

**2017**

**DRAFT ENVIRONMENTAL MANAGEMENT  
PROGRAMME FOR THE PROPOSED EXPANSION OF A  
RAILWAY LOOP AT FERROGATE WITHIN THE  
JURISDICTION OF THE THABAZIMBI LOCAL  
MUNICIPALITY IN LIMPOPO PROVINCE**


**JULY 2017**



DOCUMENT CONTROL

**DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME FOR THE PROPOSED EXPANSION OF RAILWAY LOOP AT FERROGATE STATION, LIMPOPO PROVINCE**

**Quality Control**

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## ACRONYMS

APA	Agricultural Pests Act, 1983 (Act No. 36 of 1983)
APA	Animals Protection Act, 1962 (Act No. 71 of 1962)
APPA	Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965)
BDA	Biodiversity Act, 2004 (Act No. 10 of 2004)
CARA	Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983)
CECO	Contractor Environmental Control Officer
DAFF	Department of Agriculture, Fisheries and Forestry
DEA	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EA	Environmental Authorisation
ECA	Environment Conservation Act, 1989 (Act No. 73 of 1989)
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
FA	Fencing Act, 1963 (Act No. 31 of 1963)
HSA	Hazardous Substance Act, 1973 (Act 15 of 1973)
HIA	Heritage Impact Assessment
KM	Kilometres
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
NEMWA	National Environmental Management Waste Act, 2008 (Act 36 of 2008)
NEMAQA	National Environmental Air Quality Act, 2004 (Act 39 of 2004)
NEMBA	National Environmental Management Biodiversity Act, 2004 (Act 10 of 2004)
NHRA	National Heritage Resources Act, 1999 (Act 25 of 1999)
NLTA	National Land Transport Act, 2009 (Act 5 of 2009)
NVFF	National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998)
NWA	National Water Act, 1998 (Act 36 of 1998)
OHSA	Occupational Health and Safety Act, 1993 (Act of 85 of 1993)

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SACNASP	South African Council of Natural Scientist Profession
SAHRA	South African Heritage Resources Agency
SES	Standard Environmental Specification
TLB	Tractor Loader Backhoe
WULA	Water Use Licence Application

## 1 INTRODUCTION

The construction of a railway loop can have a major impact on the environment. It is therefore imperative that precautions are taken to ensure that environmental degradation is minimized while the project is undertaken. This will take a concerted effort from the project team and proper planning is of the utmost importance.

Nsovo Environmental Consulting (hereafter referred to as Nsovo) has been appointed by Transnet SOC Limited (hereafter referred to as Transnet) to compile an Environmental Management Programme (EMPr) which will be a guideline for the mitigation and management measures to be implemented during the course of the project as well as during the operational phase. This EMPr is a living document that guides the day to day activities throughout the lifecycle of the project; it may from time to time, require revisions as may be dictated by the course of construction.

The purpose of the EMPr is to give effect to precautionary measures, which are to be put in place for controlling the activities that take place on site. It has been developed to ensure compliance with National legislative and regulatory requirements.

## 2 DETAILS AND EXPERTISE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Nsovo is conversant with the definition and general requirements of an Environmental Assessment Practitioner (EAP) as defined in Section 1 of the National Environmental Management Act, 1998 (No 107 of 1998) (NEMA) and Regulation 13 of the Environmental Impact Assessment Regulations promulgated in December 2014 as amended. Nsovo is:

- Independent and objective;
- Has expertise in conducting Environmental Impact Assessments (EIA);
- Takes into account all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority. ---

Table 1: **Details of the EAP**

Name of Company	Nsovo Environmental Consulting
Person Responsible	Munyadziwa Rikhotso
Professional Registration	Registered with the South African Council for Natural Scientific Professions (SACNASP).
Postal Address	Postnet Suite 697 Private Bag X29 Gallo Manor



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Telephone Number	011 0413689
Fax Number	086 602 8821
Email	<a href="mailto:munyadzi@nsovo.co.za">munyadzi@nsovo.co.za</a>
Qualifications & Experience	B.Sc. Honours Geography and Environmental Management 13 years of experience
Project Related Expertise	<p>In terms of project related expertise the EAP has completed the following projects:</p> <ul style="list-style-type: none"> <li>• cEMPr, WULA and EA amendment for the proposed Juno Gromis 400kV power line</li> <li>• Basic Assessment for the proposed Decommissioning and Demolition of Verwoedberg Substation and 275kV power.</li> <li>• Basic Assessment for the proposed Abersethin Substation and loop in and out power lines in Bethlehem.</li> <li>• Basic Assessment for Bloemendal Substation and loop in and out lines.</li> <li>• Basic Assessment for the proposed Abersethin Substation and loop in and out power lines in Bethlehem.</li> <li>• EIA for the proposed Tubatse strengthening phase 1 – Senakangwedi B integration within the jurisdiction of Greater Tubatse Local Municipality in Limpopo Province.</li> </ul>

CV attached as Appendix B.

### 3 PROJECT DESCRIPTION

Market Demand Strategy (MDS) requires Transnet Freight Rail to increase its volumes to 350 Mtpa. It is expected that unlocking the Waterberg and eventually the Botswana coal field, will contribute significantly to the targeted MDS volumes. The development of the Waterberg to Gauteng and Richards Bay corridors will strengthen the favourability of using the Southern route rather than alternative routes to Mozambique.

Consequently, rail capacity expansion has been identified as a strategic initiative that received much focus from Government as a key drive for South Africa's economy. In line with these strategic priorities for the country, Transnet has developed a programme for expansion of railway infrastructure between Lephalale in Limpopo and Pyramid South in Gauteng. The expansions will feed the heavy haul coal line for increased coal exports through the Port of Richards Bay and also deliver coal to several power stations along the existing rail route.

The scope of work entails the expansion of the railway network by construction a new  $\pm 3750\text{m}$  crossing loop to accommodate the proposed 200 wagon train length. The construction will include uplifting of the existing loop to allow for the loop expansion to be undertaken beyond the Transnet servitude; therefore an additional 2.2 hectares of land will need to be acquired. The associated infrastructure will also include the following:

- **Upgrade of Culverts**

The proposed construction of the new crossing loop and the tie in with the mainline requires extension of the five (5) existing box culverts i.e. the culverts will be demolished and replaced with bigger culverts that can better handle the Design Flood Peak Discharges Value.

- **Road demolishing and construction**

Activities will include demolishing a portion of the existing access road and rerouting of approximately 20m long and 2m width to match the existing one. Further a new 330m and 4m wide maintenance road will be constructed.

- **Relocation of Light**

The existing light pole will be relocated to clear off track work. The relocation will be within the start and end of the loop, about 3.2m from the centre.

- **Construction of Retaining wall**

Retaining walls of various sizes; at a maximum of 3245m height and 240m length will be constructed along the loop.

Additional activities will include installation of day lights and other storm water management measures.

The proposed project is a Strategic Infrastructure Project (SIP) that triggers listed activities under the GNR 327 (Listing Notice 1) and GNR 324 (Listing Notice 3). Therefore, Environmental Authorisation must be obtained in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and the Environmental Impact Assessment Regulations of December 2014 as amended.

### **3.1 DESCRIPTION OF LOCALITY**

The proposed development will take place on Farms Roodedam 368 KQ Portions 1, 19 & 20, Groofontein 352 KQ Portions 1, 2, 6 & 7 in Ward 3 within the jurisdiction of Thabazimbi Local Municipality in Limpopo Province, South Africa. Figure 1 below depicts the locality of the proposed development.

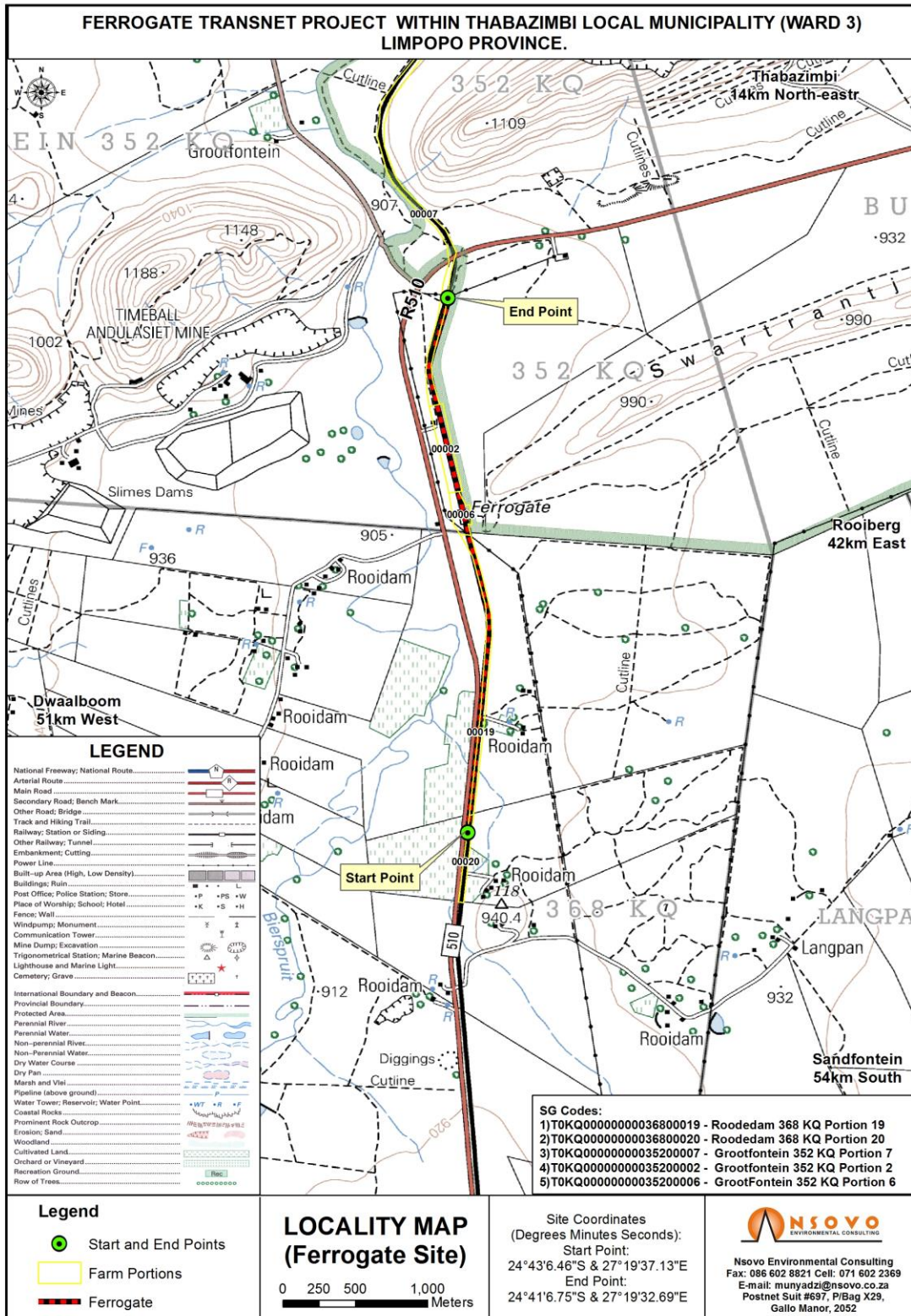


Figure 1: Locality Map

The GPS coordinates of the proposed railway loop are indicated in Table 2 below.

