

Environmental Impact Assessment of the Used Fuel Transient Interim Storage Facility at Koeberg Nuclear Power Station

Environmental Management Programme

Report Prepared for



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Eskom

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Profile and Expertise of EAPs

SRK Consulting (South Africa) Pty Ltd (SRK) has been appointed by the Eskom to undertake the Environmental Impact Assessment (EIA) process required in terms of the National Environmental Management Act 107 of 1998 (NEMA).

SRK Consulting comprises over 1 300 professional staff worldwide, offering expertise in a wide range of environmental and engineering disciplines. SRK's Cape Town environmental department has a distinguished track record of managing large environmental and engineering projects, extending back to 1979. SRK has rigorous quality assurance standards and is ISO 9001 accredited.

As required by NEMA, the qualifications and experience of the key independent Environmental Assessment Practitioners (EAPs) undertaking the EIA are detailed below.

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Statement of SRK Independence

Neither SRK nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any pecuniary or other interest that could be reasonably regarded as being capable of affecting their independence or that of SRK.

SRK has no beneficial interest in the outcome of the assessment which is capable of affecting its independence.

Disclaimer

The opinions expressed in this report have been based on the information supplied to SRK by Eskom. SRK has exercised all due care in reviewing the supplied information, but conclusions from the review are reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features as they existed at the time of SRK's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which SRK had no prior knowledge nor had the opportunity to evaluate.

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Acronyms and Abbreviations

DEA	National Department of Environmental Affairs
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
GN	Government Notice
KNPS	Koeberg Nuclear Power Station
NEMA	National Environmental Management Act 107 of 1998
NNR	National Nuclear Regulator
SCC	Species of Conservation Concern
S&EIR	Scoping and Environmental Impact Reporting
SPA	Security Protected Area
SRK	SRK Consulting (South Africa) (Pty) Ltd
TISF	Transient Interim Storage Facility

Glossary

Activity	An activity or operation carried out as part of the construction or operation of the power plant
Aspect	An action, event, product or service, occurring as a component or result of an activity, which interacts with the existing environment (or which results in impacts to it)
Community	Those people who may be impacted upon by the construction and operation of the project. This includes neighbouring landowners, local communities and other occasional users of the area.
Contractor	Any company appointed by the Proponent to undertake construction or related activities on site, and will include the main Contractor, as well as any Sub-Contractors.
Construction Phase	The stage of project development comprising site preparation as well as all construction activities associated with the development.
Contaminated water	Water contaminated by activities on site, e.g. concrete water and run-off from plant / personnel wash areas.
Design Phase	The stage during which detailed layout and development plans are prepared, including the drafting of contract documents for construction.
Environment	The external circumstances, conditions and influences that surround and affect the existence and development of an individual, organism or group. These circumstances include biophysical, social, economic, historical and cultural aspects.
Environmental Authorisation	The authorisation by a competent authority of a listed activity or specified activity in terms of NEMA.
Environmental Impact Assessment	A process of evaluating the environmental and socio-economic consequences of a proposed course of action or project
Environmental Management Measures	Requirements or specifications for environmental management, as presented in the EMPr, some of which are based on the mitigation measures identified in the EIA Report (in this case the BAR).
Fuel assemblies	Bundles of fuel rods, containing nuclear fuel.
Hazardous substance	A substance (including materials and waste) that can have a deleterious (harmful) effect on the environment and those substances declared hazardous substances in terms of the Hazardous Substances Act 15 of 1973.
Impact	A change to the existing environment, either adverse or beneficial, that is directly or indirectly due to the development of the project and its associated activities.
Method Statement	A mandatory written submission by the Contractor to the ERP setting out the plant, materials, labour and method the Contractor proposes using to carry out an activity.
Mitigation Measures	Actions identified in the BAR to manage (avoid, minimise or optimise) potential environmental impacts which may result from the development.

Operations Phase	The stage of the works (including maintenance) following the Construction Phase, during which the development will function or be used as anticipated in the Environmental Authorisation.
Performance indicator	A measurable indicator of the outcome of environmental management, used to assess the success with which mitigation measures have been implemented. Often captures the results of several different monitoring activities.
Phase	A defined period during the life of the power plant project, e.g. the <i>construction</i> and <i>operations</i> phases.
Proponent	The person or organisation implementing the project.
Resources	The personnel, financial, equipment and technical requirements necessary for the successful completion of mitigation measures and for monitoring activities.
Schedule	The schedule or deadline for completion of each mitigation measure, which are recorded to ensure that mitigation measures are implemented in good time and in the correct sequence.
Security Protected Area	A restricted area surrounding the nuclear reactor units to which only authorised personnel have access. This is the area within the ACP 2 security fence. The SPA is distinct from the protected area status of the Koeberg Nature Reserve.
Solid waste	All solid waste including construction debris, chemical waste, broken / redundant equipment, oil filters, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).
Sub-Contractors	A Sub-Contractor is any individual or Contractor appointed by the main Contractor, to undertake a specific task on site.

1 Introduction

1.1 Background

Eskom proposes to construct a Transient Interim Storage Facility (TISF) for the temporary storage of dry casks at Koeberg Nuclear Power Station (KNPS) to accommodate used nuclear fuel from the reactors of the power station (now referred to as the “project”), thereby ensuring the continued operation of KNPS.

SRK Consulting (South Africa) (Pty) Ltd (SRK) undertook the Scoping and Environmental Impact Reporting (S&EIR) process required in terms of the National Environmental Management Act 107 of 1998, as amended (NEMA). The Environmental Impact Assessment (EIA) Report (SRK Report No.: 478317/06) contains a detailed description of the project and its impacts.

NEMA requires that an Environmental Management Programme (EMPr) be submitted along with the EIA Report to demonstrate how environmental management and mitigation measures will be implemented. The mitigation measures, which were identified during the S&EIR process, apply to the following phases of the development process:

- **The Design Phase:** These measures relate to the detailed layout, planning and design of the TISF, and will largely be implemented by the planning and development team, prior to the commencement of any physical on site activities. These mitigation measures are presented in Section 2.
- **The Construction Phase:** These mitigation measures are applicable during site preparation and construction on the site of the TISF and must be implemented by the relevant contractors and sub-contractors. These mitigation measures are presented in Section 3.
- **The Operational Phase:** These mitigation measures and monitoring requirements are applicable during the long-term operation and maintenance of the TISF and must be implemented by KNPS management. These mitigation measures are presented in Section 4 and the monitoring requirements are presented in Section 5.
- **The Decommissioning Phase:** The TISF will be decommissioned in accordance with the approved Koeberg Decommissioning Plan. Measures related to decommissioning of the TISF are not included in the EMPr.

The management measures listed for the various phases are either:

- **Essential:** best practice measures which must be implemented and are non-negotiable; or
- **Best Practice:** recommended to comply with best practice, with adoption dependent on the proponent’s risk profile and commitment to adhere to best practice, and which must be shown to have been considered and sound reasons provided by the proponent if not implemented. *These measures are highlighted in grey for ease of reference.*

Note: *The EMPr will be submitted to the National Department of Environmental Affairs (DEA) for approval along with the EIA Report. Once an Environmental Authorisation has been issued by DEA, this document may need to be updated to ensure that all relevant conditions of authorisation are adequately captured.*

1.2 Content of the EMPr

The EIA Regulations, 2014 (Government Notice (GN) 982), prescribe the required content in an EMPr. These requirements and the sections of this EMPr in which they are addressed, are summarised in Table 1-1.

