

SOUTH AFRICAN NATIONAL ROADS
AGENCY LTD.



**N2 Intersections and Rehabilitation of Access
Roads at Qhora, KuLeleyo and eMambabala Village,
Eastern Cape.**

Environmental Management Programme

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1 GLOSSARY OF TERMS, DEFINITIONS AND ABBREVIATIONS

The following terms, definitions and abbreviations have been used in this EMPr:

Listed in alphabetical order

Construction activity	A construction activity is any action taken by the Contractor, his sub-contractors, suppliers or personnel during the construction process.
Contractor	That main organisation appointed by the Developer, through the Project Manager, to undertake construction activities on the site.
DEA	Department of Environmental Affairs.
Developer	South African National Road Agency Limited
EAP	Environmental Assessment Practitioner.
ECO	Environmental Control Officer. The ECO monitors compliance with the EMPr during the construction phase and advises the Project Manager on environmental matters relating to construction.
EMPr	Environmental Management Programme. The EMPr for the project sets out general instructions that will be included in a contract document for the construction phase of the project. The EMPr will ensure the construction activities are conducted and managed in an environmentally sound and responsible manner. The EMPr also details the organisational structure required to ensure the effective implementation of the EMPr and measures to monitor and improve the application of the EMPr.
Environment	Means the surroundings within which humans exist and that are made up of: <ol style="list-style-type: none">The land, water and atmosphere of the earth;Micro-organisms, plant and animal life;Any part or combination of a) and b) and the interrelationships among and between them; andThe physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.
Environmental Specifications	Instructions and guidelines for specific construction activities designed to help prevent, reduce and/or control the potential environmental implications of these construction activities.



Method Statement	<p>Is a written submission by the Contractor to the Project Manager in response to the Specification setting out the plant, materials, labour, timing and method the Contractor proposes using to carry out an activity.</p> <p>The Method Statement shall cover applicable details with regard to:</p> <ul style="list-style-type: none">• Construction procedures• Materials and equipment to be used• Getting the equipment to and from site• How the equipment/material will be moved while on site• How and where material will be stored• The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or solid material that may occur• Timing and location of activities• Compliance/ non-compliance with the Specifications• Any other information deemed necessary by the Resident Engineer
Project	<p>This refers to all construction activities associated with the proposed activities.</p>
PM	<p>Project Manager</p> <p>Appointed consulting engineering firm responsible for overall management of the construction phase of the project including the management of all Contractors.</p>
Rehabilitation	<p>Rehabilitation is defined as the return of a disturbed area, feature or structure to a state that approximates to the state (where possible) that it was before disruption, or to an improved state.</p>
SANRAL	<p>South African National Roads Agency Limited</p>
Solid waste	<p>Means all solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).</p>

2 INTRODUCTION

GIBB (Pty) Ltd (GIBB) has been appointed by the South African National Roads Agency Limited (SANRAL) as consulting engineers for the proposed rehabilitation of the National Route 2 (N2).

This specific Environmental Management Programme (EMPr) is written in support of an application for Environmental Authorisation (EA) in the form of a Basic Assessment for a project component, which entails the development of two (2) formalised intersections on the N2 and the upgrade of internal access roads for villages positioned adjacent to the N2.

The site for this specific project is located within the Qhora village (32°13'51.81" S and 28°12'55.91" E), the kuLeleyo village (32°14'40.09" S and 28°14'58.87" E) and the 32°13'6.63" S and 28°13'14.38" E) which lie approximately 15 km south of Idutywa, along the N2 in the Mbashe Local Municipality (please refer to Figure 1).

The rehabilitation will entail:

- Approximately 8.2 km of existing gravel access roads which traverse the eMambabala, Qhora and kuLeleyo villages will be upgraded to 4 m wide tarred roads including side drains as required:
 - The existing gravel road varies between 3 and 4 m wide and will be reshaped and recompacted as a sub-base for the new road
 - A new bitumen treated base (BTB) will be constructed on top of the reworked subbase. It will be 3.5m wide and will be done by labour intensive methods
 - 1.0 m gravel shoulders will be constructed on the edges of the BTB, also on top of the reworked subbase
 - The BTB will be surfaced with a 13mm cape seal.
- The closure of one (1) informal intersection which links from the Qhora village to the N2.
- Upgrading of the N2 by developing a formalised and strategically located intersection that links the Qhora and eMambabala villages to the N2 and which do not pose a threat to oncoming traffic.
 - This constitutes the widening N2 on either side to include a third, turn-off lane at the intersection.

This road rehabilitation EMPr specifically deals with all construction activities associated with the road rehabilitation. The EMPr parameters for the road rehabilitation works will be introduced below.