**Table 2:** The GPS coordinates of the center points for the railway loops

Railway loop 1	Latitude	Longitude
Start	24°43'6.46"S	27°19'37.13"E
Middle	24°42'6.04"S	27°19'38.52"E
End	24°14'6.6.75"S	27°19'32.69"E

#### 4 PURPOSE AND SCOPE OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

The EMPr sets out general environmental specifications, which are applicable to the construction activities associated with the proposed development. This document serves as a guideline for the management of the site, provides specifications and guidelines that must in all instances be adhered to. It is the responsibility of all parties, including Contractors and sub-contractors, involved in the project to commit themselves to the implementation of the EMPr in all phases of the project.

The objectives of the EMPr are to:

- Ensure that the activity is undertaken in compliance with national and provincial environmental legislations as well as local by-laws and policies.
- Ensure that Transnet's CEMP as well as the Standard Environmental Specification (SES) and other relevant policies are underwritten at all times;
- All Landowner special conditions are identified and taken into consideration as the proposed projects is located adjacent to other private properties;
- Ensure that all environmental conditions stipulated in the EA are implemented;
- Detail mitigation measures, time-frames and criteria for assessing the success or failure of each measure;
- Provide detailed monitoring programmes to ensure compliance;
- Provide input and strategies for environmental quality control and risk management;
- To preserve the natural environment by limiting destructive actions on site;
- Ensure appropriate restoration of areas affected by construction; and
- Prevent long term environmental degradation.

## 5 GENERAL ENVIRONMENTAL GUIDELINES FOR THE CONSTRUCTION PHASE

This EMPr has been compiled in fulfillment with the requirements of the National Environmental Management Act, 1998 (Act 107 of 1998). This document serves as a guideline for the management of the site by the Transnet and their Contractor as well as subcontractors, in order to minimize adverse environmental impacts. Transnet will be responsible for ensuring compliance of the Contractor with the EMPr and will rely on the Environmental Control Officer (ECO) to monitor compliance. The Contractor must in turn monitor their employees to ensure compliance with the provisions of the EMPr.

The main Contractor shall receive a copy of the EMPr from Transnet on which they will be given the opportunity to clear any misconceptions and uncertainties. The EMPr will form part of the contract and will therefore be a legally binding document. In the event of discrepancy with regard to environmental matters or environmental specifications this document shall take precedence.

## 6 APPLICABLE LEGISLATION

This list is not intended as an exhaustive analysis of the applicable environmental legislations but provides a guideline to the relevant aspects of each Act.

**Table 3:** Legislation pertaining to the proposed project

Aspect	Relevant Legislation	Brief Description
Environment	National Environmental Management: Act 1998, (Act No. 107 of 1998)	The overarching principles of sound environmental responsibility are reflected in the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), The principles set out in the National Environmental Management Act, 1998 (Act No. 107 of 1998), hereafter, referred to as NEMA, apply to all listed projects. Construction and operation have to be conducted in line with the generally accepted principles of sustainable development, integrating social, economic and environmental factors.
Biodiversity	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The purpose of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As

Aspect	Relevant Legislation	Brief Description
		part of its implementation strategy, the National Spatial Biodiversity Assessment was developed.
Protected Areas	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)	The purpose of this Act is to provide for the protection, conservation and management of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes.
Heritage Resources	National Heritage Resources Act, 1999 (Act No. 25 of 1999)	The National Heritage Resources Act, 1999 (Act No. 25 of 1999) legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 ha. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).
Air quality management and control	National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)	<p>The object of the Act is to protect the environment by providing reasonable measures for the protection and enhancement of the air quality and to prevent air pollution.</p> <p>Section 32 of The National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) deals with dust control measures in respect of dust control. Whilst none are promulgated at present, it provides that the Minister or MEC may prescribe measures for the control of dust in specified places or areas, either in general or by specified machinery or in specified instances, the steps to be taken to prevent nuisance by dust or other measures aimed at the control of dust.</p>
Noise Management and Control	Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	The assessment of impacts relating to noise pollution management and control, where appropriate, must form part of the EMPr. Applicable laws regarding noise management and control refer to the National Noise Control Regulations issued in terms of the Environment Conservation , 1989 (Act 73 of 1989).

Aspect	Relevant Legislation	Brief Description
Water	National Water Act, 1998 (Act 36 of 1998)	This Act provides for fundamental reform of law relating to water resources and use <sup>1</sup> . The preamble to the Act recognizes that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the nation’s water resources in the interests of all water users.
Agricultural Resources	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	The Act aims to provide for control over the utilization of natural agricultural resources in order to promote the conservation of the soil, water resources and vegetation and to combat weeds and invader plants. Section 6 of the Act makes provision for control measures to be applied in order to achieve the objectives of the Act.
Human	The Constitution of South Africa, 1996 (Act No. 108 of 1996)	<p>The Constitution of South Africa, 1996 (Act No. 108 of 1996) provides for an environmental right (contained in the Bill of Rights, Chapter 2). In terms of Section 7, the state is obliged to respect, promote and fulfill the rights in the Bill of Rights. The environmental right states that:</p> <p>“Everyone has the right -</p> <p>a) To an environment that is not harmful to their health or well-being; and</p> <p>b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -</p> <ul style="list-style-type: none"> <li>-Prevent pollution and ecological degradation;</li> <li>-Promote conservation; and</li> <li>-Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”</li> </ul>

Aspect	Relevant Legislation	Brief Description
Waste	National Environmental Management Waste Act, 2008 (Act 59 of 2008)	To reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for the licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.

#### 6.1 STANDARD TRANSNET POLICIES TO BE COMPLIED WITH

In addition to the approved EMPr, EA and other permits and licenses, the construction activities should also comply with the standard Transnet documents listed below. It is the responsibility of all parties involved in the implementation of the EA and EMPr to ensure that the most updated Transnet policies/documents are implemented.

#### 6.2 METHOD STATEMENTS FOR THE ACTIVITIES TO BE CARRIED OUT

The following Method Statements (MS) related to site activities must be prepared and signed by Transnet's construction team, Transnet EO and the Contractor prior to commencement of activities on site:

- Vegetation clearing;
- Fauna and flora management;
- Excavations for construction of the railway loop and associated infrastructure ;
- Chemical/hazardous substance storage;
- Cement/concrete use;
- Training and Environmental awareness,
- Fire management;
- Emergency Response;



- Storm water and soil erosion management;
- Waste management;
- Access road(s);
- Contaminated water management;
- Site establishment and site layout plan;
- Use of herbicides/pesticides;
- Temporary site closure;
- Site Rehabilitation;
- Blasting;
- Alien plants removal and use of herbicides and pesticides; and
- Dust suppression.

This list has not exhausted all the activities/aspects that may require MS prior to commencement of the work. The ECO may require more MSs to be submitted as the project progresses.

## **7 ROLES AND RESPONSIBILITIES OF THE PROJECT TEAM**

### **7.1 TRANSNET ENVIRONMENTAL OFFICER**

. The Contractor shall direct all his queries regarding any environmental issues or aspects to the ECO. The ECO should discuss the matter with Transnet and give feedback to the Contractor. The ECO shall be responsible for evaluating compliance of all aspects of the EMPr. Audits must be undertaken as per the EA conditions and in accordance with Appendix 7 of the EIA Regulations as amended and a detailed report submitted to Transnet and DEA.

Any discrepancies or areas of non-compliance with regard to the EMPr will be communicated immediately in writing, to the Contractor by the ECO. The ECO shall convey the contents of this document, the conditions of the Environmental Authorisation from DEA as well as the Landowner Special conditions to the Contractor site staff and discuss the contents in detail with Transnet Project Manager and Contractor at a preconstruction meeting. This formal induction training is a requirement of ISO 14001 and shall be done with all main and sub-contractors. Record of the training date, people whom attended and discussion points shall be kept by the ECO.

- Landowners shall be informed timeously of the construction programme, duration and all interference with their daily activities.

- The contact numbers of the ECO and Contractor Environmental Control Officer (CECO) shall be made available to Landowners.
- The ECO shall report progress made on a monthly basis to the Project Manager and Transnet.
- These reports shall be available at all times, on site or in project file and on request by auditors, and other I&APs.
- ECO shall record all Non-conformances and action plans to ensure that measures are put in place to mitigate possible effect.

## **7.2 TRANSNET ENVIRONMENTAL REPRESENTATIVE (TO ASSIST CONTRACTOR ON SITE REGARDING ENVIRONMENTAL ISSUES)**

- To implement and integrate environmental management systems by ensuring compliance to ISO 14001 & monitoring performance
- Report environmental incidents
- Provides environmental training
- Ensures compliance to legislations and other legally binding documents

## **7.3 CONTRACTOR**

The roles of the contractor included the following:

- To provide all necessary supervision during the execution of the project. He/ She should be available on site all the time.
- To appoint a competent CECO.
- To implement the projects as per the approved project plan.
- To ensure that implementation is conducted in an environmentally acceptable manner.
- To fulfil all obligations as per the agreed contract.
- To comply with special conditions as stipulated by Landowners during the negotiation process.
- To inform and educate all employees about the environmental risks associated with the different activities that should be avoided during the construction process and lessen significant impacts to the environment.