Table 1-1: Content of the EMPr as prescribed by the EIA Regulations, 2014

GN 982 Ref.:	Item	Section Ref.:
(a) (i)	Details of the person who prepared the EMPr	Page i
(a) (ii)	Expertise of that person to prepare an EMPr	Page i
(b)	A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	1.3
(c)	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;	n/a
(d)	A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	
(d)(i)	Planning and design;	2
(d)(ii)	Pre-construction activities;	2
(d)(iii)	Construction activities	3
(d)(iv)	Rehabilitation of the environment after construction and where applicable post closure; and	3
(d)(v)	Where relevant, operation activities;	4
(e)	A description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	2 - 4
(f)	A description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to-	2 - 4
(f)(i)	Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	2 - 4
f(ii)	Comply with any prescribed environmental management standards or practices;	2 - 4
f(iii)	Comply with any applicable provisions of the Act regarding closure, where applicable; and	n/a
f(iv)	Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	n/a
(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	2 - 4
(h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	2 - 4
(i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	2 - 4
(j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	2 - 4
(k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f)	2 - 4
(l)	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	2 - 4
(m)	An environmental awareness plan describing the manner in which-	
(m)(i)	The applicant intends to inform his or her employees of any environmental risk which may result from their work; and	2 - 4
(m)(ii)	Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	2 - 4
(n)	Any specific information that may be required by the competent authority.	n/a

1.3 Site and Project Description

KNPS is located on a sandy coastline of the West Coast, approximately 27 km north of the Cape Town Central Business District and 1.5 km north of the residential area of Duynefontein. KNPS is situated on Cape Farm Duynefontyn No. 1552 (previously consisting of Farm Duynefontyn No. 34 and Farm No. 1375 which were consolidated by the City of Cape Town in 2015). Access to KNPS is via the R27 which runs along the property's eastern boundary or alternatively via Otto du Plessis Drive. Cape Farm Duynefontyn No. 1552 is owned by Eskom and measures approximately 1 294 ha and is zoned for *Risk Industry* and *Agricultural*.

The TISF will be located within the Security Protected Area (SPA) of KNPS, a flat area disturbed by previous construction activities and by current operational activities at KNPS.

The TISF will comprise concrete pad(s) within a site footprint of approximately 12 800 m² (1.28 ha). The TISF will be constructed to accommodate 160 dry storage casks for used nuclear fuel, though the dry storage casks will be placed on the pad in a modular manner.

The design of the concrete pad(s) of the TISF lends itself to various types of dry storage casking systems. The dry storage casks will be either metal or concrete casks or concrete assemblies and will be approximately 6 m in length and 3 m in width or diameter. Each cask can hold up to 37 fuel assemblies depending on the cask design. The TISF will also have an auxiliary building to house ancillary equipment.

A more detailed project description is provided in Section 3 of the EIA Report (SRK Report No.: 478317/06).

1.4 Potential Impacts

A summary of the potential impacts of the proposed development identified and assessed in the EIA Report is presented in Table 1-2. Additional details on the nature of these impacts are provided in the EIA Report.

Table 1-2: Potential impacts of the project

Impact	Description	Impact Status
Construction Phase		
Air Quality	Generation of dust	Negative
Noise	Nuisance to inhabitants of neighbouring residential community	Negative
Hydrology	Contamination of surface water	Negative
	Contamination of groundwater	Negative
Ecology	Loss of Vegetation, Floral Biodiversity and protected Species	Negative
	Loss of faunal habitat, faunal biodiversity and protected species	Negative
Socio- economic	Decline in quality of life caused by construction activities (visual, noise and traffic)	Negative
	Generation of employment, income and skills during construction	Positive
	Increased revenue to government and economic investment during construction	Positive
	Decrease in resource value from a loss of floral habitat and species	Negative
Traffic	Road safety concerns and delays to other road users as a result of construction traffic	Negative
Heritage	Loss or destruction of archaeological sites	Negative
Visual	Altered sense of place and visual intrusion caused by construction activities	Negative
Operational Phase		
Air Quality	Changes in air quality due to project related emissions	Negative
Noise	Increased noise during operations	Negative
Hydrology	Groundwater contamination due to project operations	Negative
Ecology	Loss of faunal habitat, faunal biodiversity and protected species	Negative
Socio- economic	Decline in quality of life from altered sense of place and visual intrusion	Negative
	Generation of employment, income and skills during operations	Positive
	Increased revenue to Government and economic investment during operations	Positive
Human health	Increased health risk due to radiation exposure	Negative
Traffic	Impacts of Operational Traffic	Negative
Visual	Altered sense of place and visual intrusion caused by the TISF	Negative

2 Measures Applicable to the Detailed Design Phase

2.1 Roles and Responsibilities

The key role players during the design phase of the project are:

- Eskom (the project proponent); and
- Engineering consultants responsible for the design of the TISF.

Their roles and responsibilities during the detailed design phase with respect to the implementation of the EMPr are outlined below.

Eskom:

- Ensure that the engineering consultant team is aware of and takes into consideration all relevant measures in the EMPr; and
- Confirm that all relevant environmental management measures in the EMPr have been incorporated into the project design on completion of the Design Phase.

Engineering Consultants:

- Take cognisance of all relevant measures in the EMPr and ensure integration thereof in the detailed design; and
- Reference the environmental management measures applicable to the construction (Section 3) and operational (Section 4) phases of the project in all documents that will be applicable to future phases of the project (e.g. tender documents).

2.2 Environmental Management Measures

The environmental management and mitigation measures that must be implemented during the design phase, as well as responsibilities and timelines for the implementation of these measures and monitoring thereof, are laid out in Table 2-1 below.

Table 2-1: Environmental management and mitigation measures that must be implemented during the *Design Phase*

Design Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods ¹	Performance Indicators
Authorisations	1.	Ensure that all required licences and permits have been obtained before the start of construction. These include, but may not be limited to: <ul style="list-style-type: none"> National Nuclear Regulator (NNR) approval. 	<ul style="list-style-type: none"> Eskom 	<ul style="list-style-type: none"> Before construction commences 	<ul style="list-style-type: none"> Keep record of all permits, licences and authorisations 	<ul style="list-style-type: none"> Required licences/permits on file
Environmental Compliance	2.	Appoint an independent/ suitably qualified ECO to oversee construction activities.	<ul style="list-style-type: none"> Eskom 	<ul style="list-style-type: none"> Before construction commences 	<ul style="list-style-type: none"> Review appointment documentation 	<ul style="list-style-type: none"> ECO appointment documents
	3.	Include the EMPr in all tender documents to ensure that sufficient resources are allocated to environmental management by the Contractor.	<ul style="list-style-type: none"> Eskom and Engineering consultants 	<ul style="list-style-type: none"> Prior to call for tenders 	<ul style="list-style-type: none"> Eskom to check tender documents and contract 	<ul style="list-style-type: none"> Incorporated in tender documents
Flora management	4.	Appoint a suitably qualified person to mark Species of Conservation Concern (SCC) and protected species within the area and appoint a suitably experienced person to oversee the removal, rescue and relocation of the SCC.	<ul style="list-style-type: none"> Eskom 	<ul style="list-style-type: none"> Before construction commences 	<ul style="list-style-type: none"> Appointment of vegetation specialist Search and Rescue Report 	<ul style="list-style-type: none"> Number of SCC relocated Permit on file
	5.	Undertake rescue and relocation of SCC prior to the commencement of construction related activities in consultation with a suitably qualified person and/or CapeNature.	<ul style="list-style-type: none"> Vegetation Specialist 			
	6.	Submit an application for a floral permit to CapeNature should SCC and protected species be removed from the construction footprint.				
Employment	7.	Prioritise the employment of local people.	<ul style="list-style-type: none"> Eskom 	<ul style="list-style-type: none"> Call for tenders 	<ul style="list-style-type: none"> Eskom to check tender documents and contract 	<ul style="list-style-type: none"> Incorporated in tender documents
	8.	Procure locally produced goods (plant and materials) and services, where possible.				
Waste management	9.	Develop a waste management plan, laying out: <ul style="list-style-type: none"> Expected type and amount of waste; Measures to reduce waste; Type and expected volume of recyclable waste; Recycling facilities that will collect / receive waste; Type of storage for different waste types; Waste contractors that will collect waste; 	<ul style="list-style-type: none"> Eskom and Engineering consultants 	<ul style="list-style-type: none"> During design phase 	<ul style="list-style-type: none"> Review of design documents 	<ul style="list-style-type: none"> Adequate provision for waste disposal
Stormwater management	10.	Implement the Stormwater Management Plan (Appendix B)	<ul style="list-style-type: none"> Engineering consultants 	<ul style="list-style-type: none"> During design phase 	<ul style="list-style-type: none"> Review detailed layout plans 	<ul style="list-style-type: none"> Approval of final design Incorporated in tender documents

¹ Unless otherwise indicated, monitoring will be undertaken by Eskom, supported by the authorities where the requirement is specifically stipulated in a licence or permit.