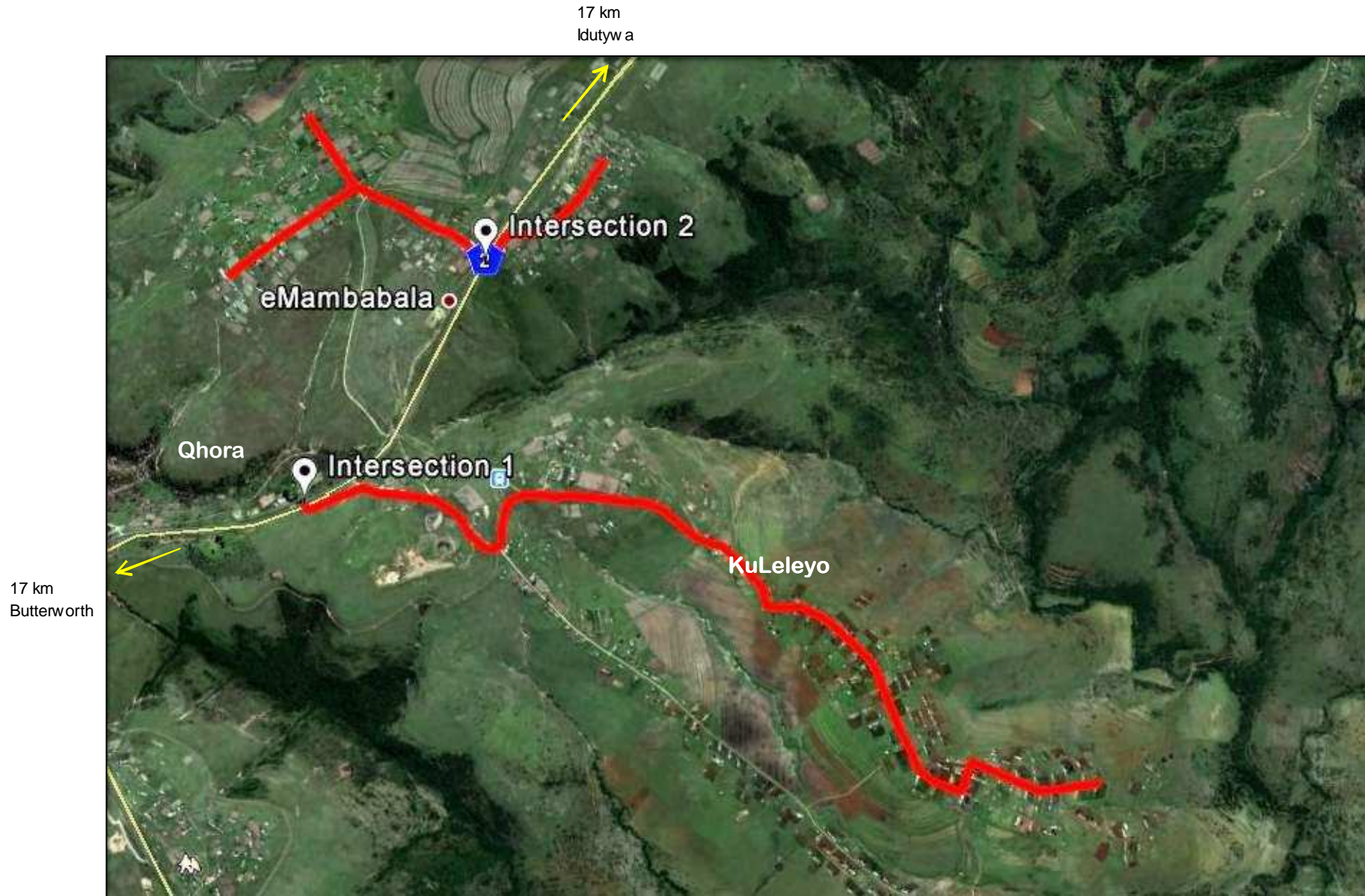


Figure 1. Aerial Map indicating the access road to be upgraded (red line), the road closure and the location of the proposed intersection

2.1 Description of the Proposed Activities

The Basic Assessment Report (BAR) for this project was prepared in accordance with the EIA Regulations published in Government Notice No. R543. These regulations fall under Section 24(5) read with Section 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended in 2010) (NEMA).

The NEMA Section 24(5) stipulates that “listed activities” require environmental authorization by way of a Basic Assessment or full Environmental Impact Assessment. The following Listed Activities are triggered by the proposed development:

Government Notice No. 544 (Listing Notice 1) identifies the following listed activities:

- 47. The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre –
 - (i) Where the existing road is more than 13,5 meters

Government Notice No. 546 (Listing Notice 3) identifies the following listed activities:

- 19. The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre:
 - (a) In Eastern Cape province
 - ii. Outside urban areas, in:
 - (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans

2.2 Details of the Project Proponent

The South African National Roads Agency Limited (Southern Region)

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Newton Park, Port Elizabeth, 6001
Postal Address: P.O. Box 27230, Greenacres, PE, 6057
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2.3 Details of the Environmental Assessment Practitioner (EAP)

Mervin Olivier is an Environmental Scientist with 18 years of experience. He is a Technical Executive at GIBB and has managed a number of high profile environmental projects in Africa. Mervin specialises in Environmental Auditing, Integrated Waste Management, Environmental Impact Assessments, Environmental Management Plans, Environmental Management Systems and Safety, Health and Risk Management.