## **7.4 AUTHORISING DEPARTMENT**

The role of the Authority is to enforce compliance with the EA and the EMP. Further, the national and or local/provincial environmental authority is responsible for taking action against any non-compliance with the EMP by the Client or any of his/her subcontractors through their enforcement unit. The local/provincial authority can request a compliance audit to be undertaken on the site at any time during the development phase of the project.

## **8 DESCRIPTION OF MITIGATION MEASURES**

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The following section serves to prescribe mitigation measures to prevent, reduce, eliminate or compensate for impacts, to acceptable/insignificant levels.

## 9 PRE- CONSTRUCTION MANAGEMENT PROGRAMME

The pre-construction management programme is to be used as a guide during the planning, design and detailing of the development components. This part of the programme is to be referenced by all involved in decision making during the planning and design phases.

### 9.1 NEGOTIATIONS WITH AFFECTED LANDOWNERS

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
To ensure that landowners are aware of activities taking place within their properties.	<ul style="list-style-type: none"> <li>Ensure that all affected landowners are negotiated with prior to construction.</li> <li>Ensure that landowner special conditions are recorded and implemented.</li> </ul>	<ul style="list-style-type: none"> <li>Signed landowner consent forms.</li> </ul>	Transnet	Prior commencement of construction activities

### 9.2 COMMISSIONING OF TENDER

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
Ensure that proper environmental conditions are established prior to commencing with construction by informing all parties of appropriate environmental protection measures.	<ul style="list-style-type: none"> <li>The successful tendering Contractors will be made aware of the contents of this EMPr and any penalties arising from noncompliance prior to the commencement of work.</li> <li>All tendering Contractors will be made aware of the audit and monitoring requirements as stipulated in this EMPr.</li> <li>Appoint an Environmental Control Officer (ECO) who will be responsible to monitor compliance to the EMPr.</li> </ul>	<ul style="list-style-type: none"> <li>Signed Declaration by contractor.</li> <li>Appointment Letter</li> <li>Proof of submission to DEA.</li> </ul>	<ul style="list-style-type: none"> <li>Transnet</li> <li>Contractor</li> </ul>	Prior commencement of construction activities

	<ul style="list-style-type: none"> <li>Inform the department of the appointment of the ECO and provide the candidate's contact details.</li> </ul>			
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## 10 CONSTRUCTION MANAGEMENT PROGRAMME

### 10.1 SITE ESTABLISHMENT

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Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
To ensure minimal disturbance of the environment during the site establishment.	<p>Prior to site establishment, the Project Manager and ECO must identify suitable areas.</p> <p>Subsequently, site establishment shall take place in an orderly manner and all amenities shall be installed before the main workforce moves onto site.</p> <p>Construction camps on the site must be established on least sensitive locations preferably within already disturbed areas. After completion of the contract, these areas have to be rehabilitated.</p> <p><b>10.1.1 Site Plan:</b></p> <p>Documentation for the proposed camp site must be prepared by the Contractor prior to commencement of construction activities, and must be submitted to Transnet for approval. This documentation must include, but not limited to the</p>	<ul style="list-style-type: none"> <li>Observation</li> <li>Site Plan</li> <li>Landowner agreements</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CECO</li> <li>TER</li> </ul>	Prior to site establishment

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<p>following:</p> <ul style="list-style-type: none"> <li>• Site access (including entry and exit points).</li> <li>• All material and equipment storage areas including storage areas for hazardous substances.</li> <li>• Construction offices and other structures.</li> <li>• Security requirements including temporary and permanent fencing, and lighting.</li> <li>• Solid waste management facilities.</li> <li>• Storm water control measures.</li> <li>• Provision of potable water and mobile chemical ablution facilities.</li> </ul> <p>Throughout the period of construction, the Contractor shall restrict all activities to within the designated areas as per the construction layout plan. Any relaxation or modification of the construction layout plan is to be approved by the ECO.</p> <p><b>10.1.2 Site Camps:</b></p> <p>The following restrictions shall be placed on the site camp for the construction staff in general:</p> <ul style="list-style-type: none"> <li>• The use of water courses for washing of clothes.</li> <li>• The use of welding equipment, oxy-acetylene torches and other bare flames where veld fires can</li> </ul>			

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<p>be a hazard.</p> <ul style="list-style-type: none"> <li>• Collection of firewood.</li> <li>• Poaching of any form.</li> <li>• Use of surrounding veld as toilets.</li> </ul> <p><b>10.1.3 Vegetation clearing:</b></p> <ul style="list-style-type: none"> <li>• The natural vegetation encountered on site is to be conserved and left intact as much as possible.</li> <li>• Only flora within the construction footprint must be cleared. Clearance must be as per the approved Method statement in line with Transnet policies.</li> </ul> <p><b>10.1.4 Water for human consumption:</b></p> <p>Water for human consumption must be available at the site offices and at other convenient locations on site. Water must be obtained from an approved source.</p> <p><b>10.1.5 Sewage Treatment:</b></p> <ul style="list-style-type: none"> <li>• Chemical toilets must be supplied (1 per 15 persons) and must be regularly cleaned and maintained by the Contractor.</li> <li>• The Contractor must arrange for regular emptying of toilets and will be entirely responsible for</li> </ul>			

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<p>enforcing their use and for maintenance.</p> <ul style="list-style-type: none"> <li>The ablution facilities must be at least 100m distance from the watercourses and associated buffers.</li> <li>All ablution facilities must be anchored to prevent them from being toppled by the wind.</li> </ul>			

## 10.2 SENSITIVE ECOLOGY

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>To ensure that the sensitive area is not disturbed.</li> <li>To ensure minimal or if all possible no disturbance to the vegetation on and around the site.</li> <li>To prevent negative impact on animal life.</li> </ul>	<p>The Ferrogate Loop's northern end is situated in a CBA1 and runs through a short section of CBA2, while the southern section of the loop is within an ESA (Ecological Support Area) therefore, the following conditions must be adhered to:</p> <ul style="list-style-type: none"> <li>Demarcate the construction footprint to avoid unnecessary vegetation clearing. Ensure that 'No-Go' areas are clearly demarcated and/or fenced before construction starts. Barriers are to be maintained in good order throughout the course of the construction.</li> <li>The natural vegetation encountered on the site is to be conserved and left intact as much as possible.</li> <li>Only vegetation directly affected by the works may be felled or cleared.</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>ECO to monitor</li> <li>Site plan</li> </ul>	Transnet Contractor	Prior to construction



Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<ul style="list-style-type: none"> <li>• No open fires are permitted within naturally vegetated areas.</li> <li>• Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas.</li> <li>• Retain vegetation and soil in position for as long as possible in that area (DWAF, 2005).</li> <li>• No bush clearing is to be undertaken without the consultation with the property owner. It is recommended that the owner is informed of the basic construction process during initial interaction so that they are aware of the vegetation clearing that will occur.</li> <li>• Only manual removal of weed will be permitted on site. Chemical and mechanical (TLB, bulldozer) control is not allowed on site.</li> <li>• Implement an alien invasive plant monitoring and management plan whereby the spread of alien and invasive plant species into the areas disturbed by the construction activities are regularly removed and re-infestation monitored.</li> </ul> <p>Considering the sensitivity of the area the following measures must be implemented:</p> <ul style="list-style-type: none"> <li>• Any active faunal burrows within the development footprint</li> </ul>			

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<p>should be located and marked before construction and avoided until the occupant animals can be excluded or have moved away due to the nearby construction activities.</p> <ul style="list-style-type: none"> <li>• Any fauna threatened by construction activities should be removed to safety by the ECO or other suitably qualified person.</li> <li>• During construction all vehicles should adhere to demarcated tracks or roads and the speed limit should not exceed 30km/h on larger roads and should be 20-30km/h on smaller access tracks.</li> <li>• Where necessary, dust suppression should be used to reduce dust impacts on surrounding areas.</li> <li>• All construction staff should undergo environmental induction before construction commences in order to raise awareness and reduce potential faunal impacts.</li> <li>• To avoid impacts on amphibians, all spills of hazardous material should be cleared in the appropriate manner according to the nature and identity of the spill and all contaminated soil removed from the site.</li> <li>• Avoid sensitive faunal habitats such as drainage lines and wetlands where possible.</li> </ul>			

### 10.3 MATERIALS HANDLING, USE AND STORAGE

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>To ensure safe handling, storage use and disposal of hazardous substances.</li> <li>To ensure full compliance with the requirements of the applicable legislation.</li> </ul>	<p>The Contractor's management and maintenance of plant and machinery will be strictly monitored according to the criteria given below:</p> <p><b>10.3.1 Safety:</b></p> <ul style="list-style-type: none"> <li>All the necessary handling and safety equipment required for the safe use of hydrocarbons shall be provided by the Contractor to be used and/or worn by the staff.</li> <li>The Contractor must comply with the Occupational Health and Safety Act (Act 85 of 1993) and Construction Regulations, 2003 as this governs what the Contractor must do and provide for his staff.</li> </ul> <p><b>10.3.2 Hazardous Material Storage:</b></p> <ul style="list-style-type: none"> <li>Hydrocarbons and hazardous substances will only be stored under controlled conditions.</li> <li>All hazardous materials will be stored in a secured, designated area with restricted entry.</li> <li>Storage of hazardous products will only be in suitable containers. The containers must indicate the nature of the stored materials and Material Safety Data Sheets (MSDS).</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Incident Report</li> </ul>	ECO & Contractor CEO	Continuous throughout the construction phase

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<p><b>10.3.3 Fuels and Gas Storage:</b></p> <ul style="list-style-type: none"> <li>Fuel must be stored in a steel tank supplied and maintained by the Contractor according to safety procedures.</li> <li>The tanks/ bowsers shall be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining shall extend to the crest of the bund and the volume inside the bund shall be 110% of the total capacity of all the storage tanks/ bowsers.</li> <li>Gas welding cylinders and LPG cylinders must be stored in a secure, well-ventilated area. The Contractor must supply sufficient fire fighting equipment in the event of an accident and strictly no smoking will be allowed where fuel is stored and used.</li> </ul>			

#### 10.4 EMPR TRAINING

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
To ensure that all site personnel have basic level of environmental awareness training.	<ul style="list-style-type: none"> <li>The CECO shall arrange for Environmental Awareness Training programs for all personnel on site.</li> <li>The training must include the content of the EMP and the CECO must sensitise the team on the importance of compliance.</li> <li>Weekly toolbox talks must be undertaken by the CECO.</li> </ul>	<ul style="list-style-type: none"> <li>Signed training attendance Register</li> <li>Declaration of good conduct signed by all site personnel</li> </ul>	<ul style="list-style-type: none"> <li>CECO</li> </ul>	Prior construction and to continue throughout construction through toolbox talks.