Design Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods ¹	Performance Indicators
Visual	11.	Reduce the footprint of the TISF and associated infrastructure to a workable minimum.	<ul style="list-style-type: none"> Engineering consultants 	<ul style="list-style-type: none"> During design phase 	<ul style="list-style-type: none"> Review detailed layout plans 	<ul style="list-style-type: none"> Compliance with measures
	12.	Be sensitive towards the use of glass or material with a high reflectivity which may cause glare and increase visual impacts.				
	13.	Limit lighting only to essential activities and facilities. Direct lighting inwards and downwards towards activities and facilities to avoid light spillage and trespass.				

3 Measures Applicable to the Construction Phase

3.1 Roles and Responsibilities

The key role players during the construction phase of the project are anticipated as follows:

- Eskom (the project proponent);
- Resident Engineer (RE), who will oversee the activities of the contractors on site;
- Contractors responsible for the construction of the TISF;
- Any Sub-contractors hired by the contractor; and
- ECO.

The anticipated construction phase organogram is presented in Figure 3-1 below and shows the proposed lines of communication during this phase. All instructions relating to the EMPr will be given to the contractor via the RE. In an emergency situation, the ECO may give an instruction directly to the Contractor/ Sub-contractors. Both the Contractor and ECO will report issues of concern to the RE, who in turn will report on progress to the proponent. The proponent will retain responsibility for ensuring that the Contractor fully implements the provisions of the EMPr.

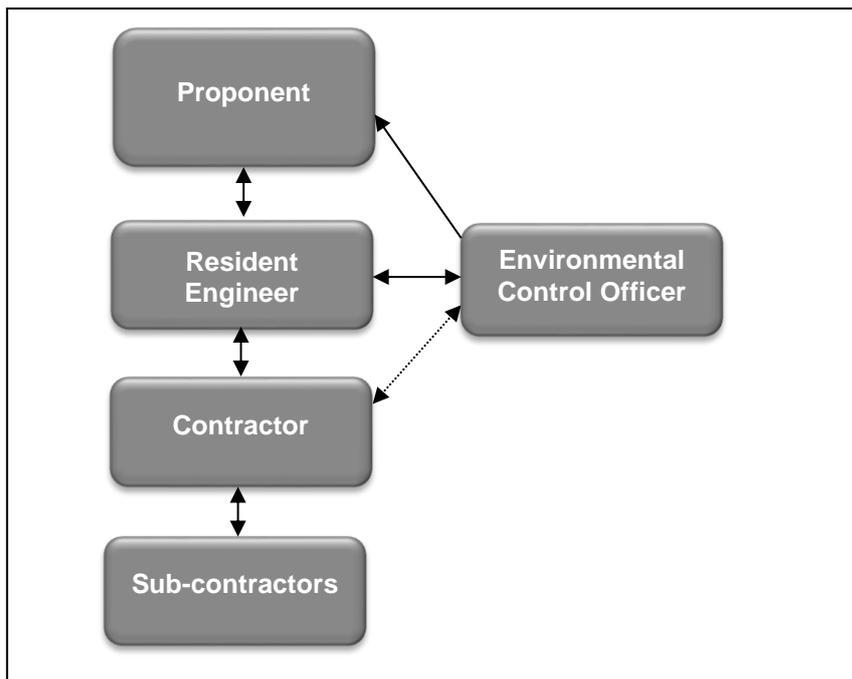


Figure 3-1: Construction Phase Reporting Structure

Key roles and responsibilities during the construction phase with respect to the implementation of the EMPr are outlined below.

Eskom:

Eskom has overall responsibility for management of the project. In terms of environmental management, the proponent will:

- Appoint suitably experienced Engineers who will be responsible for the overall management of activities on site during the Construction Phase;
- Appoint an independent and suitably qualified ECO to monitor compliance with the EMPr for the duration of the Construction Phase;
- Ensure that the Engineers are aware of the requirements of the EMPr, implement the EMPr and monitor the Contractor's activities on site;
- Ensure that the Contractor is aware of and contractually bound to the provisions of this EMPr by including the relevant environmental management requirements in the tender and contract documents, as appropriate;
- Ensure that the Contractor remedies environmental problems timeously and to the satisfaction of the ECO and authorities (when necessary); and
- Notify the authorities should problems not be remedied timeously.

Resident Engineer:

Eskom will appoint suitably qualified Engineers, who in turn will designate a suitable RE who will be responsible for overseeing activities of the Contractor during the Construction Phase. The RE shall:

- Ensure that the Contractor is duly informed of the EMPr and associated responsibilities and implications of this EMPr prior to commencement of construction;
- Monitor the Contractor's activities (together with the ECO) with regard to the requirements outlined in the EMPr;
- Relay all instructions from the ECO to the Contractor and ensure that these are fully understood and implemented;
- Report any environmental emergencies/concerns to the ECO immediately;
- Act as a point of contact for local residents and community members; and
- Ensure that non-compliance is remedied timeously and to the satisfaction of the relevant authorities.

Contractor:

The Contractor will be required to appoint or designate a Contractor's Environmental Representative (CR) who will assume responsibility for the Contractor's environmental management requirements on site and be the point of contact between the Contractor and the ECO. The CR shall:

- Ensure that all activities on site are undertaken in accordance with the EMPr;
- Monitor the Contractor's activities (together with the ECO) with regard to the requirements outlined in the EMPr;
- Ensure that all employees and sub-contractors comply with the EMPr;
- Immediately notify the ECO of any non-compliance with the EMPr, or any other issues of environmental concern; and
- Ensure that non-compliance is remedied timeously and to the satisfaction of the ECO.

The Contractor has a duty to demonstrate respect and care for the environment. The Contractor will be responsible for the cost of rehabilitation of any environmental damage that may result from non-compliance with the EMPr, environmental regulations and relevant legislation.

Sub-contractors:

All Sub-contractors will be required to:

- Ensure that all employees are duly informed of the EMPr and associated responsibilities and implications of this EMPr prior to commencement of construction;
- Ensure that all activities on site are undertaken in accordance with the EMPr;
- Monitor employees' activities (together with the ECO) with regard to the requirements outlined in the EMPr;
- Immediately notify the ECO of any non-compliance with the EMPr, or any other issues of environmental concern; and
- Ensure that non-compliance is remedied timeously and to the satisfaction of the ECO.

The Sub-contractor has a duty to demonstrate respect and care for the environment. The Sub-contractor will be responsible for the cost of rehabilitation of any environmental damage that may result from non-compliance with the EMPr, environmental regulations and relevant legislation, resulting from their presence on site.

Environmental Control Officer:

The ECO shall be a suitably qualified/experienced environmental professional or professional firm, appointed by the proponent, for the duration of the Construction Phase of the Project. The ECO shall:

- Request Method Statements from the Contractor prior to the start of relevant construction activities, where required, and approve these (as appropriate) without causing undue delay;
- Monitor, review and verify compliance with the EMPr by the main Contractor, as well as any sub-contractors and specialist contractors;
- Undertake site inspections at least once a month to determine compliance with the EMPr;
- Identify areas of non-compliance and recommend corrective actions (measures) to rectify them in consultation with Premier Fishing, the RE and the Contractor, as required;
- Compile a checklist highlighting areas of non-compliance following each ECO inspection;
- Ensure follow-up and resolution of all non-compliances;
- Provide feedback for continual improvement in environmental performance;
- Respond to changes in project implementation or unanticipated site activities which are not addressed in the EMPr, and which could potentially have environmental impacts, and advise Eskom, the RE and Contractor as required; and
- Undertake a site closure inspection, which may result in recommendations for additional clean-up and rehabilitation measures.

3.2 Compliance and Monitoring

3.2.1 Method Statements

A Method Statement is a document setting out specific details regarding the plant, materials, labour and method the Contractor proposes using to carry out certain activities, usually activities that may have a detrimental effect on the environment. It is submitted by the Contractor to the ECO.