Mervin is a registered lead environmental auditor with TÜV SÜD and is Lead Auditor with SAATCA for the Reprocessing of Previously Certified Packaging (including drums and IBCs). Mervin has led several environmental and waste projects in Nigeria, Angola and Malawi.

Qualifications: M.Soc.Sci. (Geographical and Environmental Sciences)

Registrations: SAI and ES, 2000

Mary-Anne Crocker is an environmental scientist with four years of experience. Mary-Anne specialises in Safety, Health and Environmental Management Systems Implementation and auditing; Basic Assessments; Environmental Impact Assessment; Environmental Control Officer auditing; Integrated and Industry Waste Management Plans; Licensing of Waste Facilities ; Water Use Licensing.

Qualifications: B.Sc. Hons. (Environmental Science)

2.4 Project Alternatives

An alternative site or route for the road was not considered to be a viable option as it would have a much higher impact. Therefore, a route/site alternative was not assessed for this project.

Only the preferred alternative will be dealt with in this EMPr as other alternatives have been eliminated in the planning phase of this project.

2.5 Environmental Management Programme

2.5.1 Purpose of an Environmental Management Programme (EMPr)

The preparation of an Environmental Management Programme (EMPr) is recognised as a tool in Integrated Environmental Management (IEM) to manage impacts on site. Typically an EMPr document is aligned to the project progress cycle addressing each project phase i.e. the construction, operation and decommissioning phases. Due to the nature of this particular project, virtually all negative environmental impacts are anticipated during the construction phase and hence this EMPr will place emphasis on the construction activities.

The purpose of this EMPr is therefore to:

- To outline the roles and responsibilities of the project managers, engineers, Contractors, Sub-Contractors, the Environmental Control Officer (ECO) and the authorities
- Provide a description of the methods and procedures for mitigating and monitoring impacts (Environmental Specification)
- To describe penalties for non-compliance.

3 ORGANISATION AND MANAGEMENT STRUCTURE

3.1 Contractual obligation

In order to ensure that the EMPr and/or derivatives are enforced and implemented, these documents must be given some form of legal standing. This shall be achieved through incorporating the EMPr and/or derivatives documents as an addendum to the contract documents for the particular project and specifying under particular conditions of the contract for the tender that the requirements of the EMPr and/or derivatives apply and must be met. This will ensure that the obligations are clearly communicated to Contractors and that submitted tenders have taken into account, and budgeted for the environmental requirements specified in the EMPr and/or its derivatives. The successful tender ultimately becomes the signed contract, thereby ensuring that the included EMPr is legally binding.

3.2 The Developer

The South African National Roads Agency Limited (SANRAL) is the developer and has overall responsibility for ensuring that the construction and development of the project is undertaken in an environmentally sound and responsible manner, and in particular, reflects the requirements and specifications of the EMPr and recommendations from the relevant authorities.

3.2.1 Role

SANRAL will be required to assume overall responsibility for the environmental aspects of the construction and development of the project.

3.2.2 Responsibilities

The responsibilities of the developer will include the following:

- Establish and maintain regular and proactive communications with the EAP, Resident Engineer, Contractor and ECO.
- Review and comment on environmental reports produced by the ECO.
- Ensure that the EMPr is reviewed and updated as necessary.

3.2.3 Reporting Structure

The developer will liaise with and/or take instruction from the following:

- Authorities
- General Public.

3.3 Project Manager (PM)

SANRAL has appointed GIBB as consulting engineers to oversee the rehabilitation of the N2. GIBB will act as the Project Manager (PM). The PM will ensure that the approved EMPr is included in the contract documentation issued to prospective Contractors.

3.3.1 Role

The success of environmental compliance is determined to a large degree by the continual presence of the technically responsible party.

Specific to the implementation of the EMPr, the role of the PM will be to:

- Review and approve Method Statements produced by the Contractor in connection with the EMPr.
- Oversee the general compliance of the Contractor with the EMPr and other pertinent site specifications.
- Liaise between and with the Contractor and ECO on environmental matters, as well as any pertinent engineering matters where these may have environmental consequences.