## 10.5 WATER SUPPLY

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>To ensure availability of water for various uses as and when required.</li> <li>To ensure that water usage is minimized.</li> <li>To conserve water resources at all times.</li> <li>To encourage a 3R (Reduce, Reuse, Recycle)</li> </ul>	<p>All water for construction purposes will be sourced from commercial sources and/or the nearest Transnet depots</p> <ul style="list-style-type: none"> <li>All alternative water sources must be authorized and proof of such must be presented to the ECO.</li> <li>Should abstraction of water be necessary at any given point, the necessary Water Use License for the water source(s) must be obtained prior.</li> <li>Contractor must ensure absolute conservation of water throughout construction.</li> <li>If possible grey water must be used for dust suppression. <ul style="list-style-type: none"> <li>Contractor must supply portable water for</li> </ul> </li> </ul>	Water consumption record	ECO Contractor	Ongoing during the construction phase

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<p>human consumption at all times.</p> <ul style="list-style-type: none"> <li>Contractors shall not make use of/collect water from any other source than those pointed out to them as suitable for use.</li> <li>Given the water scarcity within the Thabazimbi Municipality, alternative dust suppression measures must be implemented were necessary.</li> </ul>			

#### 10.6 VEHICULAR ACCESS AND MOVEMENT OF CONSTRUCTION VEHICLES

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Damage to protected /endangered vegetation.</li> <li>Damage to sensitive areas.</li> <li>Erosion and loss of topsoil.</li> </ul>	<ul style="list-style-type: none"> <li>To prevent ecological damage.</li> <li>Minimise damage to the identified watercourses.</li> </ul>	<ul style="list-style-type: none"> <li>CARA</li> <li>NEMBA</li> <li>NWA</li> </ul>	<ul style="list-style-type: none"> <li>A physical access Method Statement shall be compiled by the Contractor and approved by the ECO.</li> <li>Access roads will be maintained by the Contractor. The Contractor will erect and maintain marker pegs along the boundaries of the working areas, access roads, haul roads or paths before commencing any other work. If proved insufficient for control, these will be replaced. Ensure that access roads</li> </ul>	<ul style="list-style-type: none"> <li>Access plan approved by the ECO</li> <li>No complaints from landowners.</li> <li>No access roads through wetlands</li> <li>No visible</li> </ul>	<ul style="list-style-type: none"> <li>Photographic record of private roads prior to the Contractor using the roads. Site plan</li> <li>Regular monitoring of access roads</li> </ul>	ECO & Contractor CECO	Continuous during the construction phase

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<ul style="list-style-type: none"> <li>Minimise erosion of embankments and subsequent siltation of watercourses.</li> </ul>		<p>to the site are of a suitable quality to eliminate soil erosion and channel storm water.</p> <ul style="list-style-type: none"> <li>No illegal use of private roads during construction.</li> <li>The Contractor shall sign post the access roads, immediately after the access has been negotiated.</li> <li>No roads shall cut through water courses as this may lead to erosion causing siltation of streams without necessary approval from DWS.</li> <li>All negotiated existing private access roads used for construction purposes shall be maintained at all times to ensure that the land owners have free and easy access to and from their properties.</li> <li>Where new roads are required, the disturbance area should be kept minimal (A two track dirt road will be the most preferred option).</li> <li>The Contractor must not construct a</li> </ul>	<p>erosion scars once construction is completed</p> <ul style="list-style-type: none"> <li>Erosion is not evident on slopes.</li> </ul>	<p>conditions</p> <ul style="list-style-type: none"> <li>Monitoring of impacts into the surrounding areas</li> </ul>		

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>road with a reserve wider than 13, metres, or where no reserve exists where the road is wider than 8 metres as this triggers a listed activity as per 2014 EIA Regulations as amended.</p> <ul style="list-style-type: none"> <li>• Upon completion of the project all roads shall be repaired to their original state.</li> <li>• All existing farm roads (private roads) damaged during the construction phase, should at the end of construction be repaired to the satisfaction of the landowner, as per the conditions of the written contractual agreement between the landowner and the Contractor.</li> </ul>	<ul style="list-style-type: none"> <li>• Use of designated access roads</li> <li>• No complaints from the landowners</li> <li>• No destruction of or damage to known archaeological sites</li> </ul>			

#### 10.7 MOVEMENT OF CONSTRUCTION PERSONNEL AND EQUIPMENT

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency



Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Impact on sensitive environments</li> <li>Trespassing</li> <li>Safety and security.</li> </ul>	<ul style="list-style-type: none"> <li>To ensure controlled and manageable movement of personnel and equipment.</li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>The Contractor must ensure that all construction personnel, labourers and equipment remain within the demarcated construction sites at all times.</li> <li>Where construction personnel move outside the boundaries of the site, the Contractor/ labourers must obtain permission from the CEO.</li> <li>All equipment moved onto site or off site is subject to the legal requirements as well as Transnet specifications for the transport of such equipment. The Contractor shall meet these safety requirements under all circumstances.</li> <li>All equipment transported shall be clearly labelled as to their potential hazards according to specifications.</li> <li>All the required safety labelling on the containers and trucks used shall be in place.</li> <li>The Contractor shall ensure that all the necessary precautions against damage</li> </ul>	<ul style="list-style-type: none"> <li>No trespassing of contractor's workforce.</li> <li>No complaints from landowners</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Security registers.</li> <li>Complaints register</li> </ul>	ECO & Contractor	Continuous throughout the construction phase.

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>to the environment and injury to persons are taken in the event of an accident and shall provide a Method statement to that effect.</p> <ul style="list-style-type: none"> <li>The Contractor is to ensure that no machinery, personnel, material, or equipment enters 'No-Go' areas during the course of the project.</li> </ul>				

#### 10.8 PROTECTION OF FAUNA AND AVIFAUNA

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Damage to habitat</li> <li>Negative impact on bird due to electrocution and faulting</li> <li>Negative impact on</li> </ul>	<ul style="list-style-type: none"> <li>To conserve animal life.</li> <li>To ensure that impact on natural vegetation is kept to the minimum in</li> </ul>	<ul style="list-style-type: none"> <li>NEMBA</li> <li>BDA</li> </ul>	<ul style="list-style-type: none"> <li>Vegetation clearing in natural areas should be kept to a minimum and restricted to the proposed development footprint only.</li> <li>Avoid unnecessary disturbance of faunal habitats.</li> <li>Any bird nests that are found must be left intact/undisturbed</li> </ul>	<ul style="list-style-type: none"> <li>No reported faunal injuries</li> <li>No complaints from landowners</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Complaints register that records complaints from landowners</li> <li>Daily inspection</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>CECO</li> </ul>	On-going during the construction phase.

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
animal life.	<p>order to conserve suitable habitats as much as possible.</p> <ul style="list-style-type: none"> <li>To prevent degradation of suitable sensitive fauna habitats.</li> <li>To prevent contamination of water within the nearby watercourse thereby preserving several amphibian species.</li> </ul>		<p>and must be reported to the Environmental Control Officer (ECO).</p> <ul style="list-style-type: none"> <li>Care must be taken in the vicinity of the drainage lines and existing roads must be used as much as possible for access during construction.</li> <li>Special care must be taken in sensitive avifaunal micro-habitats such as drainage lines, and wetlands</li> <li>Contractors and working staff should stay within the development footprint and movement outside these areas including avian micro-habitats must be restricted.</li> <li>Under no circumstances shall any animals (livestock or game) be hunted, handled, killed or be interfered with by the construction team.</li> </ul>				

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<ul style="list-style-type: none"> <li>To ensure that impact on sensitive fauna species is kept to a minimum</li> <li>To prevent injury or death of fauna species as a result of falling into open excavations</li> </ul>		<ul style="list-style-type: none"> <li>Domesticated animals are not allowed on site.</li> <li>The Contractor shall keep the site clean and tidy from waste material that can attract animals.</li> <li>Any open excavations must be regularly inspected to rescue any fauna that may have fallen in.</li> <li>Records of any injured or deaths of fauna within the construction servitude must be kept by the CECCECOO and ECO.</li> <li>Construction must be restricted to daylight hours to prevent any disturbance such as floodlights</li> </ul>				

#### 10.9 HERITAGE AND/OR ARCHAEOLOGICAL SITES

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency

<ul style="list-style-type: none"> <li>• Destruction of sites of archaeological and heritage significance.</li> <li>• Loss of historic cultural landscape.</li> <li>• Loss of intangible heritage value due to change in land use.</li> </ul>	<ul style="list-style-type: none"> <li>• To preserve any heritage, cultural or archaeological sites that might be encountered during the construction phase.</li> <li>• Protection of known sites against destruction, vandalism and theft.</li> <li>• Preservation and appropriate management of any new archaeological sites should this be discovered during</li> </ul>	<ul style="list-style-type: none"> <li>• NHRA</li> <li>• SES</li> </ul>	<p>The heritage significance of the site has been assessed in terms of the National Heritage Resources Act, 1999 (No 25 of 1999). No archaeological materials were identified on the proposed site, however, structures of historical importance including the existing railway line, a bulk loading structure as well as a historical light pole which are over 60 years of age were noted, and are thus protected by the National Heritage Resource Act.</p> <p>The necessary phase 2 studies as recommended by the specialist must be undertaken and permit application must be completed prior to destruction.</p> <p>The following general conditions must be adhered to:</p> <ul style="list-style-type: none"> <li>• If any archaeological material (e.g. fossils, bones, artefacts etc.) is found during excavation, the Contractor shall stop work immediately and inform the ECO and Transnet.</li> </ul>	<ul style="list-style-type: none"> <li>• Detailed record of chance finds.</li> <li>• No destruction of or damage to known archaeological sites</li> <li>• Management of existing sites and new discoveries in accordance with the recommendations of the Archaeologist</li> <li>• No litigation due to destruction of sites.</li> </ul>	<ul style="list-style-type: none"> <li>• Intermittent observation.</li> </ul>	<ul style="list-style-type: none"> <li>• ECO &amp;</li> <li>• Contractor</li> <li>• CECO</li> <li>• Archaeologist</li> </ul>	<p>On-going during all excavations</p>
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	<p>construction.</p>		<ul style="list-style-type: none"> <li>• The ECO shall inform South African Heritage Resources Agency (SAHRA) and arrange for a registered heritage specialist to inspect, and if necessary excavate the material, subject to acquiring the necessary approval from SAHRA.</li> <li>• The Contractor shall not recommence working in that area until written permission has been received from the SAHRA.</li> <li>• Under no circumstances may any heritage material be destroyed or removed from site until the necessary approval has been obtained from SAHRA. Should any remains be found on site (potential human remain) the South African Police Services should be contacted.</li> <li>• An information section on cultural resources must be included in the environmental training given to Contractors involved in earthmoving and trenching</li> </ul>				
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			<p>activities. This section must include basic information on:</p> <ul style="list-style-type: none"> <li>○ Heritage;</li> <li>○ Graves;</li> <li>○ Palaeontology;</li> <li>○ Archaeological finds; and</li> <li>○ Historical Structures.</li> </ul>				
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#### 10.10 SERVICING AND RE-FUELLING OF CONSTRUCTION EQUIPMENT