The purpose of a Method Statement is for the Contractor to provide additional details regarding the proposed methodology for certain activities, and for the ECO to confirm that these meet the requirements of the EMPr and acceptable environmental practice. This allows the EMPr to be less prescriptive and affords the Contractor a certain amount of flexibility or to amend stipulations in the EMPr, if approved by the ECO. It also provides a reference point to detect deviations from the agreed approach to an activity.

Each Method Statement will address environmental management aspects relevant to the activity and will typically provide detailed descriptions of items including, but not necessarily limited to:

- Nature, timing and location of activities;
- Procedural requirements and steps;
- Management responsibilities;

- Material and equipment requirements;
- Transportation of equipment to and from site;
- Method for moving equipment/material while on site;
- How and where material will be stored;
- Emergency response approaches, particularly related to spill containment and clean-up;
- Response to compliance/non-conformance with the requirements of the EMPr; and
- Any other information deemed necessary by the ECO.

The following list provides examples of Method Statements that may be requested from the Contractor:

- Environmental awareness course preparation;
- Material and equipment storage and delivery;
- Fuel storage, dispensing and fuel spills;
- Waste management;
- Management of contaminated water;
- Erosion and stormwater control;
- Cement batching;
- Radiation protection; and
- Any others requested by the ECO.

The Method Statements will be submitted by the Contractor to the ECO not less than **7 days** prior to the intended date of commencement of an activity. The ECO shall approve / reject the Method Statement within **2 days**. An activity for which a Method Statement has been requested shall not commence until the ECO has approved of such method and once approved, the Contractor shall abide by the relevant Method Statement. A pro forma Method Statement is attached in Appendix A, although a suitable Method Statement format can be agreed between the ECO and Contractor.

3.2.2 Environmental Records and Reports

Environmental records and reports required during the Construction Phase are listed in Table 3-1.

Table 3-1: Reports required during Construction

Report	Frequency	From	To
Environmental Checklist	Weekly	CR	ECO
Environmental Compliance Report	Monthly	ECO	Eskom
Site Closure Audit	End of Contract	ECO	Eskom

Environmental Checklist

The CR will undertake weekly site inspections to check on the implementation of the EMPr by the Contractor and complete a brief report/checklist after the inspection. The completed checklists shall be submitted to the ECO at the end of each inspection. This checklist should be discussed between the CR and the ECO during the initial site inspection, and agreement reached on the preferred format and content.

Environmental Compliance Report

The ECO will prepare monthly Environmental Compliance Reports, detailing any environmental issues, non-compliance and actions to be implemented. These reports will be based on the ECO's

observations and the weekly Environmental Checklists. Environmental Compliance Reports will be submitted to Eskom and a full record will be kept by the ECO, for submission to the Local Authority and/or DEA on request.

When more frequent site visits are undertaken by the ECO, the frequency of progress reports will increase accordingly to allow for timeous reporting of environmental issues and actions required.

Photographic Records

If the ECO identifies any areas of concern, the ECO will request photographic records, which must be submitted by the Contractor for record purposes.

Construction Site Closure Audit

The ECO will undertake a final site closure audit on completion of the Construction Phase. The purpose of this is to confirm compliance with all site closure requirements identified by the ECO, and that the site has been left in an environmentally suitable condition. If outstanding environmental requirements are observed during this inspection, a further inspection must be carried out to confirm compliance. The Site Closure Audit Report will be submitted to Eskom for record purposes, and to the Local Authority and/or DEA if requested.

3.2.3 Corrective Action

Corrective action is a critical component of the implementation–review–corrective action–implementation cycle and it is through corrective action that continuous improvement can be achieved. Where repeated non-compliance is recorded, procedures may need to be altered accordingly to avoid the need for repeated corrective action.

If environmental compliance monitoring by the CR and ECO indicates non-conformance with the EMPr or approved Method Statements, the RE will formally notify the Contractor through a Corrective Action Request. The Corrective Action Request documents:

- The nature of the non-conformance/environmental damage;
- The actions or outcomes required to correct the situation; and
- The date by which each corrective or preventive action must be completed.

Upon receipt of the Corrective Action Request, the Contractor will be required to produce a Corrective Action Plan (or similar plan), which will detail how the required actions will be implemented. The Corrective Action Plan must be submitted to the ECO for approval prior to implementation. Once it has been approved, the corrective action must be carried out within the time limits stipulated in the Corrective Action Request. Additional monitoring by the CR and ECO will then be required to confirm the success or failure of the corrective action.

3.3 Environmental Management Measures

The environmental management and mitigation measures that must be implemented during the construction phase, as well as responsibilities and timelines for the implementation of these measures and monitoring thereof, are laid out in Table 3-2 below.

Table 3-2: Environmental management and mitigation measures that must be implemented during the Construction Phase

Construction Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods ²	Performance Indicators
Site camp	1.	Submit a method statement for Site Camp establishment for approval by the ECO at least two weeks prior to the start of construction activities.	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Start of construction 	<ul style="list-style-type: none"> Visual inspections Method statement 	<ul style="list-style-type: none"> Approved method statement Site boundaries demarcated Signage in place
	2.	Establish a suitably fenced Site Camp at the start of the contract, which will allow for site offices, vehicle, equipment, material and waste storage areas to be consolidated as much as possible. Locate the Site Camp at a position approved by the ECO. Provide water and / or washing facilities at the Site Camp for personnel.				
	3.	Demarcate construction site boundaries upon establishment. Control security and access to the site. Fence off site boundaries to the satisfaction of the ECO and ensure that plant, labour and materials remain within site boundaries.				
	4.	Designate the area beyond the boundary of the site as No go areas for all personnel on site. No vehicles, machinery, materials or people shall be permitted in the No go area at any time without the express permission of the RE in consultation with the ECO.				
Safety and Security	5.	Ensure that emergency procedures (in relation to fire, spills, contamination of the ground, accidents to employees, use of hazardous substances, etc.) are established prior to commencing construction.	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Throughout construction 	<ul style="list-style-type: none"> Visual inspection and approval by CR and ECO 	<ul style="list-style-type: none"> Number of safety/emergency incidents
	6.	Make all emergency procedures available, including responsible personnel, contact details of emergency services, etc. to all the relevant personnel. Clearly demarcate emergency procedures at the relevant locations around the site.				
	7.	Secure the Site Camp, particularly to restrict unauthorised access to fuels and any other hazardous substances.				
	8.	Store all construction material and equipment in locked containers within the Site Camp.				
	9.	Provide suitable emergency and safety signage on site, and demarcate any areas which may pose a safety risk (including hazardous substances, etc.).				
	10.	Advise the ECO of any emergencies on site, together with a record of action taken.				

² Unless otherwise indicated, monitoring will be undertaken by the ECO, supported by the authorities where the requirement is specifically stipulated in a licence or permit.

Construction Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods ²	Performance Indicators
Employment	11.	Prioritise the employment of local people.	• Eskom and Contractor	• Throughout construction	• Keep record of staff by origin • Keep record of training provided	• Percentage of local staff • Percentage of BEE staff
	12.	Procure locally produced goods (plant and materials) and services, where possible.				
	13.	Promote on-the-job training wherever possible.				
Environmental Awareness Training	14.	<p>Provide environmental awareness training to all personnel on site at the start of their employment. Training should include discussion of:</p> <ul style="list-style-type: none"> • Potential impact of construction waste and activities on the environment; • Suitable disposal of construction waste and litter; • Key measures in the EMPr relevant to worker's activities; and • How incidences and suggestions for improvement can be reported. <p>Ensure that all attendees remain for the duration of the training and on completion sign an attendance register that clearly indicates participants' names.</p>	• Contractor	<ul style="list-style-type: none"> • Before workers start working on-site • Before new activities are undertaken 	<ul style="list-style-type: none"> • Check training attendance register • Observe whether activities are executed in line with EMPr requirements 	<ul style="list-style-type: none"> • Proportion of workers that completed environmental training • Compliance of workers with EMPr
Hazardous materials	15.	Design and construct hazardous material storage facilities, especially fuel storage, with suitable impermeable materials and a minimum bund containment capacity equal to 110% of the largest container.	• Contractor	• Throughout construction	• Visual inspection of hazardous materials handling and storage areas	<ul style="list-style-type: none"> • Number of incidents of non-compliance with safety procedures concerning hazardous materials, including waste materials • Number of spills of hazardous materials, including waste materials • Cost of cleaning up spills • Evidence of contamination and leaks
	16.	Ensure that contaminants (including cement) are not placed directly on the ground (e.g. mix cement on plastic sheeting).				
	17.	Avoid unnecessary use and transport of hazardous substances.				
	18.	Compile a procedure for the storage, handling and transport of different hazardous materials and ensure that it is strictly adhered to.				
	19.	Keep Material Safety Data Sheets for all hazardous materials on site and ensure that they are available for reference by staff responsible for handling and storage of materials.				
Flora management	20.	Limit the footprint area of the construction activity to what is absolutely essential.	• Contractor	• Throughout construction	• Visual inspection	<ul style="list-style-type: none"> • Size of area cleared relative to construction footprint • Size of area disturbed outside of construction site boundary
	21.	Designate areas outside the construction footprint as No Go areas.				
	22.	Ensure that no vegetation is removed or disturbed outside the delineated construction site boundary.				

