environments damaged due to his / her negligence. This shall be done in accordance with the RE's specifications.
- Failure to comply with the EMPr may result in fines (see Section 2.11) and reported non-compliance may result in the suspension of work or termination of the contract by the Engineer.
- The Contractor shall appoint, at his / her own cost, a competent individual as the on-site Environmental Officer (EO) or Site Agent. The EO must be appropriately trained in environmental management and must

possess the skills necessary to impart environmental management to all personnel involved in the contract.

2.2.6 Environmental Control Officer

ECO's duties shall include, *inter alia*, the following:

- Reviewing Method Statements;
- Advising the Contractor and / or the RE on environmental issues within defined construction areas;
- Undertaking regular site visits to ensure compliance with the EMPr and verifying that environmental impacts are kept to a minimum throughout the contract;
- Completing environmental checklists during site visits;
- Keeping a photographic record of progress on site from an environmental perspective;
- Assisting the Contractor, EO and / or the RE in finding environmentally acceptable solutions to construction problems;
- Recommending additional environmental protection measures should this be necessary;
- Assisting the RE in ensuring that the necessary environmental authorisations and permits have been obtained;
- Presenting the initial environmental awareness training course to the Contractor's site management staff;
- Ensuring that DFFE is informed of work progress on site;
- Reporting any incidents that may or have caused damage to the environment or breaches of the EMPr to DFFE;
- Recommending the issuing of fines for transgressions of site rules and penalties for contraventions of the EMPr (via the RE);
- Advising on the removal of person(s) and / or equipment not complying with the specifications (via the RE); and
- Compiling a final environmental audit report at the conclusion of the construction phase for submission to DFFE and Engineer within 30 days of site handover.
- The ECO shall visit the site monthly per development phases, or more frequently as required during the initial stages of construction.
- The ECO shall communicate directly with the RE. Should problems arise on site that cannot be resolved between the ECO and the RE, the ECO shall take the matter up with the Engineer and / or Mainstream. If Mainstream does not respond the ECO shall take the matter up with DFFE.

2.2.7 Environmental Officer

The EO shall be responsible for monitoring, reviewing, and verifying the Contractor's compliance with the EMPr during the construction phase. The EO's duties in this regard shall include, *inter alia*, the following:

- Monitoring and verifying that the EMPr and Method Statements are adhered to at all times and taking action if specifications are not followed;
- Monitoring and verifying that environmental impacts are kept to a minimum;
- Inspecting the site on a daily basis with regard to compliance with the EMPr;
- Keeping accurate and detailed records of these inspections;
- Completing weekly checklists;

- Assisting the RE and ECO in finding environmentally responsible solutions to problems;
- Supervision of work where environmental management is a key aspect (e.g., in sensitive areas, with high environmental risk, etc.);
- Keeping a record of on-site incidents and accidents and how these were dealt with;
- Reporting any incidents of non-compliance with the EMPr to the RE and / or the ECO; and
- Keeping a register of complaints on site and recording community comments and issues, and the actions taken in response to these complaints.

2.3 EMPr ADMINISTRATION

Copies of the EMPr shall be made available to the Engineer, RE, Contractor, EO and the ECO.

Copies of this EMPr shall be kept at the site office(s) and shall be distributed to all senior contract personnel. All senior personnel shall be required to familiarise themselves with the contents of this document.

The EMPr must be updated where the findings of the environmental audit reports indicate insufficient mitigation of environmental impacts associated with the proposed project, or insufficient levels of compliance with the EMPr

Any significant revisions to the EMPr document must be approved by DFFE before the EMPr is revised. The ECO shall be responsible for the implementation and distribution of any “approved” revisions to the EMPr.

2.4 NOTIFICATION OF COMMENCEMENT OF CONSTRUCTION

The ECO shall give DFFE at least two week’s (or as specified in the Environmental Authorisation) written notice to the DFFE prior to the commencement of construction. A general notification letter shall also be sent to neighbouring residents and other relevant stakeholders listed on the EIA the EIA database.

2.5 INFORMATION BOARD(S)

The Contractor shall be responsible for erecting information boards on site. The number and locations of these boards shall be agreed upon by the Engineer.

The contents of the information board shall be provided by the Engineer and will essentially be to advise the public of the construction operation and the prohibition on entering certain areas. The information board shall also provide the name and contact number of the RE, EO and ECO.

2.6 METHOD STATEMENTS

The Contractor shall submit written Method Statements to the RE and ECO for all environmentally sensitive aspects of the work. A Method Statement Control Sheet, signed by the Contractor, must accompany each Method Statement. Method Statements shall cover applicable details with regard to:

- Construction procedures;
- Materials and equipment to be used;
- Getting equipment to and from site;
- How the equipment / material will be moved while on site;

- How and where material will be stored;
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- Timing and location of activities;
- Compliance / non-compliance with the Specifications; and
- Any other information deemed necessary by the Engineer, RE or ECO.

Method Statements shall be submitted to the RE and ECO **at least five (5) days** prior to the commencement of operations. It should be noted that Method Statements must contain sufficient information and detail to enable the RE and ECO to apply their minds to the potential impacts of the works on the environment. The Contractor will also need to thoroughly understand what is required of him / her in order to undertake the works.

Work shall not commence until Method Statements have been approved by the RE. Failure to submit Method Statements may cause the RE to order the Contractor to suspend part or all of the works concerned until a Method Statement has been submitted and approved. Failure to submit Method Statements at least five days prior to commencing the relevant activity may also result in a fine. Any damage caused to the surrounding environment by work done without prior approval shall be rehabilitated at the Contractor's cost.

Based on the specifications in this EMPr, the following Method Statements are required as a minimum:

- MS1:** Construction camp location and layout (Section 3.1);
- MS2:** Site clearing (Section 3.3);
- MS3:** Hazardous substances (Section 3.7.1);
- MS4:** Solid waste management (Section 3.7.2);
- MS5:** Wastewater (Section 3.7.3);
- MS6:** Erosion and sediment control (Section 3.8);
- MS7:** Cement and concrete batching (Section 3.17);
- MS8:** Fire control (Section 3.11);
- MS9:** Dust control programme (Section 3.12);
- MS10:** Alien Plant Control and Management Plan (Section 3.20);and
- MS11:** Vegetation Rehabilitation Plan (Section 3.19).

The RE and / or the ECO shall specify any additional Method Statements that may be required. Where relevant the Method Statements indicated above can be combined on agreement with the RE or ECO.

2.7 ENVIRONMENTAL AWARENESS PLAN AND TRAINING

Before the commencement of any work on site, the Contractor's site management staff shall attend an environmental awareness-training course presented by the ECO. The Contractor shall liaise with the ECO prior to the commencement date of construction to fix a date and venue for the course.

The information presented at the course shall be communicated by the Contractor to the rest of his Employees on the site, to any new Employees coming onto site after the initial training course and to his / her suppliers. The presentation shall be conducted, as far as is possible, in the Employees' language of choice. As a minimum, training shall include:

- Explanation of the importance of complying with the EMPr;

- Discussion of the potential environmental impacts of construction activities;
- Explanation of the management structure of individuals responsible for matters pertaining to the EMPr;
- Employees' roles and responsibilities, including emergency preparedness;
- Explanation of the mitigation measures that must be implemented when carrying out their activities;
- Explanation of the specifics of the EMPr and its specification; and
- Explanation of the Environmental Do's and Don'ts (see Appendix A).

In addition, prior to the commencement of any work on site, the ECO and EO shall attend a briefing session by an archaeologist / palaeontologist. The briefing should provide for the following:

- The importance of archaeological / palaeontological resources;
- Legislation governing heritage / palaeontology resources;
- Site / artefact / fossil identification;
- Sampling / data collection and management; and
- Permit requirements and application process.

The Contractor shall keep records of all environmental training sessions, including names of attendees, dates of their attendance and the information presented to them. Records of environmental training sessions shall be submitted to the ECO.

2.8 MEETINGS

Mainstream, Engineer, Contractor, RE, EO and ECO shall attend scheduled construction site meetings on a monthly basis throughout the contract period.

2.9 INSPECTION PROCEDURES

The day-to-day monitoring and verification that the EMPr is being adhered to shall be undertaken by the RE and the EO.

The ECO shall be permanently based on site until the completion of the construction and rehabilitation activities or visit and inspect the site once a month to ensure that correct operational procedures are being implemented and that the Contractor is complying with the environmental specifications in the EMPr. Additional site inspections by the ECO may be needed during the initial and final stages of the project.

The ECO shall address any queries to the RE. If the queries cannot be resolved at this level, they shall be referred to the Engineer and, if necessary, to Mainstream.

2.10 RECORD OF ACTIVITIES

The RE, ECO and EO shall keep a record of activities on site, including but not limited to meetings attended, Method Statements received and approved, issues arising on site, cases of non-compliance with the EMPr, penalties / fines issued, and corrective action taken to solve problems that arise. In addition, the Contractor shall keep a record of complaints from I&APs.

The RE and EO shall undertake photographic monitoring of the contract. This shall include a photographic record of all areas that will be impacted by the construction activities prior to construction activities commencing. The ECO shall monitor all sensitive work environments, which may also include photographic monitoring.