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>• Impact on soil and water resources due to accidental spillages.</li> </ul>	<ul style="list-style-type: none"> <li>• To conserve soils, surface and ground water.</li> <li>• To prevent spillages of hazardous substances</li> </ul>	<ul style="list-style-type: none"> <li>• NEMWA</li> <li>• NWA</li> <li>• OHSA</li> <li>• SES</li> </ul>	<ul style="list-style-type: none"> <li>• All maintenance and repair work will be carried out within an area designated for this purpose, equipped with necessary pollution containment measures.</li> <li>• Refuelling, greasing or oiling of vehicle and construction machinery must be done on a drip tray or bunded surface.</li> <li>• Drip trays must be placed under stationary vehicles and machinery at all times.</li> </ul>	<ul style="list-style-type: none"> <li>• No evidence of hazardous substances polluting the site.</li> </ul>	<ul style="list-style-type: none"> <li>• On-going monitoring with regular inspections; and</li> <li>• Service Records.</li> </ul>	<ul style="list-style-type: none"> <li>• ECO &amp;</li> <li>• Contractor</li> <li>• CEO</li> </ul>	<p>On-going during the construction phase</p>

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<ul style="list-style-type: none"> <li>Construction vehicles are to be maintained in an acceptable state of repair. No vehicles or equipment with leaks or causing spills will be permitted on site.</li> <li>Fuels required during construction must be stored at a central depot that must be located on a slab and be contained within a bund capable of containing at least 110% of the total volume in the containers.</li> <li>Temporary fuel storage tanks and transfer areas also need to be located on an adequately bunded surface to contain accidental spillages.</li> </ul>				

#### 10.11 WASTE MANAGEMENT

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency



Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>• Visual Impact</li> <li>• Water resources</li> <li>• Land pollution</li> </ul>	<ul style="list-style-type: none"> <li>• To ensure the efficient management of waste on site</li> <li>• To ensure minimal impact on the surrounding environment</li> <li>• Minimise waste material being strewn in the environment</li> </ul>	<ul style="list-style-type: none"> <li>• NEMWA</li> <li>• SES</li> </ul>	<p>The generation of waste is inevitable at construction sites. Therefore general mitigations including the following :</p> <ul style="list-style-type: none"> <li>• General waste, consisting of non-hazardous substances and hazardous substances that cannot be recycled. Examples include (but not limited to rubble, that cannot be reused, and food waste). This will be disposed and collected in a waste skip and disposed of at a registered site.</li> <li>• Re-usable and excess material (sleepers, pins and ballast), which can be used at the sites will be reused and the remainder will be carefully packaged and transported to the depot.</li> <li>• Hazardous waste will be disposed of accordingly at a registered hazardous waste disposal site.</li> <li>• Refuse will at all times be</li> </ul>	<ul style="list-style-type: none"> <li>• Presence of proper storage facilities that are properly labelled.</li> <li>• Post-construction work areas are clear of all waste materials.</li> </ul>	<ul style="list-style-type: none"> <li>• Intermittent Observation</li> <li>• Waste Disposal Records</li> </ul>	<ul style="list-style-type: none"> <li>• ECO &amp;</li> <li>• Contractor</li> <li>• CECO</li> </ul>	Daily

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>disposed of at a registered landfill site, which is also approved by the local authority.</p> <ul style="list-style-type: none"> <li>Refuse will not be burned or buried on or near the site but will be appropriately disposed of</li> </ul> <p>Records of the type and quantity of waste disposed will be kept on site.</p> <p><b>10.11.1 SOLID WASTE MANAGEMENT</b></p> <ul style="list-style-type: none"> <li>Waste must be separated at source (e.g. containers for glass, paper, metals, plastic, organic waste and hazardous waste).</li> <li>An adequate number of scavenger proof refuse bins must be provided at the construction site and must be clearly labelled (general or hazardous) according to waste streams.</li> <li>All waste must be transported in an appropriate manner (e.g.</li> </ul>				

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>plastic rubbish bags) and disposed of at a licensed waste disposal facility. Proof of safe disposal must be kept on site.</p> <ul style="list-style-type: none"> <li>• The Contactor may not dispose of any waste and / or construction debris by burning, or burying.</li> <li>• Waste bins must be emptied regularly (minimum weekly) such that they do not overflow.</li> <li>• The Contractor shall maintain 'good housekeeping' practices and ensure that all work sites and the construction camp is kept tidy and litter free.</li> <li>• The necessary approvals for the storage areas must be sought and recommendation made adhered to.</li> </ul> <p><b>10.11.2 LIQUID WASTE MANAGEMENT</b></p>				

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<ul style="list-style-type: none"> <li>An adequate number of suitable containers with lids must be provided at the construction site.</li> <li>The Contractor will ensure that waste water is discharged in the drums provided.</li> <li>All waste must be transported in an appropriate manner and disposed of at a licensed waste disposal site.</li> </ul>				

#### 10.12 SURFACE AND GROUND WATER MANAGEMENT

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Possible contamination of water</li> </ul>	<ul style="list-style-type: none"> <li>To conserve all natural water</li> </ul>	NWA	<ul style="list-style-type: none"> <li>Water use related activities must be approved by DWS prior to commencement. Conditions and</li> </ul>	<ul style="list-style-type: none"> <li>Unpolluted water course</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Design Plans</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>ECO</li> <li>CECO</li> </ul>	Continuous through the construction

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
resources.	<p>resources</p> <ul style="list-style-type: none"> <li>To avoid illegal diversion and destruction of water resources.</li> <li>To ensure proper management of storm water run-off that causes erosion and siltation/sedimentation</li> <li>To ensure that the rivers and streams are protected and incur minimal negative impact from</li> </ul>		<p>recommendations of the WUL must be adhered to at all times.</p> <ul style="list-style-type: none"> <li>No unauthorised activities should occur within a 100m or within the 1:100 year flood line.</li> <li>The Contractor must take reasonable precautions to prevent the pollution of ground and surface water resources as a result of construction activities.</li> <li>No natural watercourse is to be used for the cleaning of tools. This includes for purposes of bathing, or washing of clothes etc.</li> <li>No spills may be hosed into the surrounding natural environment.</li> <li>All soil contaminated must be excavated to the depth of contaminant penetration, placed in suitable drums/containers and removed to a hazardous waste facility.</li> </ul>	•			phase.

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<p>the development.</p> <ul style="list-style-type: none"> <li>To ensure compliance with the requirements of the Act.</li> </ul>		<ul style="list-style-type: none"> <li>No extraction of water from any natural resources without the relevant authorisation.</li> <li>Erosion control measure must be put in place to control storm water runoff.</li> <li>Storm water management measures must be as per the Method Statement prepared by the Contractor for ECO and TER approval.</li> <li>Erosion control on all access roads must be undertaken.</li> <li>Any physical damage to any aspect of a watercourse must be prohibited.</li> <li>Minimize the extent of damage to flood plains that is necessary to complete the works, and will not pollute any water course as a result of construction.</li> </ul>				

### 10.13 SENSITIVE AREAS (WATER COURSES AND BUFFERS)

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Changing the quantity and fluctuation properties of the watercourse.</li> <li>Changing the amount of sediment entering water resource and associated change in turbidity (increasing or decreasing the amount)</li> <li>Alteration of water quality toxic contaminants (including toxic</li> </ul>	<ul style="list-style-type: none"> <li>To preserve and conserve the sensitive environment</li> </ul>	NWA	<p>Two (2) small wetlands associated with the Bierspruit River present on the proposed Ferrogate Loop. The following mitigation measures must be considered during different phases of the project:</p> <ul style="list-style-type: none"> <li>Construction in and around watercourses must be restricted to the dryer winter months where possible.</li> <li>Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005).</li> <li>Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover.</li> <li>Rehabilitation plans must be submitted and approved for rehabilitation of damage during construction and that plan must be implemented immediately upon</li> </ul>	<ul style="list-style-type: none"> <li>Undisturbed sensitive environments and/or properly rehabilitated.</li> <li>Compliance with the WUL conditions</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>WUL</li> </ul>	<ul style="list-style-type: none"> <li>CECO</li> <li>ECO</li> <li>Contractor</li> </ul>	Throughout the construction and post construction to ensure proper rehabilitation.