Construction Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods ²	Performance Indicators
	23.	Confine construction vehicles to designated roadways and strictly prohibit the indiscriminate movement of construction vehicles through vegetation falling outside of the construction / disturbance footprint.	• Contractor	• Throughout construction	• Visual inspection	• Number of alien plant species
	24.	Prohibit temporary storage of building material or soil within areas of natural vegetation falling outside of the construction footprint.				
	25.	Remove all alien and weed species encountered within areas disturbed by construction activities: <ul style="list-style-type: none"> • Where possible, remove alien species by hand; • Keep footprint areas as small as possible when removing alien plant species; and • Dispose of removed alien plant material at a licensed waste disposal facility. 				
Fauna Management	26.	Do not allow contractors or staff to harm, catch or kill birds or animals by any means, including poisoning, trapping, shooting or setting of snares.	• Contractor	• Throughout construction	• Visual Inspection	<ul style="list-style-type: none"> • Number of animals harmed • Time period trenches / excavations are left open • Number of incidents of animals found in trenches / excavations
	27.	Attempt, as far as possible to flush fauna within the construction footprint towards more suitable habitat within the surrounding areas. Clear vegetation towards the security fence line, thereby enabling any fauna to naturally relocate through the fence into the surrounding natural areas.				
	28.	Backfill trenches / excavations as soon as possible to ensure that the time the trench is exposed is kept to a minimum.				
	29.	Open trenches / excavations must be inspected on a daily basis for animals which may have fallen or become trapped.				
	30.	Safely remove and relocate any fauna that may be physically harmed by construction activities.				
Topsoil storage	31.	Limit construction and lay down areas to areas within the development footprint.	• Contractor	• Before construction commences	• Visual inspection	• Incidents of incorrect storage and harvesting of topsoil
	32.	Designate and demarcate areas to be used for topsoil stockpiling.				
	33.	Remove topsoil (up to a maximum of 30 cm depth).		• During vegetation clearing		
	34.	Stockpile topsoil prior to the commencement of construction activities (stockpile no higher than 2m) and conserve topsoil for rehabilitation.				
	35.	Locate topsoil stockpiles in an area protected from the wind, and agreed to with the ECO.				

Construction Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods ²	Performance Indicators
	36.	Replace harvested topsoil in areas that are to be rehabilitated as soon as sections of the works are completed (i.e. not only following the completion of all works)				
Concrete/Cement Work	37.	Use Ready-Mix concrete rather than batching where possible.	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Throughout construction 	<ul style="list-style-type: none"> Visual inspection and approval by RE and ECO 	<ul style="list-style-type: none"> Number of incidents of batching outside works footprint Contamination of water and soil Visible litter / waste on site
	38.	Ensure that no cement truck delivery chutes are cleaned on site. Cleaning operations are to take place off site at a location where wastewater can be disposed of in the correct manner. If this is not possible a suitable washing facility is to be developed on site in consultation with the ECO.				
	39.	Batch cement in a bunded area within the boundaries of the development footprint only (where unavoidable).				
	40.	Ensure that cement is mixed on mortar boards / plastic sheeting and not directly on the ground (where unavoidable).				
	41.	Physically remove any remains of concrete, either solid, or liquid, immediately and dispose of as waste.				
	42.	Place cement bags in bins and dispose of bags as waste to a licensed waste disposal facility.				
	43.	Sweep / rake / stack excess aggregate / stone chip / gravel / pavers into piles and dispose at a licensed waste disposal facility.				
Waste management	44.	Submit a Method Statement for waste management (including hazardous waste).	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Before start of activities on site Throughout construction 	<ul style="list-style-type: none"> Availability of Method Statement Visual inspection of waste collection and disposal areas Visual inspection of construction areas (litter) Check waste disposal slips 	<ul style="list-style-type: none"> Presence of litter Availability of rubbish bins and skips Degree to which rubbish bins and skips are filled Total volume of general and hazardous waste storage capacity Total volume of general and hazardous waste stored on site Degree to which different waste is separated Frequency of waste collection
	45.	Aim to minimise waste through reducing and re-using (packaging) material.				
	46.	Collect recyclables separately and deliver these to suitable facilities or arrange for collection.				
	47.	Collect all waste in bins and/or skips at the construction site.				
	48.	Prevent littering by construction staff at work sites by providing bins or waste bags in sufficient locations.				
	49.	Provide separate bins for hazardous / polluting materials and mark these clearly. Store hazardous / polluting materials on impermeable ground until it is disposed of / collected.				
	50.	Dispose of waste appropriately to prevent pollution of soil and groundwater.				

Construction Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods ²	Performance Indicators
	51.	Do not allow any burning or burying of waste on site.				
Contaminated Water/Run-off management	52.	Prevent discharge of any pollutants, such as cements, concrete, lime, chemicals, and other contaminated waste water and fuels into the environment.	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Throughout construction 	<ul style="list-style-type: none"> Visual inspection 	<ul style="list-style-type: none"> Implementation of preventative actions Visibility of water pollution
	53.	Direct run-off from fuel/workshop/equipment washing areas and concrete swills into conservancy tanks to be disposed of at a site approved by the ECO.				
	54.	Place drip trays / sand trays under engines of vehicles or mechanical equipment when parked or stored overnight or longer.				
	55.	Clean up any hydrocarbon spills immediately, through containment and removal of free product and dispose of contaminated material at a licensed waste disposal facility.				
Stormwater management	56.	Collect stormwater from bunded areas in a suitable container and remove from the site for appropriate disposal.	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Throughout construction 	<ul style="list-style-type: none"> Visual inspection 	<ul style="list-style-type: none"> Incidents of stormwater contamination Visible leaks/ water wastage Visible surface erosion
	57.	Use berms and stormwater drainage systems to prevent surface run-off from entering site excavations.				
	58.	Implement measures to maximise the infiltration of stormwater on site.				
	59.	Install temporary cut-off drainage channels to prevent stormwater runoff from entering the construction footprint.				
	60.	Implement the Stormwater Management Plan (Appendix B).				
Erosion management	61.	Ensure that all roads and tracks used for construction have the appropriate water diversion / erosion control structures.	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Throughout construction 	<ul style="list-style-type: none"> Visual inspection 	<ul style="list-style-type: none"> Visible surface erosion
	62.	Restrict construction to drier summer months, if possible, to avoid erosion of exposed soils and sedimentation of surrounding habitats.	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Throughout construction 	<ul style="list-style-type: none"> Visual inspection 	<ul style="list-style-type: none"> Visible surface erosion
Air quality management	63.	Avoid clearing of vegetation until absolutely necessary (i.e. just before earthworks).	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Throughout construction 	<ul style="list-style-type: none"> Visual assessment of dust plumes Visual assessment of dust control measures 	<ul style="list-style-type: none"> Visibility of dust coming off construction site Dust mitigation measures in place Number of days that dust plumes are visible Size of disturbed areas
	64.	Stabilise exposed surfaces as soon as is practically possible.				
	65.	Avoid excavation and handling and transport of materials which may generate dust under high wind conditions or when a visible dust plume is present.				