3.3.2 Responsibilities

The PM's responsibilities will include:

- Be familiar with the contents of the EMPr.
- Communicate to the Contractor, verbally and in writing, the advice of the ECO and the contents of the ECO reports.
- Request for, review and approve the Method Statements prepared by the Contractor in consultation with the ECO.
- Review and approve drawings produced by the Contractor or professional team in connection with, for example, the construction site layout, access/ haul roads and so on.
- Issue site instructions giving effect to the ECO requirements where applicable.
- Review complaints received and make instructions as necessary.
- Maintain a register of complaints from the public and communicate these to the Contractor and the ECO.
- Discuss with the ECO the application of penalties for the infringement of the Environmental Specifications, and other possible enforcement measures when necessary.
- Issue penalties as and when necessary.
- Implement temporary work stoppages as advised by the ECO, where serious environmental infringements and non-compliances have occurred.
- Facilitate proactive communication between all role-players in the interests of effective environmental management.

3.3.3 Reporting Structure

The PM will report to the developer, as and when required.

3.4 Environmental Control Officer (ECO)

SANRAL must appoint a suitably qualified person as ECO, who is comprehensively briefed on site management and environmental issues. The ECO will monitor, review and verify the implementation of the EMPr. The ECO will be an ongoing appointment for the duration of the construction process. The ECO must be independent from the Contractor and Sub-Contractors, and must have appropriate authority to ensure that the EMPr is fully implemented and that appropriate actions are undertaken to address any discrepancies and non-compliances.

3.4.1 Role

The overall role of the ECO is to be the site custodian for the implementation, integration and maintenance of the EMPr in accordance with the contractual requirements. The ECO will be required to liaise with the PM on the level of compliance with the EMPr achieved by the Contractor on a regular basis for the duration of the contract.

3.4.2 Responsibilities

The ECO will have the following responsibilities, at a minimum:

- To advise the PM on the interpretation and enforcement of the Environmental Specifications (ES), including discussions on non-compliances.
- To supply environmental information as and when required.
- To review and approve Method Statements produced by the Contractor with the PM.
- To demarcate particularly sensitive areas (including all “No-go” areas) and to pass instructions through the PM concerning works in these areas.
- To monitor any basic physical changes to the environment as a consequence of the construction works – e.g. evidence of erosion, dust generation and silt loading in runoff – on a weekly basis.
- Attend regular site meetings between engineers and Contractors.
- To undertake regular monthly audits of the construction works and to generate monthly audit reports. These reports are to be forwarded to the PM, the Developer, and the Environmental Authority (DEA).
- To communicate frequently and openly with the Contractor and the PM to ensure effective, proactive environmental management, with the overall objective of preventing or reducing negative environmental impacts and/or enhancing positive environmental impacts.
- To advise the PM on remedial actions for the protection of the environment in the event of any accidents or emergencies during construction, and to advise on appropriate clean-up activities.
- Review complaints received and make instructions as necessary.
- Identify and make recommendations for minor amendments to the EMPr as and when appropriate.
- Ensure that the Contractor, his employees and/or Sub-Contractors receive the appropriate environmental awareness training prior to commencing activities.

3.4.3 Reporting Structure

The ECO will report to the Project Manager and DEA.

3.5 Contractor

The Developer will appoint a Contractor/s to construct the development. The Contractor/s will be contractually required to undertake their activities in an environmentally responsible manner, as described in the EMPr.

3.5.1 Role

Specific to the EMPr, the role of the Contractor/s will be to:

- Implement, manage and maintain the EMPr for the duration of his/her contract.
- Designate, appoint and/or assign tasks to personnel who will be responsible for managing all or parts of the EMPr.
- Assign appropriate authority, accountability and responsibility for these personnel to carry out their duties.
- Ensure that all Sub-Contractors and other workers appointed by the Contractor/s are aware of their environmental responsibilities while on site or during the provision of their services off site.
- Ensure that all Sub-Contractors and other workers appointed by the Contractor/s are complying with and implementing the EMPr during the duration of their specific contracts.
- Provide appropriate resources including budgets, equipment, personnel and training for the effective control and management of the environmental risks associated with the construction.

3.5.2 Responsibilities

The Contractor/s will have the following responsibilities:

- Be familiar with the contents of the EMPr.
- Comply with the Environmental Specifications contained in the EMPr and subsequent revisions.
- Confirm legislative requirements for the construction works, and to ensure that appropriate permissions and permits have been obtained before commencing activities.
- Prepare Method Statements, programme of activities and drawings/plans for submission to the PM (and ECO).
- Review the site inspection reports and take cognisance of the information and implement recommendations contained therein.
- Notify the ECO and PM, verbally and in writing, immediately in the event of any accidental infringements of the Environmental Specifications and ensure appropriate remedial action is taken.
- Notify the ECO and PM, verbally and in writing at least 10 working days in advance of any activity he/she has reason to believe may have significant adverse environmental impacts, so that mitigatory measures may be implemented timeously.