2.11 FINES

A system of fines shall be implemented to ensure compliance with the EMPr (see Appendix B). Where the Contractor inflicts non-repairable damage upon the environment or fails to comply with any of the environmental specifications of the EMPr this would constitute a breach of Contract for which the Contractor may be liable to pay a fine. The Contractor is deemed not to have complied with the EMPr if:

- There is evidence of contravention of the EMPr specifications, including any non-compliance with an approved Method Statement;
- Construction activities take place outside the defined boundaries of the site;
- Environmental damage ensues due to negligence;
- The Contractor fails to comply with corrective or other instructions issued by the Engineer within a specific time period; and/or
- The Contractor fails to respond adequately to complaints from the public.

If excessive infringement with regard to any of the above (as determined by the Engineer) is registered, then I&J reserves the right to terminate the Contractor's contract.

The system of fines shall be implemented in the following way:

- Fines shall be issued per incident at the discretion of the Engineer;
- Fines shall be issued in addition to any remedial costs incurred as a result of non-compliance with the environmental specifications;
- The Engineer shall inform the Contractor of the contravention and the amount of the fine, and will deduct the amount from the Contractor's monthly Payment Certificates; and
- Fines, including but not limited to those activities presented in Appendix 3, shall be imposed by the Engineer on the Contractor, his staff and / or the Sub-contractors' staff for contravention of the environmental specifications. Where there are ranges, the amount shall depend on the severity and extent of the damage done to the environment.

Failure by any Employee of the Contractor or their sub-contractors to show adequate consideration to the environmental aspects of the contract shall be considered sufficient cause for the RE or ECO to recommend to the Engineer to have that Employee removed from the site. The RE or ECO may, through the Engineer, also order the removal of equipment that is causing continual environmental damage.

2.12 INTERNAL REVIEW AND AUDITING

The Contractor and EO shall establish an internal review procedure to monitor the progress and implementation of the EMPr.

Where necessary, and upon the recommendation of the RE and / or the ECO, procedures that require modification shall be changed to improve the efficiency of the EMPr. Any significant revisions to the EMPr

document must be approved by DFFE and recorded in the revised EMPr. Any non-significant changes or adjustments to the EMPr shall be registered in the daily records of the RE. Adjustment and update of the original EMPr document is not required when these ad hoc changes are made.

At the conclusion of construction (including rehabilitation) phase, an environmental audit report shall be compiled and submitted to DFFE. This report shall be compiled by the ECO, in collaboration with the RE, EO and the Contractor. It shall, as a minimum, outline the implementation of the EMPr, and highlight any problems and issues that arose during the construction period to report, on a formal basis, the lessons learned from this project.

2.13 PERMITS AND LICENCES

2.13.1 Site Clearance

Mainstream shall apply for the following permits / authorisations prior to construction:

- A floral permit from the Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA) for the translocation / removal of provincially protected species such as *Aloe dayvana*, *Crinum bulbispermum*, *Helichrysum chionosphaerum*, *Helichrysum acutatum* and *Boophone disticha* species following the undertaking of a walk-down survey with an ecological specialist;
- Permits from DFFE or any other relevant authority for the relocation / removal of Red Data-listed species; and
- Water Use Authorisation (i.e., General Authorisation, or Water Use License) from the Regional Head of Department of Water and Sanitation (DWS) prior to construction.

The ECO should submit all licenses and permits to the DFFE for their records.

2.13.2 Archaeological Permit

An archaeologist shall inspect the site for surface archaeological resources once vegetation clearing operations have been completed, but prior to the commencement of bulk earthworks. If surface archaeological resources are visible, these might need to shovel be tested if specified by the archaeologist, under permit, to determine the potential significance of the deposits. Thus, if necessary, it is recommended that the ECO or an appointed archaeologist apply to the South African Heritage Resources Agency (SAHRA), or any other relevant authority for a collection (disturbance) permit prior to shovel testing.

3. ENVIRONMENTAL SPECIFICATIONS

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
3.1	Construction Camps	Damage to the environment is avoided or minimised	<ul style="list-style-type: none"> The construction camp(s) shall be located at an easily accessible point(s) and within an area of low environmental sensitivity; No camp establishment shall be allowed within 32 m of any watercourse or drainage channel, or in any area that could cause nuisance or safety hazards to the surrounding landowners, businesses, or the general public. Construction material stockpiles shall be established in disturbed areas; The RE and ECO shall approve the final location of all camp(s) prior to its establishment; The area outside the construction camp(s) fence is considered to be a 'No-Go' area; and The Contractor shall submit a MS indicating the location, preparation, and layout of the construction camp(s). The plan shall include the location and layout of waste storage and treatment facilities, ablution facilities, stockpiling and spoil areas and hazardous material storage area. The demolition and removal of these facilities on completion of construction works shall also be detailed. 	Contractor	Prior to construction	Approved MS indicating the location, preparation and layout of the construction camps and laydown areas. Map / plan of construction camps and laydown areas. RE approval for the final location of construction camps and laydown areas.	Site Inspections and Audits.
			<ul style="list-style-type: none"> The Contractor, RE and ECO shall agree on mutually acceptable location(s) for the establishment of the camp(s); The construction camp(s) shall be demarcated by a fence, the position of which will be agreed by the RE, ECO and the Contractor; 	Contractor, RE and ECO			

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> The spacing of top two wires of the construction camp(s) fence should be increased to a minimum of 30 cm to reduce the risk of snaring; Suitable signs must be erected to clearly demarcate the construction camp(s); and Access to the construction camp(s) should be controlled by a guard or otherwise monitored to prevent unlawful access. 				
		Clean and well-maintained ablution facilities provided in suitable locations	<ul style="list-style-type: none"> The Contractor shall provide suitable sanitary arrangements (e.g., chemical toilets) as per building guidelines (SABS 0400). There should be one toilet for every 15 workers on site (Operational Health and Safety Act No. 85 of 1993); Toilets must be easily accessible and shall be secured in order to prevent them from blowing over; Toilets shall not be more than 50 m away from where construction activities are being undertaken; Toilets shall not be sited within 32 m of drainage channels or areas of sensitive natural vegetation; The Contractor shall be responsible for ensuring that all ablution facilities are maintained in a clean and sanitary condition to the satisfaction of the RE or ECO; The Contractor shall provide toilet paper; The Contractor shall appoint a suitable Sub-contractor to empty toilets on a regular basis; 	Contractor	Prior to construction	Ablution service records. Incident Reports.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> The Sub-contractor shall ensure that there is no spillage when the chemical toilets are cleaned and that the contents are properly removed from site; The Contractor shall be responsible for enforcing the use of these facilities; and Performing ablutions outside of established toilet facilities is strictly prohibited. 				
			<ul style="list-style-type: none"> Toilet/s shall be located within the construction camp and in construction areas where there will be a concentration of labour. The siting of toilets shall be done in consultation with the RE or ECO to ensure that they are easily accessible for employees. 	Contractor, RE and/or ECO			
		Effective housekeeping	<ul style="list-style-type: none"> The Contractor shall provide adequate refuse bins with lids at all eating areas to the satisfaction of the RE and shall ensure that all eating areas are cleaned up on a daily basis; Any cooking of food on site shall be done using gas cookers; and No surface water sources shall be used for washing of pots, plates, clothing, etc. 	Contractor	Prior to and during construction	RE approval. Clean eating areas.	Site Inspections and Audits.
			<ul style="list-style-type: none"> The Contractor shall establish eating areas, as agreed with the RE. These areas shall provide adequate temporary shade to ensure that employees do not move off-site to eat; and Collected waste shall be stored in a central waste area within the construction camp that has been approved by the RE and ECO; 	Contractor, RE and/or ECO			

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
		Safe supply of drinking water	<ul style="list-style-type: none"> The Contractor shall be responsible for ensuring that there is access to clean drinking water for all employees on site; and If water is stored on site, drinking water and multi-purpose water storage facilities shall be clearly distinguished and demarcated. 	Contractor	Prior to construction	Clearly marked drinking water storage and supply points.	Site Inspections and Audits.
		Effective housekeeping	<ul style="list-style-type: none"> All construction areas shall be kept neat and tidy at all times. Different materials and equipment shall be kept in designated areas and storing / stockpiling shall be kept orderly; and The Contractor shall take reasonable measures (e.g., visual screening using shade cloth in combination with fencing to screen the construction site, equipment, and materials) to ensure that the construction camp does not have an unreasonable impact on the aesthetics of the area or cause a reasonably avoidable disturbance to the surrounding users. 	Contractor	Daily, during construction	Clean construction areas. Designated and well-managed material storage areas. Photographs.	Site Inspections and Audits.
		Prevention of community conflict and unsupervised activities	<ul style="list-style-type: none"> No living accommodation shall be available on site for any of the Contractor's employees and no employees will be allowed to sleep overnight on site. 	Contractor	Prior to construction	Letter of consent from the RE for night watchman.	Site Inspections and Audits.
			<ul style="list-style-type: none"> A night watchman shall be allowed within the construction camp with written permission from the RE. 	Contractor and RE			