Construction Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods ²	Performance Indicators
	66.	Minimise dust generated off stockpiles: <ul style="list-style-type: none"> • Locate piles in sheltered areas where possible; • Place the stockpile lengthwise into the wind; • Minimise the slope of the stockpile (maximum slope of 2:1); • Limit stockpile sizes; • Install barriers on three sides of the stockpile (maximum 50% material porosity) if required; • Limit activity to the downwind side of the pile; • Use the last in – first out system of stockpile management; and • Cover stockpiles when not in active use for some time and / or use an environmentally friendly chemical spray to bind soil. 				
	67.	Reduce airborne dust at construction sites through: <ul style="list-style-type: none"> • Dampening dust-generating areas with freshwater; and • Covering dumps or stockpiles of loose material with plastic sheeting or netting, especially during windy conditions. 				
	68.	Limit vehicle speeds to 20 km/h on unconsolidated and non-vegetated areas.				
	69.	Cover trucks transporting loose material to or from site with tarpaulins, plastic or canvas.				
	70.	Ensure that any material spilled from trucks during transport to or from the site is cleaned up immediately.				
	71.	Use bedliners to minimise seepage and spillage of material from bottom-dumping trucks.				
	72.	Pre-water material to be moved, if possible.				
	73.	Check weather reports daily and closely observe weather patterns to enable action to be taken immediately if conditions change.				
	74.	Wash wheels of vehicles before vehicles exit the site to ensure that dust is not carried off-site. Use manual or automated sprayers and / or drive-through wheel washing bays.				
	75.	Limit the number of vehicles allowed on-site and restrict the movement of these vehicles over unsurfaced or unvegetated areas once they are on site to reduce dust problems.				

Construction Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods ²	Performance Indicators
	76.	Sweep roads leading from the site if wheel washing facilities do not effectively prevent mud being deposited on access roads.				
	77.	Sweep roads at site entrance and exit points regularly, to prevent the spread of mud / dust by construction vehicles.				
	78.	Maintain all generators, vehicles, vessels and other equipment in good working order to minimise exhaust fumes.				
	79.	Respond rapidly to complaints and take appropriate corrective action.				
Noise management	80.	Limit noisy construction activities to day-time from Monday to Saturday or in accordance with relevant municipal bylaws, if applicable.	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Throughout construction 	<ul style="list-style-type: none"> Random noise measurements 	<ul style="list-style-type: none"> Results of random noise measurements
	81.	Comply with the applicable municipal and / or industry noise regulations.				
	82.	Notify adjacent residents before particularly noisy construction activities will take place.				
	83.	Maintain all generators, vehicles, vessels and other equipment in good working order to minimise excess noise.				
	84.	Enclose diesel generators used for power supply on site to reduce unnecessary noise.				
	85.	Respond rapidly to complaints and take appropriate corrective action				
Fire management	86.	Ensure that no fires are permitted on or adjacent to the site.	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Throughout construction 	<ul style="list-style-type: none"> Inspect attendance register for training sessions Inspect fire extinguishers and certificates 	<ul style="list-style-type: none"> Number of fire incidents Certified extinguishers in appropriate locations
	87.	Ensure that no smoking is permitted on the site.				
	88.	Ensure that sufficient fire-fighting equipment is available on site.				
	89.	Equip all fuel stores and waste storage areas with fire extinguishers.				
	90.	Ensure that all personnel on site are aware of the location of firefighting equipment on the site and how the equipment is operated.				
	91.	Suitably maintain firefighting equipment.				
Transportation and refuelling	92.	Undertake regular maintenance of vehicles and machinery to identify and repair minor leaks and prevent equipment failures.	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Throughout construction 	<ul style="list-style-type: none"> Visual inspection of vehicles, machinery and 	<ul style="list-style-type: none"> Number of incidents of non-compliance

Construction Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods ²	Performance Indicators
	93.	Undertake any on-site refuelling and maintenance of vehicles/machinery in designated areas. Line these areas with an impermeable surface and install oil traps.			refuelling/maintenance areas	<ul style="list-style-type: none"> Number of leaks and spills Cost of cleaning up spills
	94.	Use appropriately sized drip trays for all refuelling and/or repairs done on machinery – ensure these are strategically placed to capture any spillage of fuel, oil, etc.				
	95.	Clean up any spills immediately, through containment and removal of free product and dispose of contaminated material at a licensed waste disposal facility.				
	96.	Keep spill containment and clean-up equipment at all work sites and for all polluting materials used at the site.				
Protection of archaeological and paleontological resources	97.	Empower staff to stop works on (chance) discovery of artefacts at the site.	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Before construction commences 	<ul style="list-style-type: none"> Visual inspection 	<ul style="list-style-type: none"> Number of incidents of damage caused to artefacts / remains.
	98.	Report the presence of graves or human remains, fragments of fossil bone, ostrich egg and stone fragments to Heritage Western Cape (HWC) or a suitably qualified archaeologist.		<ul style="list-style-type: none"> Throughout construction 		
	99.	Agree on suitable mitigation with HWC or the archaeologist.				
	100.	Obtain a permit for the removal of artefacts from the site if any are discovered during construction.				
Traffic Management	101.	Manage construction sites and activities so as to minimise impacts on road traffic as far as possible, e.g.: <ul style="list-style-type: none"> Attempt to arrange delivery of materials when it will least disrupt traffic; Stagger deliveries if possible rather than concentrating them during “rush” hours; and Keep construction materials and machinery at the construction site throughout the construction period, where possible. 	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Throughout construction 	<ul style="list-style-type: none"> Keep record of vehicles entering the site and time they enter Keep record of incidents and complaints Visually inspect vehicles for any obvious faults or overloading 	<ul style="list-style-type: none"> Number of incidents and complaints Number of vehicles travelling to site each day Condition of vehicles
	102.	Ensure that large construction vehicles are suitably marked to be visible to other road users and pedestrians.				
	103.	Ensure that all safety measures are observed and that drivers comply with the rules of the road.				
	104.	Ensure that vehicle axle loads do not exceed the technical design capacity of roads utilised by the project.				
	105.	Investigate and respond to complaints about traffic.				
Visual aspects	106.	Control litter and keep construction site as clean and neat as possible.	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Throughout construction 	<ul style="list-style-type: none"> Visual inspection 	<ul style="list-style-type: none"> Appearance of site Dust plumes

Construction Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods ²	Performance Indicators
	107.	Avoid excavation, handling and transport of materials which may generate dust under high wind conditions.				<ul style="list-style-type: none"> Number of complaints
	108.	Keep construction sites tidy and all activities, material and machinery contained within an area that is as small as possible.				
	109.	Minimise the use of night-lighting.				
Response to environmental pollution	110.	In the event of environmental pollution, e.g. through spillages, immediately stop the activity causing the problem.	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Throughout construction 	<ul style="list-style-type: none"> Maintain register of pollution events and responses Following resumption of activities, frequently inspect repaired equipment to ensure proper functioning 	<ul style="list-style-type: none"> Number of incidents Time activities stopped Number of recurring incidents Availability and completeness of register
	111.	Only resume activity once the problem has been stopped or (in the case of spillages) the pollutant can be captured.				
	112.	Repair faulty equipment as soon as possible.				
	113.	Install additional bunding / containment structures around the equipment that was the source of the leak / spillage to prevent further incidents.				
	114.	Treat hydrocarbon spills, e.g. during refuelling, with adequate absorbent material, which then needs to be disposed of at a suitable landfill.				
	115.	Ensure vehicles and equipment are in good working order and drivers and operators are trained with respect to actions to be taken in the case of a spill or leak.				
Site rehabilitation and closure	116.	Remove all construction equipment, vehicles, equipment, waste and surplus materials, including site offices, temporary fencing and other facilities, from the site.	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> Once construction is complete; or Throughout construction if it takes place in phases / different areas sequentially 	<ul style="list-style-type: none"> Visual inspection of site Appointment of rehabilitation specialist Keep record of rehabilitation measures 	<ul style="list-style-type: none"> Rehabilitation forms an integral part of operations from start-up Construction sites fully rehabilitated within five years
	117.	Clean up and remove any spills and contaminated soil in the appropriate manner.				
	118.	Ensure that no discarded materials are buried on site or on any other land not designated for this purpose.				
	119.	Ensure that affected areas are rehabilitated following construction.				
	120.	Rehabilitate areas adjacent to the site (if disturbance is unavoidable) to at least the same condition as was present prior to construction.				
	121.	Use harvested topsoil for rehabilitation following construction.				
	122.	Appoint a suitably qualified professional to undertake or supervise rehabilitation.				