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<p>metal ions (e.g. copper, lead, zinc) and hydrocarbons.</p> <ul style="list-style-type: none"> <li>Changing the physical structure within a water resource.</li> </ul>			<p>completion of construction.</p> <ul style="list-style-type: none"> <li>Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access.</li> <li>During the construction phase measures must be put in place to control the flow of excess water so that it does not impact on the surface vegetation.</li> <li>Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.</li> <li>Runoff from the construction area must be managed to avoid erosion and pollution problems.</li> <li>Implementation of best management practices</li> <li>Source-directed controls</li> </ul>				



Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<ul style="list-style-type: none"> <li>Monitoring should be done to ensure that sediment pollution is timeously adressed.</li> <li>No stockpiling of any materials may take place adjacent to any of the water resources and associated buffer zones. Erosion control measures must be implemented in areas sensitive to erosion and where erosion has already occurred. These measures include but are not limited to - the use of sand bags, hessian sheets, silt fences, retention or replacement of vegetation and geotextiles such as soil cells which must be used in the protection of slopes.</li> <li>Do not allow surface water or storm water to be concentrated, or to flow down slopes without erosion protection measures being in place.</li> <li>All disturbed areas must be rehabilitated as soon as construction is complete or near complete and not left</li> </ul>				

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>until the end of the project to be rehabilitated.</p> <ul style="list-style-type: none"> <li>Any channel banks that will be affected must be re-profiled as per the original soil horizon structure and re-vegetated with indigenous species.</li> <li>Make use of existing access roads as much as possible and plan additional access routes to avoid vegetation communities.</li> <li>Minimise the extent of the work footprint as far as possible.</li> <li>Do not locate the construction camp or any depot for any substance which causes or is likely to cause pollution within a distance of 100m of the delineated water resources.</li> <li>Proper management and disposal of construction waste must occur during the construction of the development.</li> <li>No release of any substance i.e. cement, oil, that could be toxic to</li> </ul>				

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>fauna or faunal habitats within the watercourses.</p> <ul style="list-style-type: none"> <li>• Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities (not to be disposed of within the natural environment). Any contaminated soil must be removed and the affected area rehabilitated immediately.</li> <li>• A spill contingency plan must be drawn up for the construction phase. .</li> <li>• Vehicles must not be permitted to be cleaned or serviced in or near aquatic ecosystems. Vehicle servicing if necessary must take place offsite.</li> <li>• Construction must take place during the dry season to avoid the risk of rainfall events transporting construction chemicals downslope.</li> <li>• Cordon-off areas that are under</li> </ul>				

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>rehabilitation as no-go areas. If necessary, these areas should be cordoned off to prevent vehicular, pedestrian and livestock access.</p> <ul style="list-style-type: none"> <li>• Runoff from roads must be managed to avoid erosion and pollution problems.</li> <li>• Demarcate the watercourses and buffer zones to limit disturbance and clearly mark these areas as no-go areas.</li> <li>• Recommendation from Department of Water and Sanitation as part of the licencing process must be taken into consideration throughout the construction phase.</li> </ul>				

#### 10.14 HAZARDOUS MATERIALS

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>• Impact on soils and water</li> </ul>	<ul style="list-style-type: none"> <li>• To ensure safe and proper</li> </ul>	<ul style="list-style-type: none"> <li>• HSA</li> </ul>	<ul style="list-style-type: none"> <li>• The Contractor must comply with all National, Regional and Local legislation with regard to the storage, transport,</li> </ul>	<ul style="list-style-type: none"> <li>• No incidents reported</li> </ul>	<ul style="list-style-type: none"> <li>• Hazardous material data sheet</li> </ul>	<ul style="list-style-type: none"> <li>• ECO &amp;</li> <li>• Contractor</li> <li>• CECO</li> </ul>	<ul style="list-style-type: none"> <li>Continuous throughout the construction</li> </ul>

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
resources	handling of hazardous material		<p>use and disposal of petroleum, chemical, harmful and hazardous substances and materials.</p> <ul style="list-style-type: none"> <li>• Spill kits must be made available on site at all times.</li> <li>• The CECO will furthermore be responsible for the training and education of all personnel on site who will be handling the material about its proper use, handling and disposal.</li> <li>• Storage of all hazardous material is to be safe, tamper proof and under strict control.</li> <li>• Exercise extreme care with the handling of diesel and other toxic solvents to ensure that spillage is avoided.</li> <li>• Any accidental chemical / fuel spills must be remediated immediately.</li> </ul>		<ul style="list-style-type: none"> <li>• Incident reports</li> <li>• Observation of spillages and leakages</li> </ul>		phase

### 10.15 OIL SPILL MANAGEMENT

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Impact on soils and water resources</li> </ul>	<ul style="list-style-type: none"> <li>To avoid ground and surface water contamination</li> <li>To ensure proper and safe handling of oil spillages.</li> </ul>	<ul style="list-style-type: none"> <li>HSA</li> <li>NEMBA</li> </ul>	<ul style="list-style-type: none"> <li>The Contractor must prevent potential hydrocarbon spills during construction.</li> <li>Hydrocarbon must be stored in properly contained areas so as to minimise accidental spillage.</li> <li>Use of drip trays under stationary vehicles. All spills must be reported to the ECO within 24 hours of the spill via a flash report.</li> <li>The Contractor must be in possession of a mobile oil spill kit at all times.</li> <li>The oil spill clean-up and rehabilitation standards need to be implemented.</li> </ul>	<ul style="list-style-type: none"> <li>No incident reported</li> <li>Proper use of drip trays</li> <li>Presence of oil spill kit</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Incident report</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CECO</li> </ul>	On-going during the construction phase.

#### 10.16 STORM WATER MANAGEMENT

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Possible negative impact on water</li> </ul>	<ul style="list-style-type: none"> <li>To reduce the potential impact from runoff on sensitive areas.</li> </ul>	<ul style="list-style-type: none"> <li>NWA</li> </ul>	<ul style="list-style-type: none"> <li>The Contractor must ensure that rainwater pollutants from construction activities does not run-off into natural areas and thus result in a pollution</li> </ul>	<ul style="list-style-type: none"> <li>No evidence of erosion</li> <li>No evidence of increased</li> </ul>	<ul style="list-style-type: none"> <li>Site Plan</li> <li>Observation</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CECO</li> </ul>	Continuous during the construction

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
resources			<p>threat.</p> <ul style="list-style-type: none"> <li>Storm water shall be diverted from the construction works.</li> <li>Storm water management measures must be as per the Storm water Management Method Statement prepared by the Contractor for ECO approval.</li> <li>Increased runoff due to vegetation clearance and/or soil compaction must be managed and steps must be taken to ensure that storm water does not lead to excessive levels of silt entering the watercourses.</li> <li>Necessary storm water control mechanisms shall be employed to ensure the sustainability of all the structures.</li> <li>Effort shall be made to ensure that storm water leaving the construction site is not contaminated by any substance, whether solid, liquid or gas.</li> </ul>	<p>siltation</p> <ul style="list-style-type: none"> <li>No evidence of contaminated water courses.</li> </ul>			

## 10.17 FIRE

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>• Destruction of property</li> <li>• Loss of life</li> <li>• Destruction of crops and livestock</li> </ul>	<ul style="list-style-type: none"> <li>• To prevent open fires.</li> <li>• To ensure that the workforce is aware of emergency procedures should an incident occur</li> </ul>	<ul style="list-style-type: none"> <li>• NEMA</li> <li>• NVFFA</li> </ul>	<ul style="list-style-type: none"> <li>• A fire Management Method Statement must be put in place by the Contractor. Landowners must be consulted in order to incorporate their specific fire fighting measures. The Method Statement must be approved by the ECO.</li> <li>• All the necessary precautions to ensure that fires are not started as a result of activities on site must be implemented.</li> <li>• Fuels or chemicals must be stored at the designated storage area.</li> <li>• Gas and liquid fuels must not be stored in the same storage area.</li> <li>• All fire control mechanisms (fire fighting equipment) will be made available and accessible at all times and routinely inspected.</li> <li>• No open fires for heating or cooking will be permitted on site, unless</li> </ul>	<ul style="list-style-type: none"> <li>• No reported fire incidents</li> <li>• No loss of life</li> <li>• No traces of cigarettes butts outside the designated smoking area.</li> </ul>	<ul style="list-style-type: none"> <li>• Fire Management Plan</li> <li>• Daily checks</li> </ul>	<ul style="list-style-type: none"> <li>• ECO</li> <li>• Contractor</li> <li>• CECO</li> </ul>	On-going during the construction phase



Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>agreed and then only on designated areas.</p> <ul style="list-style-type: none"> <li>Designated smoking areas must be provided, with special bins for discarding of cigarette stump.</li> <li>Fire must be reported immediately.</li> </ul>				

#### 10.18 AIR POLLUTION

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Dust nuisance from excavations, vegetation clearing and dirt roads.</li> <li>Exhaust fumes from construction vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>To ensure proper mitigation of air pollution</li> <li>To avoid dust nuisance from excavation activities and vehicles</li> </ul>	<ul style="list-style-type: none"> <li>NEMAQA</li> <li>APPA</li> <li>ECA</li> </ul>	<p>The potential air pollutants would be dust emanating from blasting, excavation activities and access roads; emissions or exhaust fumes from faulty plant or equipment. The following measures must be put in place:</p> <ul style="list-style-type: none"> <li>Appropriate dust suppression measures or temporary stabilising mechanisms (e.g. adherence to speed limit, chemical soil binders, straw, brush packs chipping) must be put in place throughout construction,</li> </ul>	<ul style="list-style-type: none"> <li>No complaints from surrounding land owners recorded.</li> <li>No evidence of dust pollution plumes on</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Complaints register</li> </ul>	<ul style="list-style-type: none"> <li>ECO</li> <li>Contractor</li> <li>CECO</li> </ul>	On-going throughout the construction phase

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	on dirt roads		<p>particularly during prolonged periods of dry weather.</p> <ul style="list-style-type: none"> <li>• Removal of vegetation must be avoided until such time as soil stripping is required.</li> <li>• No burning of waste material is allowed.</li> <li>• A maximum speed of 30km/hr. on the access road must be adhered to in order to minimise or avoid dust pollution.</li> <li>• Construction vehicles and equipment must be in good working order and serviced regularly.</li> </ul>	<p>site.</p> <ul style="list-style-type: none"> <li>•</li> </ul>			

### 10.19 NOISE IMPACT

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Noise during excavation/drilling of foundations and associated activities</li> </ul>	<ul style="list-style-type: none"> <li>To ensure minimal noise disturbance</li> <li>To ensure proper mitigation of noise.</li> <li>To avoid noise nuisance from operating construction equipment.</li> </ul>	<ul style="list-style-type: none"> <li>SES</li> <li>NEMA</li> </ul>	<ul style="list-style-type: none"> <li>Noise associated with the construction activities can be mitigated by limiting the construction operation to business hours.</li> <li>Machinery and vehicles are to be maintained in good working order.</li> <li>The project team must endeavour to keep noise generating activities associated with construction to a minimum and within working hours.</li> <li>Any complaints pertaining to noise must be recorded and reported to the ECO and addressed accordingly. Labourers to be provided with hearing protection as and when required.</li> </ul>	<ul style="list-style-type: none"> <li>No complaints from surrounding land owners recorded.</li> </ul>	<ul style="list-style-type: none"> <li>Noise monitoring</li> <li>A register of complaints to be kept on site at all times and kept up to date.</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>ECO</li> <li>CECO</li> </ul>	On-going during the construction phase