- Ensure environmental awareness among employees, Sub-Contractors and workforce so that they are fully aware of, and understand the Environmental Specifications and the need for them.
- Maintain a register of environmental training for site staff and Sub-Contractor's staff for the duration of the contract.
- Undertake the required works within the designated working areas.
- Rehabilitating services, utilities, private/public property and other areas adversely affected by construction activities outside of demarcated areas in accordance with the PM's instructions.
- Communicate and liaise frequently and openly with the PM and ECO to ensure effective, proactive environmental management with the overall objective of preventing or reducing negative environmental impacts while enhancing positive environmental impacts.

3.5.3 Reporting Structure

The Contractor/s will receive instructions from the PM.

3.6 Sub-Contractors

3.6.1 Role

The Contractor may from time to time appoint Sub-Contractors to perform certain services and/or provide certain products in association with the construction and development of the project.

3.6.2 Responsibilities

Sub-Contractors shall comply with the Environmental Specifications in the EMPr and associated instructions issued by the Contractors to ensure compliance. Sub-Contractors and their staff will be required to take part in the environmental awareness training as instructed by the Main Contractor.

3.6.3 Reporting Structure

Sub-Contractors will receive instructions from the Main Contractor/s.

4 ENVIRONMENTAL SPECIFICATIONS

4.1 Preamble

The following section comprises a minimum range of constraints, controls, procedures and standards that are typically required for the construction activities of the project.

4.2 Planning

4.2.1 Environmental Principles for the Construction Works

- (a) The environment is considered to be composed of both biophysical and social components.
- (b) Construction is a disruptive activity and all due consideration must be given to the environment, including the social environment during the execution of a project to minimise the impact on affected parties.
- (c) Minimisation of areas disturbed by construction activities (i.e. the 'footprint' of the construction area) should minimise many of the construction related environmental impacts of the sub-project and reduce rehabilitation requirements and costs.
- (d) All relevant standards relating to international, national, provincial and local legislation, as applicable, should be adhered to. This includes requirements relating to waste emissions, waste disposal practices, noise regulations, road traffic ordinances, etc.
- (e) All relevant permits and permissions shall be obtained from the relevant authorities to undertake construction activities as necessary.
- (f) Every effort should be made to minimise, reclaim and/or recycle waste materials.
- (g) The Contractor will be required to prepare an Environmental Policy Statement that will state his commitment to achieving the basic principles for environmental protection and control for the duration of his contract. This statement will be displayed at the site as part of the Environmental Information Poster display.

4.2.2 Compliance with Environmental Legislation

- (a) The Contractor shall ensure that all pertinent legislation concerning the protection of the natural environmental are kept in a site file and prevention of pollution is strictly enforced.
- (b) The ECO/PM shall maintain a database of all pertinent legislation, regulations and guidance pertinent to the environmental management of the activities being undertaken.

4.2.3 Permits and Permissions

- (a) The Contractor shall ensure that all pertinent permits, certificates and permissions have been obtained prior to any activities commencing on site and are strictly enforced/ adhered to.

- (b) The Contractor shall maintain a database of all pertinent permits and permissions required for the contract as a whole and for pertinent activities for the duration of the contract.

4.2.4 Construction Method Statements

- (a) The Contractor shall submit written Method Statements to the PM for the activities identified by the PM and/or the ECO.
- (b) Method Statements indicate what will be done to comply with relevant environmental specification as set out in the EMPr.
- (c) Method Statements shall be submitted at least 5 working days prior to the proposed commencement of work on an activity to allow the PM (and/or ECO) time to study and approve the method statement.
- (d) The Contractor shall not commence work on that activity until such time as the Method Statement has been approved in writing by the PM.
- (e) The Contractor shall carry out the activities in accordance with the approved Method Statement.
- (f) Under certain circumstances the PM may require changes to an approved Method Statement. In such cases the proposed changes must be agreed upon in writing between the Contractor and the PM, and appropriate records retained.
- (g) Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel.
- (h) Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the contract.

4.2.5 Non working times

- (a) No noisy construction works shall be executed except between sunrise and sunset on Monday to Saturday, inclusive, of any week, unless work is necessary for the saving of life or property or for the safety of the work.
- (b) In cases where construction works are required after hours, the approval of the PM must be obtained before such works commence.

4.2.6 Safety at the construction site

Extra safety precautions must be taken to ensure that residents and pedestrians residing in the area do not come to harm.

- (a) Construction areas, open sewers/storm water, and other potential construction-related danger areas must be clearly demarcated with hazard tape and/or be fenced if appropriate.
- (b) The construction site shall be off limits to the general public at all times during the construction period and site cleanup.
- (c) The Contractor should ensure that hazard and warning signs are erected in the relevant languages at appropriate positions warning traffic of construction activities ahead and at problem sites, and that they are maintained in good condition.
- (d) The Contractor must ensure that all staff is compliant with the relevant safety regulations on site and wears applicable safety clothing and gear at all times while on site.