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
3.2	Site demarcation and No-Go areas	Access to No-Go areas is prevented	<ul style="list-style-type: none"> In order to limit the impact of construction activities, the Contractor shall limit activities to workspaces as defined at the site inspection during the tender process and subsequently as agreed with the RE and ECO. Construction works shall be confined to the proposed development footprint, where possible, and no materials shall be distributed into naturally vegetated areas adjacent to the development footprint. The site shall be fenced prior to site clearing activities; Areas where construction activities are prohibited are referred to as No-Go areas and shall be demarcated to ensure that environmentally sensitive areas are not impacted by the construction activities. Any work required to take place outside of these areas shall only be undertaken once the RE and ECO has approved such work; No-Go areas shall include all areas outside of the defined work spaces as determined during the tender process; The RE may declare No-Go areas at any time during the construction phase as deemed necessary and / or at the request of the ECO; Areas required for construction purposes shall also be demarcated, in consultation with the ECO and / or RE, prior to the commencement of site clearing activities; No-Go areas shall be demarcated by fencing of at least three strands of wire, the position of which will be agreed by the RE and ECO, and appropriate signage; Entry into these areas without the ECO's permission will result in a penalty; and 	Contractor, RE and/or ECO	Daily, during construction	Clear demarcations of construction areas and No-Go areas. Photographs.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> The Contractor shall be responsible for any clean-up and / or rehabilitation of all areas impacted outside the site. 				
3.3	Permitting requirements: Vegetation clearing	Unnecessary removal of protected plant species present within the project site and surrounding areas	<ul style="list-style-type: none"> Species protected under the Free State Nature Conservation Ordinance, 1969 (Ordinance No. 8 of 1969) (FSNCO) were recorded on site. Suitable habitat for such species is present, especially in the within the <i>Seriphium</i>-dominated Grassland subunit. A walkdown of the footprint area is required before construction activities commence where anticipated floral species of Conservation concern (SCC) / protected species are searched and marked (if encountered); and 	Project Developer	Prior to Construction	Appointment of botanist / ecologist to undertake a walkdown of the project footprint Permits are obtained from DESTEA for the removal / translocation of SCCs within the project footprint	Proof of appointment and walkdown report is available in the EMPr file Permits are available in the EMPr file for audits and inspections

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> If SCC / protected species are encountered and will be affected by the construction activities, these species must be marked and where possible, relocated to suitable habitat surrounding the disturbance footprint. Suitable habitat is available in nearby surrounding locations. For the removal, destruction, or relocation of protected flora in terms of the FSNCO, a license is required from the Free State Department of Economic Development, Tourism and Environmental Affairs (DESTEA). 				
3.4	Site clearing: Management of Alien Invasive Plants (AIPs)	Management of alien invasive plants	<ul style="list-style-type: none"> Compile an Alien Invasive Management / Control Plan for implementation prior to construction. The Plan should be approved by the RE and the ECO; AIPs should be cleared within the PV Facility before any vegetation clearing activities commence, thereby ensuring that no AIP propagules are spread with construction rubble, or soils contaminated with AIP seeds during the construction phase; No use of uncertified chemicals may be used for chemical control of AIPs. Only trained personnel are to use chemical and mechanical control methods of AIPs. Chemical control may not be used within the Freshwater Habitat; Alien vegetation that is removed must not be allowed to lay on unprotected ground as seeds might disperse upon it. All cleared plant material to be disposed of at a licensed waste facility which complies with legal standards; and 	EO	Prior to Construction Daily, during construction	AIP Management Plan is compiled Photographs Training records of staff are provided in the EMP file Proof of disposal records of AIPs at a licensed waste facility are available.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> Ongoing alien and invasive plant monitoring and clearing / control should take place throughout the construction phase of the development, and a 30 m buffer surrounding the study area should be regularly checked for AIP proliferation and to prevent spread into surrounding natural areas. 				
3.5	Site clearing: Vegetation clearing	Unnecessary removal of indigenous vegetation is prevented	<ul style="list-style-type: none"> No vegetation clearing shall take place without written approval of the Method Statement by the RE; Implement an Alien Invasive Management / Control Plan prior to the commencement of construction activities; The development footprint shall be clearly demarcated (with fencing or coloured rope) prior to any development, so that the Contractors are aware of the physical constraints (see Section 3.2). Demarcation of the site would ensure that impacts on adjacent areas of natural vegetation are avoided; No cut vegetation shall be burnt on site, unless the necessary approvals have been obtained from the local authority; Before clearing of vegetation, the Contractor shall ensure that all litter and non-organic material is removed from the area to be cleared; Vegetation clearing shall take place in a phased manner in order to retain vegetation cover for as long as possible in order to reduce the size of areas where dust can be generated by wind; and Invasive alien eradication is presented in Section 3.20 	Contractor	Prior to Construction	Approved MS for Vegetation Clearing. No excessive vegetation clearance. Appointment of horticulturist. Waste disposal slips. No signs of burnt vegetation. Photographs.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> The ECO and EO must ensure that the natural areas to be cleared are kept to the absolute minimum required for the development and attempt to incorporate green belts within the development, where possible. 	ECO and EO			
			<ul style="list-style-type: none"> All remaining indigenous plant material removed from cleared areas shall be stockpiled for mulching. All remaining vegetation shall be removed and disposed of at an approved landfill site. Stockpiling of cut vegetation shall only be permitted in areas indicated by the RE and / or the ECO. 	Contractor, RE and/or ECO			
3.6	Site clearing: Disturbance on Avifauna	Prevent unnecessary displacement of avifauna	<ul style="list-style-type: none"> No off-road driving; Maximum use of existing roads where possible; Best Practice Guideline measures to control noise and dust should be implemented; and Access to areas outside of the construction camp(s) should be restricted. 	Contractor and ECO	Daily, during construction	Low mortality of avifauna due to construction vehicles and equipment outside of the construction camp(s) No complaints regarding noise and dust are reported by surrounding Landowners	Site Inspections and Audits.
			<ul style="list-style-type: none"> Appointment of a rehabilitation specialist to develop a Rehabilitation Plan; and Site inspections to monitor rehabilitation progress. 	Project Developer ECO	Once-off Daily, during rehabilitation	All disturbed areas are rehabilitated in line with the recommendations of the rehabilitation specialist	Site Inspections and Audits.
3.7	Site clearing: Topsoil	Minimal loss of topsoil	<ul style="list-style-type: none"> The Contractor shall remove topsoil (an approximately 150 mm layer) from all areas to be disturbed during construction activities, including temporary activities such as storage and stockpiling, and stockpiled for rehabilitation purposes; 	Contractor	Daily, during construction	Well-managed and placed topsoil stockpiles. No alien invasive plant species on topsoil stockpiles. Photographs.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> • Topsoil shall only be stripped after the initial invasive alien vegetation clearing (if applicable) has been undertaken to ensure that fewer alien seeds are present in the topsoil that is used for landscaping and vegetation rehabilitation after completion of construction; • Topsoil stockpiles shall be convex and no more than 2 m high; • Ensure that no topsoil enters any watercourse; • Topsoil stockpiles shall not be subject to compaction greater than 1500 kg/m² and shall not be pushed by a bulldozer for more than 50 m; • Topsoil stockpiles shall be monitored regularly to identify any alien plants, which shall be removed when they germinate to prevent contamination of the seed bank; • Stockpiles shall not be covered with materials such as plastic that may cause it to compost or would kill the seed bank; • Any topsoil contaminated by hazardous substances shall not be used but shall be disposed of at a licensed landfill site; • The Contractor shall be held responsible for the replacement, at his / her own cost, for any unnecessary loss of topsoil due to his failure to work according to the requirements of this EMP; and • All topsoil stockpiles and windrows shall be maintained throughout the contract period in a weed-free condition. Weeds appearing on the stockpiled or windrowed topsoil shall be removed by hand. 				