Construction Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods ²	Performance Indicators
	123.	Rehabilitate all project areas as soon as possible after completion of activities in each area, including removing and/or remediating any contaminated soils.				
	124.	Replace harvested topsoil in areas that are to be rehabilitated as soon as sections of the works are completed (i.e. not only following the completion of all works).				

4 Measures Applicable to the Operational Phase

4.1 Roles and Responsibilities

The key role players during the operation phase of the project are:

- Eskom (the proponent);
- Environmental Manager; and
- Contractors responsible for maintenance activities.

Key roles and responsibilities during the operational phase with respect to the implementation of the EMPr are outlined below.

Eskom:

- Ensure that all managers are aware of the requirements of the EMPr;
- Ensure that copies of the EMPr are available on site;
- Review monthly audit reports on environmental performance of operations;
- Implement and manage a programme of environmental inspection, monitoring and reporting;
- Implement a programme for follow-up and analysis of all environmental incidents or accidents; and
- Liaise with the authorities and other stakeholders regarding environmental performance.

Facility Manager (Eskom):

- Comply with the applicable environmental commitments, procedures, restrictions and guidance specified in the EMPr;
- Ensure that all supervisors and workers are familiar with and understand the requirements of the EMPr that are relevant to their activities;
- Ensure that all supervisors regularly discuss environmental topics with staff;
- Conduct environmental inspections, monitoring and reporting, as stipulated by Eskom and in line with the EMPr;
- Ensure that all environmental incidents or accidents are investigated and analysed, and that measures are implemented to prevent similar events from happening in the future;
- Review the environmental performance of contractors; and
- Compile quarterly audit reports on environmental performance.

Contractors:

- Comply with the applicable environmental commitments, procedures, restrictions and guidance specified in the EMPr;
- Co-operate fully in implementing applicable environmental procedures;
- Ensure that copies of the EMPr are available on site;
- Ensure that all personnel on site, (including any sub-contractors and their staff) are familiar with and understand the requirements of the EMPr relevant to their activities; and
- Ensure that any problems and non-conformances are remedied in a timely manner, to the satisfaction of the relevant management personnel at Eskom.

4.2 Compliance and Monitoring: Maintenance Activities

If a Contractor is appointed to undertake maintenance, a Method Statement may be requested from the Contractor. The Method Statement will be submitted by the Contractor to the Environmental Manager not less than **7 days** prior to the intended date of commencement of maintenance. The Environmental Manager shall approve / reject the Method Statement within **2 days**. An activity covered by a Method Statement shall not commence until the Facility Manager has approved of such method and once approved, the Contractor shall abide by the relevant Method Statement. A pro forma Method Statement is attached in Appendix A, although a suitable Method Statement format can be agreed between the Environmental Manager and Contractor.

4.3 Environmental Management Measures

The environmental management and mitigation measures that must be implemented during the operational phase, as well as responsibilities and timelines for the implementation of these measures and monitoring thereof, are laid out in Table 4-1 below.

Table 4-1: Environmental management and mitigation measures that must be implemented during the Operational Phase

Operational Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods ³	Performance Indicators
Air quality management	1.	Maintain all generators, vehicles, vessels and other equipment in good working order to minimise exhaust fumes.	<ul style="list-style-type: none"> Environmental Manager 	<ul style="list-style-type: none"> Throughout operations 	<ul style="list-style-type: none"> Regular audits 	<ul style="list-style-type: none"> Number of incidents and complaints Response time to complaint
	2.	Respond rapidly to complaints and take appropriate corrective action.	<ul style="list-style-type: none"> Eskom 			
Noise management	3.	Comply with the applicable municipal and / or industry noise regulations.	<ul style="list-style-type: none"> Environmental Manager 	<ul style="list-style-type: none"> Throughout operations 	<ul style="list-style-type: none"> Regular audits 	<ul style="list-style-type: none"> Number of incidents and complaints Response time to complaint
	4.	Maintain all generators, vehicles, vessels and other equipment in good working order to minimise excess noise.				
	5.	Respond rapidly to complaints and take appropriate corrective action.	<ul style="list-style-type: none"> Eskom 			
Contaminated Water/Run-off management	6.	Prevent discharge of any pollutants, such as cements, concrete, lime, chemicals, and other contaminated waste water and fuels into the environment.	<ul style="list-style-type: none"> Environmental Manager 	<ul style="list-style-type: none"> Throughout operations 	<ul style="list-style-type: none"> Regular audits 	<ul style="list-style-type: none"> Implementation of preventative actions Visibility of water pollution
	7.	Place drip trays / sand trays under engines of vehicles or mechanical equipment when parked or stored overnight or longer.				
	8.	Clean up any hydrocarbon spills immediately, through containment and removal of free product and dispose of contaminated material at a licensed waste disposal facility.				
Transporting and Transferring	9.	Ensure vehicles and equipment are in good working order and drivers and operators are trained.	<ul style="list-style-type: none"> Eskom 	<ul style="list-style-type: none"> Throughout operations 	<ul style="list-style-type: none"> Visual inspection 	<ul style="list-style-type: none"> Number of leaks and spills Number of incidents of non-compliance
	10.	Restrict vehicles to designated roadways.				
	11.	Obtain the required abnormal load permits for the transport of casks to the site.	<ul style="list-style-type: none"> Eskom 	<ul style="list-style-type: none"> Prior to transport of casks 	<ul style="list-style-type: none"> Audit 	<ul style="list-style-type: none"> Permits on file
Flora management	12.	Remove all alien and weed species in areas surrounding the facility: <ul style="list-style-type: none"> Where possible, remove alien species by hand; Keep footprint areas as small as possible when removing alien plant species; and Dispose of removed alien plant material at a licensed waste disposal facility. 	<ul style="list-style-type: none"> Environmental Manager 	<ul style="list-style-type: none"> Throughout operations 	<ul style="list-style-type: none"> Visual inspection 	<ul style="list-style-type: none"> Number of alien plant species
Waste management	13.	Aim to minimise waste through reducing and re-using (e.g. packaging) material.	<ul style="list-style-type: none"> Environmental Manager 	<ul style="list-style-type: none"> Throughout operations 	<ul style="list-style-type: none"> Regular audits against waste management plan 	<ul style="list-style-type: none"> Presence of litter Availability of rubbish bins and skips
	14.	Collect recyclables separately and deliver these to suitable facilities or arrange for collection.				

³ Unless otherwise indicated, monitoring will be undertaken by the Eskom Environmental Officer, supported by the authorities where the requirement is specifically stipulated in a licence or permit.