4.2.7 Social disruption

- (a) The Contractor's staff shall in no way be a nuisance to residents, consumers or clients seeking the services of the established businesses in the area. Any complaints received by the PM will be investigated, addressed and, if deemed necessary, the relevant persons will be suspended from the project.
- (b) The Contractor shall give at least seven days notice to the residents in the vicinity of the construction activities of his intention to begin construction activities in their area.
- (c) The PM may request a representative of the Contractor to be available to discuss issues raised by residents and make information available to them on construction activities.

4.2.8 Existing Services and Infrastructure

- (a) It is the Contractor's responsibility to familiarise himself with the position of existing services and infrastructure that may get damaged due to construction activities.
- (b) The Contractor shall ensure that existing services (e.g. roads, pipelines, power lines and telephone services) are not damaged or disrupted unless required by the contract and with the permission of the PM.
- (c) The Contractor shall be responsible, at his own cost, for the repair and reinstatement of any infrastructure that is damaged or services that are interrupted.
- (d) Such repair or reinstatement will be to the Contractor's cost and shall receive top priority over all other activities.
- (e) A time limit for the repairs may be stipulated by the PM in consultation with the Contractor.

4.2.9 Traffic congestion

- (a) The movement of trucks to and from the construction site must be well coordinated by the PM or his representative at all times, so as to cause the least disruption to the residents in the area during the morning and afternoon rush hour traffic.
- (b) Large trucks and other heavy-duty machinery may not be left unattended in any of the access roads.
- (c) Appropriate signage indicating road works ahead, narrowing of the road and relevant detours must be erected at strategic locations, clearly observable by all road users by day and night.

4.2.10 Prevention of damage to buildings and street trees

- (a) The Contractor, and his staff, must be extra vigilant, during the construction activities, to prevent damage from occurring to any buildings, road furniture, established street trees and motor vehicles located in the vicinity of the construction site.
- (b) Any complaints received from the public regarding any of the listings above shall be investigated and, if substantiated, may result in suspension or dismissal of the guilty party.

4.2.11 Closure of lanes during construction

- (a) A single lane should always be left open for residents/farmers to reach their properties.
- (b) All lane closures and erection of warning signs must comply with the appropriate official municipal, provincial or SANRAL specifications governing road works.

4.2.12 Traffic calming and accident preventative measures

- (a) All traffic calming measures must be constructed or erected according to the appropriate official municipal, provincial or SANRAL specifications governing road works.
- (b) The traffic calming measures must meet the geometric standard and must be approved by the PM.

4.2.13 Unpleasant visual impact at the construction site

- (a) The Contractor shall ensure that the construction site is kept neat and tidy at all times during the design and planning, and construction phase of the project.
- (b) General and construction related waste shall, upon approval by the PM, be contained and stored in the appropriate manner as prescribed by relevant governing regulations.
- (c) Where appropriate, boundaries of the construction and/or Contractor's camp site shall be cordoned off with appropriate material, e.g. wood/plywood boards, to minimise unpleasant visual impacts of the construction site.

4.3 Site Establishment

4.3.1 Site Division and Contractor's Camp

- (a) The site for the Contractor's Camp shall be determined in collaboration with the PM and ECO before the Contractor moves on site, such that it is effectively isolated from the surrounding environment and takes into consideration:
 - The need to be more than 100 meters from a water body in a position that will facilitate the prevention of storm water runoff from the site from entering a water body.
 - The risk of public nuisance through for example, noise generation, visual intrusion, light pollution or disruption to access, is reduced.
 - Security implications are reduced.
- (b) The Contractor's Camp should also be of sufficient size to accommodate the needs of all Sub-Contractors that may work on the project.
- (c) Utilities and other Service Providers such as Telkom and Eskom shall be advised of the construction activities. The Contractor will be responsible for any damage to these services/utilities.

4.3.2 Site Identification

- (a) A demarcated area or site camp at or close to the site must be provided by the Contractor for the storage of machinery and trucks as necessary.
- (b) The Contractor will produce a plan illustrating the proposed site camp and proposed working areas. The plan must be approved by the PM.
- (c) The site camp shall be fenced and provided with a lockable access gate to prevent vandalism, theft and unauthorised entry by the public.
- (d) If the proposed site camp is to be situated on private land, approval must be obtained from the landowner.
- (e) It will be the responsibility of the Contractor to reinstate the site camp to its original condition once the project has been completed.
- (f) The working areas shall be kept to a minimum to reduce the total physical 'footprint' of the construction site thereby reducing environmental damage.
- (g) The Contractor shall not use the land for the site camp for any purpose other than for the proper carrying out of the works under the contract.

4.3.3 Site Demarcation

- (a) Prior to construction commencing, the Contractor, PM and ECO shall inspect the site and identify any sensitive environments (as defined in the Environmental Specification).
- (b) Where necessary, the "No-go" areas shall be demarcated using materials as specified by the PM. These may include fencing, rope, hazard tape, wire mesh, or other approved materials or means.
- (c) The Contractor will be required to maintain all demarcation fencing and other demarcating materials for the duration of construction activities or as otherwise instructed by the PM.
- (d) The Contractor shall ensure that, insofar as he has the authority, no person, plant equipment or material enters the "No-go" areas at any time.