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> Stockpiles shall be located in areas agreed to by the RE and ECO; and Appropriate measures, as agreed with the RE, shall be taken where necessary to protect topsoil stockpiles from erosion by wind or water by providing suitable stormwater cut-off drains, containment using hessian or similar material and / or by establishing suitable temporary vegetation. 	Contractor, RE and ECO			
3.8	Site clearing: Topsoil	Effective management of topsoil	<ul style="list-style-type: none"> This soil shall be used for rehabilitation purposes by first spreading it over the excavated slopes without interfering with or contaminating the stockpiled topsoil; Whilst in stockpile it shall be maintained free from erosion and weed infestation in the same way as for topsoil stockpile maintenance; and The Contractor shall submit a site clearing Method Statement for all areas where the Contractor is required to, or intends to, clear vegetation and remove topsoil. This method statement shall clearly detail the demarcation of the site and clearing and how this will be done, where and how cleared material will be stored or disposed of, etc. 	Contractor	Daily, during construction	Well-managed and placed subsoil stockpiles. No alien invasive plant species on subsoil stockpiles. Photographs.	Site Inspections and Audits.
			<ul style="list-style-type: none"> The subsoil is the layer of soil immediately beneath the topsoil. It shall be removed to a depth instructed by the RE, and if not used for construction purposes it shall be stored and maintained separately from the topsoil so that neither stockpile is contaminated by the other. 	Contractor and RE			

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
3.9	Materials handling and storage: Handling	Safe passage of goods between destinations	<ul style="list-style-type: none"> The Contractor shall ensure that all suppliers and their delivery drivers are aware of procedures and restrictions in terms of this EMPr; The Contractor (and suppliers) shall ensure that all materials are appropriately secured to ensure safe passage between destinations; Loads including, but not limited to sand, stone chip, fine vegetation, refuse, paper, and cement, shall have appropriate cover to prevent them spilling from the vehicle during transit. The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials; and The Contractor shall ensure the supervision of the delivery drivers during offloading. 	Contractor	Daily, during construction	Contractor instructions to sub-contractors and suppliers. Well-secured and covered loads (or no overfilled hauling trucks). Photographs.	Site Inspections and Audits.
3.10	Materials handling and storage: Storage of hazardous substances	Effective containment, handling, storage, and disposal of hazardous substances	<ul style="list-style-type: none"> All fuel, oil, and other hazardous substances (i.e., bitumen, paint, etc.) shall be confined to demarcated, adequately bunded areas within the construction camp and stored in suitable containers. If more than 500 m³ is to be stored on site, EA is required from DFFE; The storage of any materials (e.g., cement, oil, fuel, etc.) shall not take place within 32 m of any surface water sources; Hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure; 	Contractor	Daily, during construction	Approved MS for the containment, handling, storage, and disposal of hazardous substances. DFFE approval (if applicable). Suitable hazardous substances storage areas with suitable signage. Adequate warning sign and fire-fighting equipment.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> • The Contractor shall have a copy of the MSDS readily available and ensure that he / she or his / her employees who are required to use such substances are fully conversant with the safe handling precautions, protective equipment to be used and storage precautions to be taken; • The following conditions related to the temporary storage of fuel must be implemented: <ul style="list-style-type: none"> ○ Fuel shall be stored in steel tank(s) supplied and maintained by the fuel suppliers; ○ The fuel tank(s) shall be designed and installed in accordance with relevant Oil Industry standards and SANS codes where applicable for aboveground storage tanks; ○ Tank(s) shall be adequately banded (110% of volume) and shall have some form of oil-water separation. The floor and wall of the bund area shall be impervious to prevent infiltration of any spilled / leaked fuel, oil, or hazardous substance into the soil; ○ During fuel tanker delivery, the tanker driver shall be present at all times during product offloading. Should an incident occur, an emergency cut-off switch must be used to immediately stop fuel delivery - flexible hoses with dry-break couplings and emergency isolation must be used; ○ The requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993), must be adhered to; 			Emergency response plan (with evidence of municipality consultations) MSDS for all hazardous substances on site. Proof of safe disposal of hazardous substances. Incident Reports. Photographs.	

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> ○ Crash barriers shall be installed around the fuel tank(s); ○ An on-site Emergency Plan must be implemented. The Emergency Plan shall be drafted in consultation with the Ngwathe Local Municipalities' Emergency Services. In accordance with Section 30(3) of NEMA, the Emergency Plan shall provide for the notification of the relevant provincial head of DESTEA, the local municipal authorities, police, traffic police, fire departments and local medical services, as applicable; ○ The applicant shall ensure that effective stock inventory monitoring, recording and regular auditing take place for the early identification of possible leaks and keep a leak history for the site; and ○ Within six months of the tank(s) ceasing to be functional for the purpose for which has been authorised, the tank(s) must be removed at the expense of the applicant and the site, including all associated infrastructure, shall be rehabilitated to the satisfaction of the relevant municipality. ● The Contractor shall ensure that run-off from any stockpile, fuel, oil, or hazardous substance storage area is contained and does not enter stormwater drains or pollute any water resources; and 				

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> The Contractor shall submit a Method Statement detailing the location of storage, methods intended for storage of oil, fuel, herbicides, pesticides, and other hazardous / poisonous substances, if applicable. This Method Statement should also detail precautions that shall be implemented to limit spills and leakages of these substances. 				
			<ul style="list-style-type: none"> Suitable fire-fighting equipment, to the approval of the RE, shall be supplied and installed by the Contractor in the hazardous substance's storage area; The relevant Material Safety Data Sheets (MSDS) for all hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) shall be submitted to the RE; and Areas for the temporary stockpiling of excavated material and other construction material shall be as agreed with the RE and ECO. 	Contractor, RE and ECO			
3.11	Materials handling and storage: Storage / use of equipment	Spillage of hazardous substances from equipment is prevented	<ul style="list-style-type: none"> Drip trays shall be provided for stationary plant (such as compressors, pumps, generators, etc.) and for "parked" plant (e.g., mechanised equipment). 	Contractor	Daily, during construction	Drip trays or similar forms of secondary containment (especially for leaking equipment).	Site Inspections and Audits.
			<ul style="list-style-type: none"> All plant, construction equipment, vehicles or other items shall be stored within the construction camp, unless prior arrangements have been made with the RE or ECO. 	Contractor, RE and/or ECO		Photographs.	

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
3.12	Refuelling and maintenance: Refuelling	Spillages during refuelling is avoided	<ul style="list-style-type: none"> Where reasonably practical, vehicles shall only be refuelled in a demarcated refuelling / servicing area (as agreed to with the RE and ECO). No re-fuelling shall be within 32 m of any surface water source or area of natural vegetation; and The surface under the refuelling / servicing area shall be protected against pollution (e.g., the use of drip trays) to the reasonable satisfaction of the RE and ECO prior to any refuelling activities. 	Contractor, RE and/or ECO	Daily, during construction	Demarcated and contained refuelling areas. Incident Reports. Training records. Photographs.	Site Inspections and Audits.
3.13	Refuelling and maintenance: Maintenance of vehicles, plant, and equipment	Contamination of the environment as a result of maintenance activities is prevented	<ul style="list-style-type: none"> All vehicles and equipment shall be kept in good working order and serviced regularly. Leaking equipment shall be repaired immediately or removed from the site; When servicing equipment, drip trays shall be used to collect the waste oil and other lubricants. All hazardous waste from maintenance activities shall be disposed of as specified in Section 3.7.1; and The washing of equipment shall be restricted to urgent maintenance requirements only. All washing shall be undertaken in the maintenance area, and these areas must be equipped with suitable wastewater collection measures (see Section 3.7.3). The use of detergents for washing shall be restricted to low phosphate and nitrate containing, low sudsing-type detergents. 	Contractor	Daily, during construction	Vehicle and equipment maintenance schedule. Spare drip trays available. Proof of safe disposal of hazardous substances and redundant equipment. No signs of washing of equipment/ vehicles in the field. Incident Reports. Photographs.	Site Inspections and Audits.
			<ul style="list-style-type: none"> Where reasonably practical, maintenance activities shall only be undertaken in a demarcated maintenance area (as agreed to with the RE and ECO). No maintenance activities shall be allowed within 32 m of any 	Contractor, RE and/or ECO			

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			surface water source or area of natural vegetation.				
3.14	Accidental leaks and spills	Contamination of the environment as a result of accidental leaks and spills is prevented	<ul style="list-style-type: none"> The Contractor shall ensure that his / her employees are aware of the procedure to be followed for dealing with spills and leaks; Any accidental leak and spill of fuel, oil or other hazardous substances is to be reported to the RE or ECO immediately so that the best remediation method can be quickly implemented; Drip trays shall be used for all pumps, generators, etc. in order to prevent water contamination as a result of fuel spills or leaks; In the event of a hydrocarbon spill, the source of the spillage shall be isolated, and the spillage contained. The area shall be cordoned off and secured; Hydrocarbon contaminated material and/or soil shall be collected and stored in a bunded area until future disposal at a hazardous waste site (Section 3.7.3); The relevant MSDS for all hazardous chemical substances (as defined in the Regulations for Hazardous Chemical Substances) shall be kept on site. Procedures detailed in the MSDS shall be followed in the event of a spill or emergency situation; The Contractor shall be liable to arrange for professional service providers to clear the area affected by the spill, if required; and 	Contractor	Upon accidental leaks and spills	Approved MS is in place for handling accidental leaks and spills. Training records. Incident Reports. Proof of safe disposal of hazardous substances. Absorbent material readily available to absorb / breakdown spills. Proof of notification of large spills to the RE and/or ECO. MSDS for all hazardous substances on site. Photographs.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> The Contractor shall submit a Method Statement detailing the precautions that shall be implemented to limit spills and leakages of these hydrocarbons and other hazardous substances. 				
			<ul style="list-style-type: none"> The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb / breakdown spills. The quantity of such materials shall be able to handle the total volume of the hydrocarbon / hazardous substance stored on site. This material must be accepted by the RE prior to any refuelling activities. 	Contractor and RE			
3.15	Waste Management: Hydrocarbon and hazardous waste	Contamination of the environment as a result of waste management is prevented	<ul style="list-style-type: none"> The Contractor shall prepare and implement a Hazardous Materials and Waste Management Plan prior to site establishment. The plan shall include, but not be limited to, measures to prevent: <ul style="list-style-type: none"> Contamination of soils; Pollution of water; Accidental Fires; and Risk / injury to people or animals. All hydrocarbon (e.g., fuel, oils, and contaminated soil / materials) and other hazardous waste (e.g., herbicides, pesticides, bitumen, tar, etc.) resulting from spills, refuelling and maintenance activities shall be disposed of at a licensed hazardous waste site or, where possible, sold to an approved used-oil recycling company; 	Contractor	Daily, during construction	Approved Hazardous Materials and Waste Management Plan. Suitable containment of stored hazardous waste. Waste classification records. Proof of suitably licensed waste disposal and recycling facilities used. Safe disposal certificates for each load of waste oil and hazardous waste taken off site. No signs of on-site waste disposal/burning.	Site Inspections and Audits. Monthly hazardous waste reconciliation.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> Waste generated must be classified (according to SABS Code 0228 and in accordance with the National Norms and Standards for the Storage of Waste published in GN926) and the volume of hazardous waste produced recorded on a weekly basis. Waste disposal tracking records shall also be kept to trace the transport of waste from site to a registered landfill or hazardous waste site; The Waste Contractor shall maintain records of all materials removed from site and shall provide certificates of safe disposal to the RE; No hazardous waste shall be allowed to accumulate or to be stored on site for longer than 30 days; Used oil, lubricants, cleaning materials, etc. from the maintenance of vehicles and machinery may be collected in holding tanks prior to disposal; No hazardous waste shall be allowed to enter stormwater drains; and No hydrocarbon and hazardous waste shall be burnt or buried on site. Under no circumstances shall the spoiling or burial of tar or bituminous products be allowed on site. Unused or rejected tar or bituminous products shall be returned to the supplier's production plant. 			<p>Records of hazardous waste types, volumes and disposal sites used.</p> <p>Photographs.</p>	
3.19	Waste Management: General waste	Contamination of the environment as a result of waste management is avoided	<ul style="list-style-type: none"> An integrated waste management approach shall be used, based on the principles of waste minimisation, reduction, reuse, and recycling of materials. Containers for glass, paper, metals, and plastics shall be provided; 	Contractor	Daily, during construction	Approved MS for management of general waste.	<p>Site Inspections and Audits.</p> <p>Monthly general waste reconciliation.</p>