Operational Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods ³	Performance Indicators
	15.	Collect all waste in bins and/or skips. Prevent littering by staff at work sites by providing bins or waste bags in sufficient locations.				<ul style="list-style-type: none"> Degree to which rubbish bins and skips are filled Total volume of general and hazardous waste storage capacity Total volume of general and hazardous waste stored on site Degree to which different waste is separated Frequency of waste collection
	16.	Provide separate bins for hazardous / polluting materials and mark these clearly.				
	17.	Store hazardous / polluting materials on impermeable ground until it is disposed of / collected.				
	18.	Dispose of waste appropriately to prevent pollution of soil and groundwater.				
	19.	Do not allow any burning or burying of waste on site.				
Ablutions	20.	Use existing ablation facilities and waste water treatment facilities at KNPS.	<ul style="list-style-type: none"> Environmental Manager 	<ul style="list-style-type: none"> Throughout operations 	<ul style="list-style-type: none"> Visual inspection 	<ul style="list-style-type: none"> Number of incidents of staff not using facilities
Response to environmental pollution	21.	In the event of environmental pollution, e.g. through spillages, immediately stop the activity causing the problem.	<ul style="list-style-type: none"> Environmental Manager 	<ul style="list-style-type: none"> Throughout operations 	<ul style="list-style-type: none"> Maintain register of pollution events and response Following resumption of activities, frequently inspect repaired equipment to ensure proper functioning 	<ul style="list-style-type: none"> Number of incidents Time activities stopped Number of recurring incidents Availability and completeness of register
	22.	Only resume activity once the problem has been stopped or (in the case of spillages) the pollutant can be captured.				
	23.	Clean up any hydrocarbon spills immediately, through containment and removal of free product and dispose of contaminated material at a licensed waste disposal facility.				
	24.	Repair faulty equipment as soon as possible.				
	25.	Install additional bunding / containment structures around the equipment that was the source of the leak / spillage to prevent further incidents.				
	26.	Ensure vehicles and equipment are in good working order and drivers and operators are trained with respect to actions to be taken in the case of a spill or leak.				
	27.	In the case of suspected emissions, return cask to fuel building for evaluation and repair and decontaminate cask storage pad.				
	28.	Immediately report all radiation spills / leaks to the Local Authority, NNR and DEA.	<ul style="list-style-type: none"> Eskom 	<ul style="list-style-type: none"> Throughout operations 	<ul style="list-style-type: none"> Incident report 	<ul style="list-style-type: none"> Communication with authorities
Socio-economic	29.	Favour local procurement.	<ul style="list-style-type: none"> Eskom 	<ul style="list-style-type: none"> Throughout operations 	<ul style="list-style-type: none"> Review procurement documentation 	<ul style="list-style-type: none"> Number of locally produced casks
Visual	30.	Ensure infrastructure is well maintained and neat.	<ul style="list-style-type: none"> Environmental Manager 	<ul style="list-style-type: none"> Throughout operations 	<ul style="list-style-type: none"> Visual inspection 	<ul style="list-style-type: none"> Appearance of TISF site
	31.	Keep all areas neat, clean and organised in order to portray a general tidy appearance.				

Operational Phase Measures						
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods ³	Performance Indicators
	32.	Limit lighting only to essential activities and facilities. Direct lighting inwards and downwards towards activities and facilities to avoid light spillage and trespass.				
Stormwater management	33.	Implement the Stormwater Management Plan (Appendix B).	<ul style="list-style-type: none"> Environmental Manager 	<ul style="list-style-type: none"> Throughout operations 	<ul style="list-style-type: none"> Regular audits against Stormwater Management Plan 	<ul style="list-style-type: none"> No non-conformances
Monitoring	34.	Implement a monitoring system to monitor for radioactive emissions. Refer to Section 5.	<ul style="list-style-type: none"> Eskom 	<ul style="list-style-type: none"> Prior to operations 	<ul style="list-style-type: none"> Data from monitoring system 	<ul style="list-style-type: none"> Monitoring system in place Monitoring report

5 Monitoring

5.1 Radiological Monitoring

Eskom has an existing Environmental Monitoring Programme in place which includes radiation control and monitoring measures in and around KNPS. The Programme must be amended to include radiation control and monitoring measures at the TISF. Refer to Table 5-1.

Table 5-1: Radiation monitoring measures

Monitoring Phase Measures																										
Aspect	ID	Mitigation measure / Procedure	Responsible	Implementation Timeframe	Monitoring Methods	Performance Indicators																				
Worker Dose Monitoring	1.	Set and verify the radiation dose rate along the TISF security fence to less than 0.0005 mSv/h.	• Eskom	• Prior to operations	<ul style="list-style-type: none"> • Keep records of measurement times and results • Review reports for adequacy of monitoring and results • Personnel dose records 	<ul style="list-style-type: none"> • Regular sampling, no gaps • Regular reporting 																				
	2.	Ensure all person entering the TISF site wear radiation monitoring devices.		• Throughout operations			TISF Dose Rate Area Monitoring	3.	Install radiation monitoring equipment at the TISF site. The monitoring equipment must include detectors with continuous monitoring and alarm capability if pre-determined thresholds are exceeded.	• Eskom	• Prior to and throughout operations	<ul style="list-style-type: none"> • Keep records of measurement times and results • Review reports for adequacy of monitoring and results 	<ul style="list-style-type: none"> • Regular sampling, no gaps • Regular reporting 	4.	Undertake manual monitoring to confirm the dose rates from the permanent monitoring equipment.	• Routine basis	TISF Contamination Monitoring	5.	Undertake periodic radiological monitoring of stormwater.	• Eskom	• Monthly when stormwater available	<ul style="list-style-type: none"> • Keep records of measurement times and results • Review reports for adequacy of monitoring and results 	<ul style="list-style-type: none"> • Regular sampling, no gaps • Regular reporting 	Public Dose Monitoring	6.	Incorporate the TISF site into the existing public boundary dose monitoring programme at KNPS.
TISF Dose Rate Area Monitoring	3.	Install radiation monitoring equipment at the TISF site. The monitoring equipment must include detectors with continuous monitoring and alarm capability if pre-determined thresholds are exceeded.	• Eskom	• Prior to and throughout operations	<ul style="list-style-type: none"> • Keep records of measurement times and results • Review reports for adequacy of monitoring and results 	<ul style="list-style-type: none"> • Regular sampling, no gaps • Regular reporting 																				
	4.	Undertake manual monitoring to confirm the dose rates from the permanent monitoring equipment.		• Routine basis			TISF Contamination Monitoring	5.	Undertake periodic radiological monitoring of stormwater.	• Eskom	• Monthly when stormwater available	<ul style="list-style-type: none"> • Keep records of measurement times and results • Review reports for adequacy of monitoring and results 	<ul style="list-style-type: none"> • Regular sampling, no gaps • Regular reporting 	Public Dose Monitoring	6.	Incorporate the TISF site into the existing public boundary dose monitoring programme at KNPS.	• Eskom	• Prior to operations	• Audit of monitoring programme	• TISF incorporated in monitoring programme						
TISF Contamination Monitoring	5.	Undertake periodic radiological monitoring of stormwater.	• Eskom	• Monthly when stormwater available	<ul style="list-style-type: none"> • Keep records of measurement times and results • Review reports for adequacy of monitoring and results 	<ul style="list-style-type: none"> • Regular sampling, no gaps • Regular reporting 																				
Public Dose Monitoring	6.	Incorporate the TISF site into the existing public boundary dose monitoring programme at KNPS.	• Eskom	• Prior to operations	• Audit of monitoring programme	• TISF incorporated in monitoring programme																				

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Sharon Jones

Principal Environmental Consultant

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Chris Dalgliesh

Partner

Appendix A:

Method Statement Pro Forma

METHOD STATEMENT PRO FORMA

CONTRACT:.....

DATE:.....

PROPOSED ACTIVITY (give title of method statement):

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

--

START AND END DATE OF WORKS FOR WHICH METHOD STATEMENT IS REQUIRED:

Start Date:

End Date:

--

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated maps and plans where possible):

Note: please attach extra pages if more space is required

Appendix B:
Conceptual Stormwater Management Plan
(Refer to Appendix F of the EIA Report)

Appendix C:

Declaration by Parties

[Proponent]

I, _____, representing [Proponent], record as follows:

I/we have read and understood this Environmental Management Programme.

I am aware of [Proponent's] responsibilities in terms of complying with, enforcing and implementing the provisions of the Environmental Management Programme and all of its constituent documents.

I undertake to comply with those requirements of the applicable environmental laws, approvals and obligations arising out of the Environmental Management Programme in the discharging of my obligations.

Signed: _____ Name: _____

Position: _____ Date: _____

[Contractor]

I/we, _____ record as follows:

I/ we, the undersigned, do hereby declare that I/ we am/ are aware of the requirement by [Proponent] that construction activities will be carried out with due regard to their impact on the environment.

In view of this requirement, I/ we will, in addition to complying with the letter of the terms of the Contract dealing with protection of the environment, also take into consideration the spirit of such requirements and will, in selecting appropriate sub-contractors, employees, plant, materials and methods of construction, in-so-far as I/ we have the choice, include in the analysis not only the technical and economic (both financial and with regard to time) aspects but also the impact on the environment of the options. In this regard, I/ we recognise and accept the need to abide by the "precautionary principle" which aims to ensure the protection of the environment by the adoption of the most environmentally sensitive construction approach in the face of uncertainty with regard to the environmental implications of construction.

I/we have signed the Declaration of Understanding with respect to the Environmental Management Programme.

Signed: _____ Date: _____

[Contractor]

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