4.4 Site Housekeeping

4.4.1 Site Housekeeping

- (a) The Construction Site and surrounds are to be maintained in a clean orderly and presentable condition at all times.
- (b) Monthly inspections by the ECO of all facilities will be undertaken using checklists to ensure a minimum standard of orderliness is maintained.

4.4.2 Workshop

- (a) All routine maintenance of equipment and vehicles shall be performed in the Contractor's workshop off site.
- (b) If it is unavoidable to do maintenance on site, the Contractor shall obtain the approval of the PM prior to commencing activities and confine maintenance activities to an area identified and approved by the PM or ECO.
- (c) The Contractor shall ensure that there is no contamination of the soil or surface water from any unavoidable emergency maintenance activities. Each Contractor must have a spill control kit and staff appropriately trained to utilise it.

4.4.3 Equipment Maintenance and Storage

- (a) All vehicles and equipment shall be kept in good working order and shall be stored in the site camp or an area approved by the PM.
- (b) All stationary plant must be supplied with drip trays to prevent soil contamination.
- (c) Leaking equipment shall be repaired immediately or removed from the site.
- (d) Washing of equipment shall only be undertaken at the site camp in an area approved by the PM and ECO.

4.4.4 Cooking Facilities

- (a) The Contractor shall designate cooking and eating areas, subject to the approval of the PM.
- (b) Any cooking on site shall be done on either well-maintained gas cookers or by contained fires (e.g. in a drum). These should be located away from flammable vegetation or construction materials.
- (c) The cooking and eating areas must be kept tidy and clean at all times to prevent the luring of vermin, domesticated or wild animals.
- (d) The following will not be permitted:
 - (i) Any workers residing on the site.
 - (ii) Cooking outside the designated areas and in particular beyond the site.
 - (iii) Open cooking fires or fires for heating.
- (e) Sufficient bins with vermin proof lids for waste disposal, as described in the Environmental Specification, shall be present within a 5 m radius of this area at all times.

4.4.5 Light Pollution

- (a) The Contractor shall ensure that any lighting installed on site for his activities does not interfere with road traffic or cause a reasonably avoidable disturbance to the surrounding community or other uses or the area – particularly during the night time.
- (b) Where the Contractor has been authorised to undertake night work, low glare lighting shall be used.

4.4.6 Security

- (a) Appropriate fencing, security gates, shelter, signage and/or security guards are to be provided at the construction site to ensure the security of all equipment and materials, as well as to secure the safety of site staff.
- (b) The entrance gates to the site camp shall be locked after hours to discourage theft and vandalism.

4.4.7 General Materials Handling, Use and Storage

- (a) Materials shall be appropriately secured to ensure safe passage between destinations. Loads including, but not limited to sand, stone chip, fine vegetation, refuse, paper and cement, shall have appropriate cover to prevent them from spilling from the vehicle during transit.
- (b) Delivery drivers informed of procedures and restrictions, and supervised during off loading.
- (c) Laydown areas approved by the Engineer.

- (d) The Contractor shall be responsible for any clean-up resulting from the failure by his staff or supplier to properly secure transported materials.
- (e) Strip and stockpile herbaceous vegetation, overlying grass and other fine organic matter along with the topsoil.
- (f) Do not strip topsoil when it is wet.
- (g) Stockpile topsoil stripped from different sites separately, as reapplication during rehabilitation must preferably be site specific. If necessary keep a stockpile register.
- (h) Do not mix topsoil obtained from different sites, unless approved by the ECO.
- (i) Do not stockpile topsoil in drainage lines.
- (j) Do not stockpile topsoil in heaps exceeding 2 m in height.
- (k) Remove exotic / invasive plants and broad leaf weeds that emerge on topsoil stockpiles.