### 10.20 VISUAL IMPACT

Possible Impact	Objective	Applicable Legislation/ Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
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Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Loss of sense of place.</li> </ul>	<ul style="list-style-type: none"> <li>To ensure proper mitigation of potential visual impacts.</li> <li>To maintain the site's aesthetics.</li> </ul>	<ul style="list-style-type: none"> <li>NEMA</li> </ul>	<ul style="list-style-type: none"> <li>Storage facilities and other temporary structures on site must be located such that they have as little visual impact on local residents as possible.</li> <li>Soil excavated (if any) must not be stockpiled above 2m.</li> <li>All temporary structures erected on site for the purposes of the project's construction phase will be removed from site upon completion of the project.</li> <li>Lighting will be sufficient to ensure security but will not constitute 'light pollution' to the surrounding areas.</li> <li>The site must be clean and tidy at all times.</li> </ul>	<ul style="list-style-type: none"> <li>Clean and tidy site.</li> <li>No complaints from the landowners and affected parties.</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Complaints register</li> </ul>	<ul style="list-style-type: none"> <li>ECO &amp; Contractor</li> <li>CECO</li> </ul>	<ul style="list-style-type: none"> <li>On-going during the construction phase.</li> </ul>

#### 10.21 TRAFFIC IMPACT

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Possible traffic increase</li> <li>Car accident</li> </ul>	<ul style="list-style-type: none"> <li>To maximise road safety, and</li> </ul>	<ul style="list-style-type: none"> <li>NLTA</li> </ul>	<ul style="list-style-type: none"> <li>Given the proximity of the R510 to the Ferrogate site, it is recommended that a Traffic Management Plan be put in place</li> </ul>	<ul style="list-style-type: none"> <li>No increase in accident rate</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Complaints report</li> </ul>	<ul style="list-style-type: none"> <li>Contractor /</li> <li>ECO</li> <li>CECO</li> </ul>	<ul style="list-style-type: none"> <li>On-going during the construction phase</li> </ul>

<ul style="list-style-type: none"> <li>Irregular traffic pattern during construction phase.</li> <li>Impact on road safety, congestion, wear and tear of the road surface.</li> </ul>	<p>minimise congestion</p> <ul style="list-style-type: none"> <li>To ensure that traffic impacts as a result of the construction related activities are minimized.</li> </ul>		<p>prior to construction.</p> <ul style="list-style-type: none"> <li>Effective traffic control must take place throughout the construction phase.</li> <li>Access roads will be maintained by the Contractor and will ensure that access roads to the site are of a suitable quality to eliminate soil erosion and channel storm water.</li> <li>Strategic positioning of entry and exit points to ensure as little impact/ effect as possible on the traffic flow.</li> <li>Use minibus or taxis to minimise traffic.</li> <li>Monitor adherence to traffic regulations.</li> <li>Monitor drivers for use of alcohol and other substances that could impair judgment and driving.</li> <li>Ensure that loads on trucks are properly secured during transport.</li> <li>Schedule arrival and departure of heavy vehicles to avoid morning and afternoon peak hours.</li> </ul>	<ul style="list-style-type: none"> <li>No complaints from the landowners and affected parties</li> </ul>			
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**10.22 EXCAVATION, BACKFILLING AND TRENCHING**

Possible Impact	Objective	Applicable Legislation/P	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
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		Policy					
<ul style="list-style-type: none"> <li>Possible erosion</li> <li>Injury of animal life</li> </ul>	<ul style="list-style-type: none"> <li>To prevent erosion.</li> <li>To ensure safety for both human and animals.</li> </ul>	<ul style="list-style-type: none"> <li>OHSA</li> <li>APA</li> </ul>	<p>While working at areas prone to erosion the following must be adhered to:</p> <ul style="list-style-type: none"> <li>Excavations must not be left open for longer than 30 days.</li> <li>Excavations must be barricaded/ fenced off at all times.</li> </ul>	<ul style="list-style-type: none"> <li>No incidence of animals trapped in trenches reported</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Incident report</li> </ul>	<ul style="list-style-type: none"> <li>Contractor /</li> <li>ECO</li> <li>CECO</li> </ul>	On-going excavations

### 10.23 EROSION AND CONTROL

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Impact on soils and habitats and sensitive environs.</li> </ul>	<ul style="list-style-type: none"> <li>To prevent erosion and sedimentation.</li> </ul>	<ul style="list-style-type: none"> <li>NWA</li> <li>CARA</li> </ul>	<p>To prevent any form of erosion the following must be adhered to:</p> <ul style="list-style-type: none"> <li>During construction, the Contractor will protect areas susceptible to erosion by installing necessary temporary and / or permanent drainage and by taking suitable measures to prevent surface water concentration into nearby roadways.</li> <li>Prior to construction, all topsoil must be stripped and stockpiled separately from subsoil and rocky material. Soil must be stripped in a phased manner so as to</li> </ul>	<ul style="list-style-type: none"> <li>No visible signs of erosion.</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Complaints register</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>ECO</li> <li>CECO</li> </ul>	On-going particularly during excavations

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>retain vegetation cover for as long as possible.</p> <ul style="list-style-type: none"> <li>• Stockpiled topsoil must not be compacted and must be replaced as the final soil layer.</li> <li>• Stockpiled soil must be protected by erosion-control berms if exposed for a period of greater than 14 days during the wet/windy season.</li> <li>• Topsoil stockpiles must not be contaminated with oil, diesel, petrol, waste or any other foreign matter, which may inhibit the later growth of vegetation and micro-organisms in the soil.</li> <li>• Soil must not be stockpiled on drainage lines or near watercourses.</li> <li>• The timing of clearing and grubbing must be co-ordinated as much as possible to avoid prolonged exposure of soils to wind and water erosion.</li> <li>• If topsoil will be stockpiled for a longer period, it must be either vegetated with indigenous grasses or covered with a</li> </ul>				

Possible Impact	Objective	Applicable Legislation /Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
			<p>suitable material to prevent erosion and invasion by weeds.</p> <ul style="list-style-type: none"> <li>• Where required, cut-off trenches can be installed to divert substantial run-off and prevent erosion as and when necessary.</li> <li>• Where new roads are constructed, water diversion berms should be constructed to prevent erosion.</li> <li>• Sensitive areas such as watercourses (wetlands, Non-perennial River and riparian areas) must be cordoned off to control vehicles and construction personnel access.</li> <li>• Any roads along slopes should have water diversion structures placed at regular intervals to ensure that they do not capture overland flow and become eroded.</li> </ul>				

#### 10.24 USE OF CEMENT AND CONCRETE



Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Soil, surface and ground water pollution.</li> </ul>	<ul style="list-style-type: none"> <li>To conserve soils, surface and groundwater.</li> <li>To minimise waste concrete from polluting the environment</li> </ul>	<ul style="list-style-type: none"> <li>NEMA</li> <li>NEMWA</li> <li>HSA</li> <li>SES</li> </ul>	<p>Cement and concrete are regarded as highly hazardous to the natural environment due to their high pH and the chemicals contained therein. To avoid ground pollution the following must be implemented:</p> <ul style="list-style-type: none"> <li>Pre-mix concrete shall be the preferred option where possible.</li> </ul> <p>If concrete mixing is undertaken on site, the following measures must be put in place:</p> <ul style="list-style-type: none"> <li>The batching / mixing area must be properly designated, indicated on the site plan and kept neat and tidy at all times.</li> <li>No batching / mixing activities will occur on a permeable surface.</li> <li>Unused cement bags will be stored and disposed of appropriately.</li> <li>The visible remains of the batch plant and concrete, either solid, or from washings shall be physically removed and disposed of appropriately at a licensed landfill site if not reused.</li> </ul>	<ul style="list-style-type: none"> <li>Areas of construction are clear of all concrete residue/waste following construction.</li> </ul>	<ul style="list-style-type: none"> <li>Observation</li> <li>Site Plan</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>ECO</li> <li>CECO</li> </ul>	Throughout the construction phase

## 10.25 SITE CLEAN-UP AND REHABILITATION

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>Erosion</li> <li>Spread of alien invasive plant species</li> </ul>	<ul style="list-style-type: none"> <li>Minimise damage to topsoil and environment at tower positions</li> <li>Successful rehabilitation of all damaged areas</li> <li>Prevention of erosion.</li> <li>To ensure that the site is</li> </ul>	<ul style="list-style-type: none"> <li>NEMBA</li> <li>NEMA</li> </ul>	<ul style="list-style-type: none"> <li>The Contractor must ensure that all temporary structures, materials, waste and facilities used for construction activities are removed upon completion of the project.</li> <li>Fully rehabilitate (e.g. clear and clean area, rake, pack branches etc.) all disturbed areas and protect them from erosion.</li> <li>All replaced equipment and excess gravel, stone, concrete, bricks, temporary fencing and the like shall be removed from the site upon completion of the work.</li> <li>No discarded materials of any nature shall be buried on the site or on any other land within the site.</li> <li>Re-seeding shall be done on disturbed areas as per the rehabilitation Method Statement and as directed by the CECO and</li> </ul>	<ul style="list-style-type: none"> <li>No loss of topsoil due to construction activities</li> <li>No loss of topsoil due to construction activities</li> <li>All disturbed areas successfully rehabilitated within three months of completion of the contract</li> <li>No visible erosion scars three months after completion of</li> </ul>	<ul style="list-style-type: none"> <li>Rehabilitation Plan</li> <li>Observation</li> </ul>	ECO CECO Contractor	On completion of construction  Random surveys by landowner

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
	<p>fully rehabilitated to its original state.</p> <ul style="list-style-type: none"> <li>To ensure that the site is clean and neat.</li> <li>Minimize claims and litigation from landowners</li> </ul>		<p>ECO.</p> <ul style="list-style-type: none"> <li>The Contractor shall reuse all excess material from site.</li> </ul>	<p>the contract</p> <ul style="list-style-type: none"> <li>No open fires shall be allowed on site under any circumstance</li> <li>No evidence of rubble or litter left on site.</li> <li>Successful completion of the contract with all landowners signing the release form six months after completion of the project.</li> </ul>			