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> The Contractor shall remove all construction waste from site at his / her own expense; The Contractor shall provide vermin and weatherproof bins (with lids) of sufficient number and capacity to store solid waste produced on a daily basis. The lids shall be kept firmly shut on the bins at all times in order to prevent litter blowing off-site and into the marine environment; Bins shall be located within the construction camp, eating areas and construction areas where there will be a concentration of labour; Bins shall be emptied on a weekly basis or more frequently as required; All solid waste may be temporarily stored on site in a demarcated area, which meets the satisfaction of the RE; All solid waste shall be disposed of offsite at a licensed landfill site; and No waste material or litter shall be burnt or buried on site. The Contractor shall ensure that all work areas are cleaned on a daily basis. The general cleanliness of the site shall form part of the EO's, RE's and ECO's inspections. 	Contractor, RE, ECO and EO		<p>Proof of suitably licensed waste disposal and recycling facilities used.</p> <p>No litter around site. Presence of suitably designed waste bins.</p> <p>Suitably designed waste storage areas.</p> <p>No signs of on-site waste disposal / burning.</p> <p>Records of general waste types, volumes and disposal sites used.</p> <p>Photographs.</p>	
			<ul style="list-style-type: none"> The stockpiling of construction rubble or other material shall only be permitted in areas approved by the RE; The Contractor shall submit a Method Statement detailing a solid waste control and removal system (storage, provision of bins, site clean-up schedule, bin clean-out schedule, etc.) that is acceptable to the RE and ECO. 	Contractor, RE and/or ECO			

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
3.20	Waste Management: Wastewater	Contamination of the environment as a result of wastewater management is prevented	<ul style="list-style-type: none"> Contaminated water (including contamination with chemicals, oils, fuels, cement, sewage, construction water, water carrying products, etc.) from the construction site(s) should be prevented from entering groundwater, or surface water bodies. Appropriate measures, as agreed with the RE, shall be taken to limit the volume of water entering the site and to improve the water quality before it leaves site (e.g., stormwater cut-off drains, straw bales or geofabric siltation barriers constructed across the site at specific points); Water from any kitchen, showers, sinks, etc. shall be discharged into a conservancy tank (or similar) for removal from the site; No stormwater outlets shall be allowed to flow directly into the sea; No wastewater or contaminated water shall be disposed of into the sea or stormwater drains; and The Contractor shall submit a Method Statement detailing how wastewater is to be collected from all wastewater generating areas (e.g., maintenance areas, batching plants, bunds, etc.), as well as storage and disposal methods. The Method Statement shall also detail the temporary stormwater drainage on site. If the Contractor intends to carry out any on-site wastewater treatment, this shall also be included. 	Contractor	During construction	<p>Approved MS is in place for management of wastewater.</p> <p>Presence of conservancy tank to capture wastewater.</p> <p>Records of collection and disposal of wastewater.</p> <p>No signs of wastewater disposal to the environment.</p> <p>Presence of stormwater cut-off drains upslope of the potential contamination sources.</p> <p>Proof of suitably licensed waste facilities used for wastewater.</p> <p>Photographs.</p>	<p>Site Inspections and Audits.</p> <p>Monthly wastewater reconciliation.</p>

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> The Contractor shall be responsible for the construction and operation of the necessary collection facilities (e.g., conservancy tanks, etc.) in order to prevent pollution and/or settlement of suspended matter, and shall dispose of the collected waste as approved by the RE; and Temporary stormwater drainage from the works shall be designed in collaboration with the RE and ECO. 	Contractor, RE and/or ECO			
3.21	Erosion and sedimentation control	Soil loss and sedimentation of water resources are prevented	<ul style="list-style-type: none"> Drainage measures (such as culverts and structures beneath the road crossings) where required must promote the dissipation of storm water run-off and allow surface and subsurface movement of water along drainage lines so as not to impede natural surface and subsurface flows; The Contractor shall, as an ongoing exercise, provide sedimentation and erosion control to the satisfaction of the RE; During construction, the Contractor shall protect areas susceptible to erosion by installing necessary temporary and permanent drainage works as soon as possible and by taking measures necessary to prevent surface water from being concentrated in streams and from scouring slopes, banks, or other areas; 	Contractor	Ad-hoc (as erosion develops)	Approved MS is in place for erosion and sedimentation control. No concentration of flow within watercourses. Effective erosion control measures at erosion prone areas. Revegetated areas where construction is completed. No signs of excessive erosion. Clear demarcation stabilised areas. Photographs.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> During construction, the Contractor shall implement measures to prevent the migration of material (fines) from the works into any surface water source, i.e., the unchanneled valley bottom wetland system, etc. Appropriate measures, as agreed with the RE, shall be taken to limit the volume of water entering the site and to improve the water quality before it leaves site (e.g., stormwater cut-off drains, straw bales or geofabric siltation barriers constructed across the site at specific points); and A Method Statement shall be developed and submitted to the RE and ECO that indicates how the Contractor shall deal with erosion and sedimentation issues. 				
			<ul style="list-style-type: none"> Any runnels or erosion channels developed during the construction period shall be backfilled and compacted, and the areas restored to an acceptable condition (as determined by the RE); and Stabilisation of cleared areas to prevent and control erosion and/or sedimentation shall be actively managed. The method of stabilisation shall be determined in consultation with the RE and ECO. Consideration and provision shall be made for the following methods (or combination thereof): <ul style="list-style-type: none"> Brush-cut packing (although no alien plant material may be used for this purpose); Mulch or chip cover (although no alien plant material may be used for this purpose); 	Contractor, RE and/or ECO			