## 10.26 INFRASTRUCTURE

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>• Damage to fence, gates and other services</li> <li>• Loss of livestock</li> </ul>	<ul style="list-style-type: none"> <li>• Minimise damage to infrastructure such as fence, gates.</li> <li>• Prevent loss of livestock</li> <li>• Minimize claims and litigation from landowners</li> </ul>	Fencing Act (Act 31 of 1963)	<ul style="list-style-type: none"> <li>• The Contractor must ensure that all gates are left in the state as required by the landowner.</li> <li>• The Contractor must not interfere with landowner's locks.</li> <li>• No gates must be left open.</li> <li>• The climbing/crawling over/through fences without the permission of the landowner must be prohibited.</li> </ul>	<ul style="list-style-type: none"> <li>• No complaints from the landowners with regards to broken fences and gates.</li> <li>• All gates closed during the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>• Complaints register</li> <li>• Observation</li> </ul>	<ul style="list-style-type: none"> <li>• ECO</li> <li>• CECO</li> <li>• Contractor</li> </ul>	<ul style="list-style-type: none"> <li>• During construction and completion of construction</li> <li>• Random surveys landowner</li> </ul>

## 11 OPERATION MANAGEMENT PROGRAMME

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>• Access roads used for maintenance might impact on vegetation and water courses.</li> <li>• Bird collisions with the moving train.</li> <li>• Waste generation during the operation phase will have a negative impact on the</li> </ul>	<ul style="list-style-type: none"> <li>• To prevent ecological damage.</li> <li>• Minimise damage to the identified watercourses.</li> <li>• Reduce the deaths of birds caused by collision and electrocution.</li> <li>• To prevent littering on site by storing waste appropriately.</li> <li>• Prevent loss of life of people and livestock due to electrocution.</li> </ul>	<p>NEMA NWA NEMWA NEMBA OHSA</p>	<p><b>11.1.1 Access road</b></p> <ul style="list-style-type: none"> <li>• Existing access roads should be used as far as possible, ensuring proper maintenance and upgrade.</li> <li>• No vehicles should be allowed to cross water courses in any area other than an approved crossing.</li> <li>• Appropriate erosion measures must be in place to prevent any impact in surrounding habitat.</li> </ul> <p><b>11.1.2 Avifauna</b></p> <ul style="list-style-type: none"> <li>• Reduce the speed at which the train would be traveling.</li> </ul> <p><b>11.1.3 Waste</b></p> <ul style="list-style-type: none"> <li>• Disposal of waste must be in accordance with relevant legislative requirements.</li> </ul>	No complaints from the land owners.	<ul style="list-style-type: none"> <li>• Complaints register</li> <li>• Observation</li> </ul>	<ul style="list-style-type: none"> <li>• Project Manager</li> <li>• ECO</li> </ul>	Weekly

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<p>environment, if not controlled adequately.</p> <ul style="list-style-type: none"> <li>Waste generation during the operational phase will have a negative impact on the environment if not controlled adequately.</li> </ul> <p>Waste will include general and hazardous wastes.</p>			<ul style="list-style-type: none"> <li>The Contractor must familiarize themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation.</li> <li>Burning of waste material will not be permitted.</li> </ul> <p><b>11.1.4 Safety</b></p> <ul style="list-style-type: none"> <li>Safety and security issues should be addressed as a priority. It is recommended that the landowners are contacted in advance to ensure that they are forewarned of the maintenance activities planned in the area.</li> </ul>				

Possible Impact	Objective	Applicable Legislation/Policy	Mitigation / Management Action	Performance Indicator	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>There is the potential risk of electrocution (people and livestock) if access to the site is not controlled.</li> </ul>							

### 11.1 MONITORING OF EMPR COMPLIANCE

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
To implement an on-going monitoring and performance audit programme.	<ul style="list-style-type: none"> <li>• The correct and successful implementation of impact mitigation measures in order to reduce adverse impacts on environmental aspects needs to be ensured by a proper monitoring program.</li> <li>• Monitoring of the general implementation of/adherence to the EMPr shall be the responsibility of the ECO.</li> <li>• Reporting on adherence/compliance to stipulations as communicated to Contractors, shall take place during scheduled site meetings.</li> <li>• Regular site meetings by the project team.</li> <li>• Continuous induction of staff and visitors on the EMPr conditions and requirements.</li> <li>• Put in place non-conformance, prevention and corrective procedures.</li> </ul>	<ul style="list-style-type: none"> <li>• Observation</li> <li>• Checklist</li> <li>• Daily Register</li> <li>• Attendance Registers</li> <li>• Photographic evidence</li> <li>• Audit and Monitoring Reports</li> </ul>	<ul style="list-style-type: none"> <li>• ECO &amp;</li> <li>• Contractor</li> <li>• CECO</li> </ul>	On-going post rehabilitation.



## 11.2 DOCUMENT CONTROL

Objective	Mitigation / Management Action	Monitoring Criteria	Responsible Agent	Monitoring Frequency
<ul style="list-style-type: none"> <li>• To ensure compliance with the requirements of the regulatory authority</li> <li>• To assign roles and responsibilities to ensure compliance</li> <li>• To implement and comply with the requirements of the EMPr.</li> </ul>	<ul style="list-style-type: none"> <li>• A copy of the EMPr and the EA will be made available on site at all times.</li> <li>• The EMPr as well as the EA will be used for referral as the project progresses. The EA will also be presented on request to I&amp;APs and stakeholders who may visit the site.</li> <li>• Monitoring and Audit Reports must be submitted to DEA and copies filed.</li> </ul>	<ul style="list-style-type: none"> <li>• Availability of an EMPr copy on site</li> <li>• Report submission Transmittal</li> </ul>	<ul style="list-style-type: none"> <li>• ECO &amp;</li> <li>• Contractor</li> <li>• CECO</li> </ul>	<p>On-going during the construction phase.</p>

## **12 SUMMARY OF LAND OWNER DETAILS AND CONDITIONS**

All contact with the landowners shall be courteous at all times. The rights of the landowners shall be respected at all times and all staff shall be sensitised to the effect that there are other private properties involved in the project. Transnet shall ensure that all agreements reached with the Landowner are fulfilled. Should any claim be instituted against Transnet, due to the actions of the Contractor Transnet shall hold the Contractor fully responsible for the claim until such time that the Contractor can prove otherwise with the necessary documentation.

## **13 GENERIC CONDITIONS**

In order to ensure compliance with Transnet's environmental policy as well as environmental legislation requirements, the following generic conditions are applicable:

### **13.1 SITE DOCUMENTATION/MONITORING**

The standard Transnet site documentation shall be used to keep records on site. All documents shall be kept on site and be available for monitoring and auditing purposes. Site inspections by an Environmental Audit Team may require access to this documentation for auditing purposes. The documentation shall be signed by all parties to ensure that such documents are legitimate. Regular monitoring of all site works by the Environmental Control Officer is imperative to ensure that all problems encountered are solved punctually and amicably. When the Environmental Control Officer is not available, the Transnet Construction Manager shall keep abreast of all works to ensure no problems arise.

Environmental Monitoring reports shall be submitted to the appointed Transnet Environmental Officer by the CECO with all information relating to environmental matters. The following Key Performance Indicators must be reported on a fortnightly basis:

- Complaints received from Landowners and actions taken.
- Environmental incidents, such as oil spills, concrete spills, etc. and actions taken (litigation excluded).
- Incidents possibly leading to litigation and legal contraventions.
- Environmental damage that needs rehabilitation measures to be taken.

The following documentation shall be kept on site:

- Access negotiations and physical access plan.
- Complaints register.
- Site daily diary.
- Records of all remediation / rehabilitation activities.
- Copy of the EMPr and EA.

The ECO shall further prepare monthly Environmental Monitoring reports which will cover the activities undertaken as well as the status of compliance on site. Copies of the monthly reports shall be submitted to Transnet, as well as the DEA. Furthermore, monthly reports will be kept on site either as hard or soft copy.

### **13.2 AUDITS**

Audits shall be undertaken in accordance with the requirement of Appendix 7 of the EIA Regulations of December 2014 as amended.

During the construction period at least monthly Environmental Audits shall be conducted by the ECO to determine compliance with the recommendations of the EMPr and conditions of the EA.

The appointed ECO, as well as the contractors on site, are responsible for ensuring compliance with the EMPr. It is recommended that periodic EMPr compliance reports (audits) are compiled by the ECO and submitted to CECO for correction of non-compliance issues. It is the responsibility of the ECO to report any non-compliance, which is not correctly rectified to the DEA.

### **13.3 ACCESS TO DOCUMENTS**

Interested and Affected Parties (Landowners) must be allowed access to the EMPr document should they so wish. They have the right to monitor specific aspects of the Construction and Operation EMPr in conjunction with the ECO and Contractor in a reasonable and informal manner, without unreasonably disrupting construction activities.

### **13.4 SOCIO-CULTURAL ISSUES**

- A plan of action must be drawn up in the case of an emergency (veld fire, vegetation problems etc.)
- Property owners or occupiers must be treated with respect and courtesy at all times;
- The culture and lifestyles of the communities living in close proximity to the proposed development must be respected;
- Removal of agricultural products is prohibited. Receipts must be obtained for any merchandise purchased or received from landowners;
- Vehicles must be driven carefully in hazardous road conditions (sharp bends, narrow roads, bad weather, children playing on or near the road, domestic animals on or near the road etc.). Vehicle movement must be kept to a minimum during rain to avoid damage to the access road;
- Environmental clauses (as referred to in this Construction and Operation EMPr) must be included into contract documents for all contractors;
- Tribal graves, archaeological sites and sites of historical interest are to be treated with respect and protected.

- No firewood is to be collected except with the written consent of the landowner; and
- A register must be maintained of all complaints or queries received as well as action taken.

#### **14 FAILURE TO COMPLY WITH THE ENVIRONMENTAL CONSIDERATIONS**

The ECO will, acting reasonably, have the authority to order the Contractor to suspend part or all of the works if the he causes unacceptable damage to the environment by not adhering to the specifications set out below. The suspension will be enforced until such time as the offending parties' actions, procedures and/or equipment are corrected and adequate mitigation measures implemented.