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> ○ Straw stabilising (at a rate of one bale/m² rotated into the top 100 mm of the completed earthworks – only straw bales held with string (not wire) may be used); ○ Watering; ○ Planting / sodding; ○ Application of soil binders and anti-erosion compounds; and / or ○ Mechanical cover / packing structures (including the use of Geofabric, hessian cover, log / pole fencing. 				
			<ul style="list-style-type: none"> ● The EO shall demarcate stabilised areas with highly visible indicators, e.g., painted stakes or hazard tape; and ● Traffic and movement over stabilised areas shall be restricted and controlled by the EO, and damage to stabilised areas shall be repaired and maintained by the Contractor to the satisfaction of the RE and ECO. 	Contractor, EO and/or RE and/or ECO			
3.21	Protection of natural features, fauna, and flora	Damage and disturbance to flora and fauna is prevented or minimised	<ul style="list-style-type: none"> ● The Contractor shall not permit his employees to make use of any natural water sources for the purposes of swimming, personal washing and the washing of machinery or clothes; ● No surface or ground water may be polluted due to any activity on the property / site; ● The area of disturbance should be limited to as small an area as will facilitate the execution of the works; 	Contractor	Ad hoc	Training records. No signs of unnecessary vegetation removal or hunting, trapping, shooting, poisoning of fauna.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> Any amphibian, reptile, bird, or mammal encountered during site preparation that cannot flee of its own accord shall be relocated to a suitable area immediately outside of the proposed development footprint; No collection of indigenous floral species must be allowed by construction personnel, especially with regards to floral SCC (if encountered); The Contractor shall ensure that no hunting, trapping, shooting, poisoning, or other activity causing disturbance of any fauna takes place; The feeding of any wild animals is prohibited; and No domestic pets or livestock are permitted on site. 			<p>No signs of unnecessary defacing of natural features.</p> <p>Photographs.</p>	
			<ul style="list-style-type: none"> The Contractor shall not deface, paint, damage or mark any natural features situated on or around the site for survey or other purposes unless agreed beforehand with the RE. Any features affected by the Contractor in contravention of this clause shall be restored / rehabilitated to the satisfaction of the RE and ECO; and The removal, damage or disturbance of flora, fauna or avifauna is forbidden outside the immediate construction area without the written approval of the RE. 	Contractor, RE and/or ECO			
3.22	Cultural heritage	Protection of archaeological resources	<ul style="list-style-type: none"> The EO must be a person that is suitably trained to monitor and report on archaeological sites; 	Contractor	Daily, during construction	Approved MS for the management of archaeological and palaeontological resources.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> All staff on the site should be informed by the EO on the possible types of heritage sites and cultural material they may encounter and the procedures to follow when they find sites; The RE and ECO are to be kept informed of all developments in the event where modifications are made to the clearing or earthworks schedule; If an archaeological site / archaeological finds are discovered during any construction activity, the work is to be halted and the RE or ECO notified immediately; It is the responsibility of the EO to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in the affected area; The EO should inform the RE and the ECO of the archaeological find and its immediate impact on construction activities, and the ECO will in turn contact SAHRA, or the Free State Provincial Heritage (FSPH); If any unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit's, Thingahangwi Tshivase / Mimi Seetelo must be alerted immediately (via 012 320 8490) as per section 36 (6) of the NHRA; The Contractor will be required to abide by the specifications as set out in the Chance Finds Procedure / Protocol, or by any specifications from SAHRA or FSPH to investigate the find; Only after the site has been inspected will the Contractor be allowed to continue; and 			<p>Photographs.</p> <p>SAHRA / FSPH permits (if applicable).</p>	

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> The Contractor may not, without a permit issued by SAHRA, or the FSPH, destroy, damage, excavate, alter, deface, or otherwise disturb archaeological material. 				
		Protection of palaeontological resources	<ul style="list-style-type: none"> The Contractor shall undertake on-site monitoring for fossil material during excavation activities in accordance with fossil monitoring procedures. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place; Photographs of similar fossils must be provided to the Contractor by the RE, or ECO to assist in recognizing the fossil plants, vertebrates, or trace fossils in the shales and mudstone rocks of the site. Photographs of the fossil plants, vertebrates, or trace fossils are included in Appendix E of this EMPr; Photographs of putative fossils can be sent to a palaeontologist by the EO; If there is any possible fossil material encountered within the site, the ECO should contact a palaeontologist to inspect the selected material and check the dumps where feasible; Fossils plants or vertebrate material that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued, and housed in a suitable institution where they can be made available for further study. Annual reports must be submitted to SAHRA, or the FSPH as required by the relevant permits; 	Contractor, RE and/or ECO			

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> The Contractor will be required to follow the relevant fossil find procedures (see Appendix E), as determined by the nature of the find (e.g., isolated bone, bone cluster etc.) and any additional specifications prescribed by the palaeontologist; The palaeontologist shall obtain a permit from SAHRA or FSPH for the excavation of any fossils and compile a detailed report for submission to SAHRA or FSPH; and The Contractor shall prepare a Method Statement detailing the protocols for dealing with archaeological and palaeontological resources including, but not limited to, appointment of a heritage consultant and palaeontologist, permit application, sampling and collection, site protection, etc. 				
3.23	Fire control	Effective fire prevention and control	<ul style="list-style-type: none"> No open fires shall be allowed on site for the purpose of cooking or warmth. <i>Bona fide</i> braai fires (such braai fires shall be limited to the traditional “month end” braais and not individual daily cooking fires) may be lit within the construction camp; The Contractor shall take all reasonable steps to prevent the accidental occurrence or spread of fire; The Contractor shall ensure that all site personnel are aware of the procedure to be followed in the event of a fire; The Contractor shall ensure that there is basic fire-fighting equipment on site at all times. This equipment shall include fire extinguishers and beaters; 	Contractor	Daily, during construction	Approved fire contingency MS for fire prevention and control. Proof of consultation with local authorities. No signs of open fires. Fire-fighting team appointment and training records.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> The Contractor shall ensure that the telephone number of the local Fire and Emergency Service is displayed at the site offices; Smoking is not allowed on site, other than at designated smoking points. Cigarette butts shall not be discarded on the ground; and The Contractor shall join the Vaal Eden Fire Fighters Association to ensure compliance with the requirements of the Veld & Forest Fires Act, 1998 (No. 101 of 1998); and Prior to the commencement of construction activities, the Contractor is to ascertain the fire requirements of the local authorities and must submit a fire contingency plan Method Statement to the RE. 			Adequate fire-fighting equipment, especially at hot work areas. Shielded "hot work" areas. Displayed telephone numbers of the local Fire and Emergency Service. Clearly marked designated smoking points. No cigarette butts discarded on the ground.	
			<ul style="list-style-type: none"> The Contractor shall appoint a fire officer who shall be responsible for ensuring immediate and appropriate action in the event of a fire as well as maintenance of the fire-fighting equipment; and The appointed fire officer shall notify the Fezile Dabi District and Ngwathe Municipalities' Fire and Emergency Services in the event of a fire and shall not delay doing so until such time as the fire is beyond his / her control. 	Contractor and Fire Officer		Photographs.	
			<ul style="list-style-type: none"> The Contractor shall pay the costs incurred by organisations called to put out fires started by himself / herself, his / her staff, or any sub-contractor. The Contractor shall also pay the costs incurred to reinstate burnt areas as deemed necessary by the RE; and 	Contractor and RE			

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> Any work that requires the use of fire may only take place at that designated area and as approved by the RE. Fire-fighting equipment shall be available in these areas. 				
3.24	Air quality control	Dust generation is minimised	<ul style="list-style-type: none"> The Contractor shall ensure that the generation of dust is minimised and shall implement a dust control programme to maintain a safe working environment and minimise nuisance for the surrounding landowners and businesses; The Contractor shall ensure that exposed soil and material stockpiles are adequately protected against the wind (e.g., water spray vehicles, covering of material stockpiles, etc.); The location of stockpiles shall take into consideration the prevailing wind directions and locations of sensitive receptors; Construction vehicles shall comply with speed limits (speed limit for light vehicles is 40 km / hr and for heavy vehicles 20 km / hr) and haul distances shall be minimised. Material loads shall be suitably covered and secured during transportation; If required by the Ngwathe Local Municipality, additional dust control measures must be implemented to control dust generation; and The Contractor shall submit a Method Statement detailing the control of dust on site. 	Contractor	Daily, during construction	Approved MS for the control of dust. No excessive dust generation. Adequately protected exposed areas and material stockpiles. Procedure for recording and managing external grievance/complaints, and register. Photographs.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
3.25	Noise control and working hours	Noise disturbance to neighbouring properties is avoided or minimised	<ul style="list-style-type: none"> The Contractor shall be familiar with and adhere to, any local by-laws and regulations regarding the generation of noise and hours of operation. In addition, the provisions of SABS 1200A Sub clause 4.1 regarding "built-up areas" shall apply to all areas within audible distance of residents whether in urban, peri-urban, or rural areas; Construction activities should be limited to 08:00 and 17:00. This should be determined together with the local authorities; The Contractor shall negotiate for any permits requiring deviation from local by-laws and/or regulations with the Ngwathe Local Municipality. However, the Contractor shall advise the RE and ECO in writing of such intention prior to negotiating for these permits; The Contractor shall inform RE of any complaints received from the public or any other parties; and The Contractor shall be held responsible for any complaints received from the authority and/or public with respect to any contravention of the agreed conditions. 	Contractor	Ad hoc	<p>Procedure for recording and managing external grievance / complaints, and complaints register.</p> <p>Noise monitoring results (as required).</p> <p>Agreements with the Engineer and local authority (as required).</p>	<p>Site Inspections and Audits.</p> <p>Noise monitoring in accordance with SANS 10103 (when noise-related complaints have been received).</p>
3.26	Lights	Disturbance to road traffic and surrounding community is avoided or minimised	<ul style="list-style-type: none"> The Contractor should install light fixtures that provide precisely direct illumination to reduce light spillage beyond the immediate surrounds of the site, i.e., lights (specifically spotlights) are to be aimed away from the N1 and R59 roads and areas south and west of the site; The use of high pole top security lighting along the periphery of the site should be avoided. Only lights that are activated on illegal entry to the site should be used; and 	Contractor.	Ongoing	External Grievance/ Complaints procedure and register.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> The Contractor shall ensure that any lighting installed on the site for his/her activities does not interfere with road traffic or cause a reasonably avoidable disturbance to the surrounding users, specifically the surrounding Landowners. 				
3.27	General aesthetics	Disturbance to surrounding community is avoided or minimised	<ul style="list-style-type: none"> The Contractor shall take reasonable measures (e.g., visual screening using shade cloth in combination with fencing to screen the construction site, equipment, and materials) to ensure that construction activities do not have an unreasonable impact on the aesthetics of the area; All disturbed areas shall be re-vegetated, using local species, to minimise any visual scarring and reduce the aesthetic impact of the development; The Contractor should undertake the planting of screening vegetation along the eastern and northern boundaries of the site; and All outdoor advertising associated with this activity must comply with the applicable Local Authority By-law for the control of Outdoor Advertising or in the absence of local legislative controls, must comply with the South African Manual for Outdoor Advertising Control (SAMOAC). 	Contractor	Ongoing, during construction	External Grievance/ Complaints procedure and register.	Site Inspections and Audits. Local Authority By-Law for control of Outdoor Advertising / SAMOAC.
3.27	Access, traffic, and safety	Safe traffic management	<ul style="list-style-type: none"> The Contractor shall ensure that existing roads within and surrounding the site are maintained in a suitable condition; The Contractor shall ensure that all regulations relating to traffic management are observed; 	Contractor	Daily, during construction	Appropriate safety signage. Well-maintained access for landowners and other road.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> The Contractor shall also ensure that adequate traffic accommodation, signage and safety measures (as appropriate) are put in place on site; and Ensure that any tourism signage remains clear throughout the construction period and that it is replaced or relocated as appropriate at the end of the construction period to ensure minimal impact on tourism facilities. Placement of any relocated tourism signage must comply with the SAMOAC. 			Placement of tourism-related signage. Photographs.	Local Authority By-Law for control of Outdoor Advertising / SAMOAC.
3.28	Cement and concrete mixing	Contamination of the environment as a result of cement mixing is prevented	<ul style="list-style-type: none"> Cement and concrete mixing directly on the ground shall not be allowed and shall take place on impermeable surfaces to the satisfaction of the RE; Concrete mixing shall not take place within 32 m of any surface water sources, or areas of natural vegetation; The Contractor shall be responsible for the implementation of the necessary collection facilities in order to prevent cement-contaminated water run-off and / or settlement of suspended matter. Once settled, the clean water may be decanted off for re-use; At the end of the contract, any ponds used for contaminated water collection shall be dried out and the solids disposed of via the solid waste management system (see Section 3.7.2); 	Contractor	Daily, during construction	Suitable locations of batching plants. Appropriate containment and management of cement mixing. No cement bags lying around. No cement / concrete / aggregate patches after construction. Photographs.	Site Inspections and Audits.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> Unused cement bags shall be stored out of the rain where runoff would not affect them. Used (empty) cement bags shall be collected and stored in weatherproof containers to prevent wind-blown cement dust and water contamination; Used cement bags shall not be used for any other purpose and shall be disposed of on a regular basis via the solid waste management system (Section 3.7.2); All excess concrete shall be removed from site on completion of concrete works and disposed of at a licensed landfill site; Washing of the excess concrete into the ground shall be prohibited; and The Contractor shall submit a Method Statement detailing cement storage, concrete batching areas and methods, method of transport of cement and concrete, storage, and disposal of used cement bags, etc. for each concrete batching operation. 				
3.29	Emergency procedures	Safety and security for site personnel	<ul style="list-style-type: none"> The Contractor shall develop an Emergency Plan that will enable rapid and effective response to spills as well as to all other potential environmental emergencies; All abnormal and emergency incidences must be investigated and be reported to the relevant authorities in terms of Section 30 of the National Environmental Management Act, 1998 (Act 107 of 1998) as amended; The Contractor shall ensure that staff and the staff of Subcontractors are aware of the procedure to be followed for dealing with spills and leaks; 	Contractor	Ad Hoc	Approved Emergency Response Plan. Training records. Notification to DFFE (if applicable). Adequate fire-fighting equipment and warning signage.	Site Inspections and Audits

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> In the event of a major spill (more than 220 litres) DFFE shall be notified; The Contractor shall ensure that the necessary materials and equipment for dealing with spills and leaks are present on site at all times; The clean-up of spills and any damage caused by the spill or leak shall be for the Contractor's account. The 'polluter pays' principal shall be employed for any accidental spills and leaks; Treatment and remediation of spill areas shall be undertaken to the satisfaction of the RE and ECO; Spill cleaning materials shall be provided at each fuel and other liquid hazardous substance storage areas; Appropriate fire-fighting equipment shall also be provided at each storage area; and Emergency drills shall be conducted regularly in order to familiarise personnel with their roles and responsibilities in emergency response. 				
3.30	Site rehabilitation	Successful restoration of disturbed areas	<ul style="list-style-type: none"> On completion of the project, the Contractor shall ensure that all structures, equipment, materials, waste, rubble, notice boards and temporary fences used during the construction operation are removed with minimum damage to the surrounding area; The Contractor shall clean and clear the site to the satisfaction of the RE; 	Contractor	Ongoing	Approved MS for site rehabilitation No signs of excessive erosion. No alien invasive plant species at rehabilitation areas.	Site Inspections and Audits. Post construction audits and closure reports.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> The Contractor shall take all appropriate measures to prevent erosion, especially wind and water erosion, during the rehabilitation phase. Any erosion caused on site during the construction phase as a result of runoff shall be rehabilitated; Temporary erosion protection measures shall be kept in place until permanent preventative measures (such as establishment of vegetation) are concluded; and Any areas where natural vegetation on or around the site was disturbed shall be rehabilitated using plant material harvested during vegetation clearing (see Section 3.3.1), supplemented with material from adjacent natural areas, where necessary. 			Use of indigenous and locally endemic plant species for rehabilitation. Photographs.	
3.31	Alien vegetation control	Effective alien vegetation control	<ul style="list-style-type: none"> Alien vegetation management shall be undertaken on the site for the operational lifespan of the project; Any alien vegetation removal shall be undertaken by a suitably qualified sub-contractor; and No on-site burying, dumping, stockpiling, or burning of any weeds and alien plant species may occur. Such material shall be removed from the site and disposed of at a suitable municipal collection point or landfill site from where seed cannot escape. 	Contractor	Ongoing	Approved MS for alien vegetation control No alien invasive plant species at rehabilitation areas. Appointment of sub-contractor. No sign of on-site burying, dumping, stockpiling, or burning of alien vegetation. Photographs.	Site Inspections and Audits. Post construction audits and closure reports.

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
3.32	Socio-economic: Social project risks	Effective management of social risks and stakeholders	<ul style="list-style-type: none"> The Project Developer should develop a Social Impact Management Plan as soon as the project enters the public domain (outside of the EA process) and prior to construction. The Plan should be made available to the Contractor prior to construction. 	Project Developer	Prior to construction	Social Impact Management Plan is developed.	Site Inspections and Audits.
			<ul style="list-style-type: none"> The Contractor should appoint an appropriately qualified Community Liaison Officer (CLO) to deal with social aspects of the project throughout the life of the project; and The Contractor should develop a community relations strategy. The RE should approve the strategy. 	Contractor	Prior to construction	A CLO is appointed. A Community Relation Strategy is compiled.	N/A
3.33	Socio-economic: Employment and social environment	Local employment is maximised as far as possible	<ul style="list-style-type: none"> To ensure that previously disadvantaged individuals benefit from the proposed project during the construction phase, local Black Enterprise (BE) service providers and local labour from the surrounding towns should be employed as far as possible; Those successful in obtaining employment should be provided with the appropriate training; The Contractor should develop an induction programme that includes a Code of Conduct for all staff (including Subcontractors). The induction programme should include HIV / AIDS awareness programmes, education on tuberculosis, alcohol, and substance abuse; Any person employed on the project must sign the Code of Conduct and be presented with a copy; The Code of Conduct must include the following aspects; 	Contractor	Throughout construction	Procurement specifications in tender documents.	N/A

Ref #	Project activity/aspect	Environmental Outcome	Management Action	Responsibility	Timing	Records/Indicators	Monitoring Requirements
			<ul style="list-style-type: none"> ○ Respect for residents, their customs and property; ○ Respect for farm infrastructure and agricultural activities; ○ Prohibition of hunting and theft of livestock or products; ○ Zero tolerance for working under the influence of alcohol or any other illegal substance, i.e., dagga; and ○ A description of the disciplinary measures for the violation of the Code of Conduct. ● Stock theft should be considered as a dismissible offence; and ● Compensation for loss of land, structures and infrastructure associated with the development shall occur in a timely manner. 				
			<ul style="list-style-type: none"> ● The RE or Contractor shall take appropriate measures to ensure that the impacts on nearby business activities (e.g., dust, traffic, theft, etc.) as a result of the construction activities, are minimised. 	Contractor and RE			

APPENDIX A: ENVIRONMENTAL DO'S AND DON'TS

DO'S AND DON'T'S



Workers & equipment must stay inside the site boundaries at all times



Do not swim in or drink from streams
Do not throw oil, petrol, diesel, concrete or rubbish in the stream
Do not work in the stream without direct instruction
Do not damage the banks or vegetation of the stream



Protect animals on the site
Ask your supervisor or Contract's Manager to remove animals found on site



Do not damage or cut down any trees or plants without permission
Do not pick flowers



Put cigarette butts in a rubbish bin
Do not smoke near gas, paints or petrol
Do not light any fires without permission
Know the positions of fire fighting equipment
Report all fires
Do not burn rubbish/ vegetation without permission



Work with petrol, oil & diesel in marked areas
Report any petrol, oil & diesel leaks or spills
Use a drip tray under vehicles & machinery
Empty drip trays after rain & throw away where instructed



Try to avoid producing dust - wet dry ground & soil



Do not make loud noises around the site, especially near schools and homes
Report or repair noisy vehicles



Use the toilets provided
Report full or leaking toilets



Only eat in demarcated eating areas
Never eat near a river or stream
Put packaging & leftover food into rubbish bins



Do not litter - put all rubbish (especially cement bags) into the bins provided
Report full bins to your supervisor
The responsible person should empty bins regularly



Always keep to the speed limit
Drivers - check & report leaks
Ensure loads are secure & do not spill



Know all the emergency phone numbers



Spot fines of between R20 and R2000
Removal from site
Construction may be stopped



Report any breaks, floods, fires, leaks and injuries to your supervisor
Ask questions!

MOETS EN MOENIES



Werkers en gereedskap moet ten alle tye binne die terreingrense bly.



Moenie van strome drink of daarin swem nie.
Moenie olie, petrol, diesel, sement of rommel in strome gooi nie.
Moenie in strome werk sonder direkte instruksie nie.
Moenie stroomoewers en plantegroei beskadig nie.



Beskerm diere op die konstruksieterrein.
Vra u toesighouer of Kontrakbestuurder om diere van die terrein te verwyder.



Moenie enige plante of bome beskadig of afsny sonder toestemming nie.
Moenie blomme pluk nie.



Gooi sigaretstompies in 'n asblik.
Moenie rook naby gas, verf of petrol nie.
Moenie sonder toestemming enige vuur maak nie.
Weet waar brandbestrydingstoerusting gestoor word.
Meld alle vuur onmiddelik aan.
Moenie rommel verbrand sonder toestemming nie.



Werk slegs in gemerkte areas met petrol, olie & diesel.
Meld alle petrol, olie en diesel lekkasies aan.
Gebruik 'n drupbak onder voertuie en masjienerie.
Maak drupbakke leeg na reën, maar nie in riviere nie.



Probeer om nie stof te maak nie.
Maak droë grond nat met water.



Moenie harde geluide maak op die terrein nie, veral naby skole en huise.
Meld raserige voertuie aan of herstel dit.



Gebruik die toilette wat voorsien is.
Meld vol of lekkende toilette aan.



Eet slegs in gemerkte gebiede.
Moenie naby riviere of strome eet nie.
Gooi verpakking en orige kos in vullisblikke.



Moenie vullis rondstrooi nie - gooi alle vullis (veral sementsakke) in vullishouers.
Mel vol vullishouers aan by u toesighouer.
Vullishouers moet gereeld leeggemaak word.



Moet nooit die spoedperk oorskry nie.
Bestuurders - gaan voertuie na en meld lekkasies of rokerige voertuie aan.
Maak seker dat alle vragte stewig is en nie mors nie.



Maak seker dat u alle nood telefoonnommers ken.



Boetes tussen R20 en R2000
Verwydering vanaf die konstruksieterrein.
Konstruksie mag gestop word.



Meld alle brekasies, vuur, vloede, lekkasies en beserings aan by u toesighouer.
Vra vrae!

MOETS EN MOENIES



Werkers en gereedskap moet ten alle tye binne die terreingrense bly.



Moenie van strome drink of daarin swem nie.
Moenie olie, petrol, diesel, sement of rommel in strome gooi nie.
Moenie in strome werk sonder direkte instruksie nie.
Moenie stroomoewers en plantegroei beskadig nie.



Beskerms diere op die konstruksieterrein.
Vra u toesighouer of Kontrakbestuurder om diere van die terrein te verwyder.



Moenie enige plante of bome beskadig of afsny sonder toestemming nie.
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Maak seker dat alle vragte stewig is en nie mors nie.



Maak seker dat u alle nood telefoonnommers ken.



Boetes tussen R20 en R2000
Verwydering vanaf die konstruksieterrein.
Konstruksie mag gestop word.



Meld alle brekasies, vure, vloede, lekkasies en beserings aan by u toesighouer.
Vra vrae!

APPENDIX B: LIST OF FINES

SCHEDULE OF FINES FOR ENVIRONMENTAL DAMAGE OR CONSTRUCTION EMP TRANSGRESSIONS		
Note: The maximum fine for any environmental damage will never be less than the cost of applicable environmental rehabilitation.		
CEMP TRANSGRESSION OR RESULTANT ENVIRONMENTAL DAMAGE	MIN. FINE	MAX. FINE
Failure to report environmental damage or CEMP transgressions to the ECO or RE.	R 500	R 1 000
Failure to carry out instructions of the ECO or RE regarding the environment or the CEMP.	R 500	R 1 000
Failure to comply with prescriptions for supervision for loading and off-loading of delivery vehicles.	R 500	R 1 000
Failure to comply with prescriptions for securing of loads to ensure safe passage of delivery vehicles.	R 500	R 1 000
Failure to comply with prescriptions for the storage of imported materials within a designated contractor's yard.	R 500	R 1 000
Failure to comply with prescribed administration, storage or handling of hazardous substances.	R 500	R 1 000
Failure to comply with fuel storage, refuelling, or clean-up prescriptions.	R 500	R 1 000
Failure to comply with prescriptions for the use of ablution facilities.	R 500	R 1 000
Failure to comply with prescriptions for the use of designated eating areas, heating source for cooking or presence of fire extinguishers	R 500	R 1 000
Failure to comply with prescriptions regarding water provision	R 500	R 1 000
Failure to comply with prescriptions regarding fire control	R 500	R 5 000
Failure to comply with prescriptions for solid waste management (incl. paint chips, cement and concrete)	R 500	R 5 000
Failure to comply with prescriptions to prevent water pollution	R 500	R 1 000
Failure to comply with prescriptions regarding workshop equipment maintenance and storage	R 500	R 1 000
Failure to comply with prescriptions regarding noise levels of construction activities	R 500	R 5 000
Failure to comply with prescriptions regarding working hours	R 500	R 5 000
Failure to comply with prescriptions regarding lighting and aesthetics	R 500	R 1 000
Failure to comply with prescriptions regarding silt, debris and other obstruction removal	R 500	R 5 000
Failure to comply with prescriptions regarding water diversion and drainage	R 500	R 5 000
Failure to comply with prescriptions regarding erosion and scour protection	R 500	R 5 000
Failure to comply with prescriptions regarding traffic accommodation	R 500	R 5 000
Failure to comply with prescriptions regarding tree and vegetation removal / damage	R 5 000	R 20 000
Failure to comply with prescriptions regarding method statements	R 500	R 5 000
Failure to comply with prescriptions regarding environmental awareness training	R 500	R 5 000
Failure to comply with prescriptions regarding appointment of an Environmental Officer and monitoring of CEMP compliance	R 500	R 1 000
Failure to comply with prescriptions regarding site demarcation and erection of fences	R 500	R 5 000
Failure to comply with prescriptions regarding demarcation and enforcement of 'no go' areas	R 500	R 5 000
Failure to comply with prescriptions regarding control of vehicles and plant on access routes	R 500	R 1 000
Failure to comply with prescriptions regarding information posters	R 500	R 1 000
Failure to comply with prescriptions regarding procedures for emergencies	R 1 000	R 5 000

SCHEDULE OF FINES FOR ENVIRONMENTAL DAMAGE OR CONSTRUCTION EMP TRANSGRESSIONS

Note: The maximum fine for any environmental damage will never be less than the cost of applicable environmental rehabilitation.

Failure to comply with prescriptions posting of emergency numbers and contacting of the emergency call centre	R 500	R 5 000
Failure to comply with prescriptions regarding information boards or a complaints register	R 500	R 1 000
Failure to comply with prescriptions regarding protection of natural features	R 500	R 5 000
Failure to comply with prescriptions regarding erosion and sedimentation control	R 500	R 5 000

APPENDIX C: FOSSIL FINDS PROCEDURE

Monitoring Programme for Palaeontology – to commence once the excavations / drilling activities begin.

1. The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
2. When excavations begin the rocks and must be given a cursory inspection by the Environmental Control Officer (ECO) or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
3. Photographs of similar fossils must be provided to the developer and contractor to assist in recognizing the fossil plants, vertebrates, invertebrates or trace fossils in the shales and mudstones (for example see Figure 3-1 and Figure 3-2). This information will be built into the EMP's training and awareness plan and procedures.
4. Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
5. If there is any possible fossil material found by the developer/environmental control officer then a qualified palaeontologist to be sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.
6. Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued, and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
7. If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
8. If no fossils are found and the excavations have finished then no further monitoring is required.



Figure 3-2: Photographs of a selection of fossil plants from the *Glossopteris* flora from the Vryheid Formation (Ecca Group, Karoo Supergroup)



Figure 3-1: A surface view of a Stromatolite from the Malmani Subgroup

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