4.4.8 Fuels, Oils, Hazardous Substances and other Liquid Pollutants

- (a) All potentially hazardous raw and waste materials are to be handled by the Contractor's trained staff and stored on site in accordance with manufacturer's instructions and legal requirements.
- (b) Appropriate training for the handling and use of such materials is to be provided by the Contractor as necessary. This includes providing for any spills and pollution threats that may occur.
- (c) Products should be clearly labelled and symbolic safety/hazard warning signs should be provided.
- (d) Areas for the storage of fuel and other flammable materials shall comply with standard fire safety regulations.
- (e) The location of the fuel and chemical depot(s) shall be located at least 100 m from any surface water body.
- (f) See also the Environmental Specification for the handling and storage of materials.
- (g) Fuels (Petrol and Diesel) and Oil:
 - Unless specifically authorised, fuel shall not be stored on site, but shall be transported to the site as and when required.
 - Where fuel is to be stored on site, all necessary approvals regarding storage and dispensing shall be obtained from the appropriate authorities.
 - The location of the fuel storage area shall be approved by the PM and ECO.
 - The Contractor shall ensure that all liquid fuels and oils are stored in tanks with lids and that these are kept firmly shut and locked at all times. The design and construction of the storage tanks shall be in accordance with a recognised code and as approved by the PM.
 - The tanks shall be situated in a bunded area that has a volume of at least 110% of the volume of the largest tank. The floor of the bunded area shall be constructed as per the Environmental Specification.
 - All storage tanks are to be designed and constructed in accordance with a recognised code.
 - Storage tanks are to be removed on completion of the works.
 - No smoking shall be allowed in the vicinity of the fuel storage area.
 - There shall be adequate fire fighting equipment at the fuel storage and dispensing area or areas.
 - Fuel shall be kept under lock and key at all times.
 - Where reasonably practical, plant shall be refuelled at a petrol station. If it is not reasonably practical then the surface under the temporary refuelling

area shall be protected against pollution to the reasonable satisfaction of the PM prior to any refuelling activities, as per the Environmental Specification.

- The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb/break down any spilled fuel and where possible is designed to encapsulate minor hydrocarbon spillage. The quantity of such materials shall be able to handle a minimum of 200ℓ of hydrocarbon liquid spill. This material must be approved by the PM prior to any refuelling or maintenance activities.
- In the case of a spill, contaminated material is to be immediately removed from the site and disposed of at the appropriate hazardous waste facility.

(h) Hazardous Substances

- If potentially hazardous substances are to be stored on site, the Contractor shall provide a Method Statement detailing the substances/materials to be used together with the procedures for the storage, handling and disposal of the materials in a manner which will reduce the risk of pollution that may occur from day to day storage, handling, use and/or from accidental release of any hazardous substances used.
- Hazardous chemical substances used during construction shall be stored in secondary containers.
- The relevant Material Safety Data Sheets (MSDS) shall be available on site. Procedures detailed in the MSDS shall be followed in the event of an emergency situation.

4.4.9 Solid Waste Management

- (a) The site is to be kept clean, neat and tidy at all times.
- (b) No burning, burying or dumping of any waste materials, vegetation, litter or refuse shall be permitted
- (c) The Contractor will be required to prepare and submit a Method Statement on waste control and management at the site. At a minimum, the Contractor shall include the following in the Method Statement:
 - The provision of sufficient bins (preferably vermin and weather proof) at the camp and work sites to store the solid waste produced on a daily basis.
 - The collection of refuse and waste generated by his staff on a daily basis.
 - The final disposal of the site waste at an approved landfill site, or at a site as approved by the PM and ECO.
 - Wherever possible, materials used or generated by construction shall be recycled.
 - Provision for responsible management of any hazardous waste generated during the construction works.

4.4.10 Sanitation

- (a) Adequate washing and toilet facilities are to be provided at the construction site camp.

- (b) Portable chemical toilets at a ratio of one toilet per 15 workers shall be provided at the site camp.
- (c) Portable toilets must be at least 50 meters from any water bodies.
- (d) All temporary/portable toilets shall be secured to the ground to the satisfaction of the PM to prevent them from toppling over or being blown over.
- (e) The type and exact location of the toilets shall be approved by the PM prior to establishment. No septic tanks or pit latrines are to be established.
- (f) The Contractor shall ensure maintenance of all toilets in a clean sanitary condition to the satisfaction of the PM. Toilets are to be serviced once a week and water, soap and toilet paper shall be provided.
- (g) The Contractor shall ensure that no spillage occurs when the toilets are cleaned or emptied and that the contents are removed from the site to an appropriate location/facility. The toilet Contractor is to provide proof that the toilet contents are disposed of at an appropriate facility.
- (h) Discharge of waste from toilets into the environment and burial of toilet waste is strictly prohibited.

4.4.11 Wastewater and Contaminated Water Management

- (a) No grey water runoff or uncontrolled discharges from the site/working areas (including wash down areas) to adjacent watercourses and/or water bodies shall be permitted.
- (b) The Contractor shall prepare a Method Statement on the control and management of wastewater and/or contaminated water on site – including providing for the appropriate disposal of contaminated water (particularly where this may be contaminated by hydrocarbon and hazardous materials).
- (c) Water containing such pollutants as cements, concrete, lime, chemicals and fuels shall be discharged into a conservancy tank for removal from site. This particularly applies to water emanating from concrete batching plants and concrete swills.
- (d) The Contractor shall also prevent runoff loaded with sediment and other suspended materials from the site/working areas from discharging to adjacent watercourses and/or stormwater infrastructure.
- (e) Potential pollutants of any kind and in any form shall be kept, stored and used in such a manner that any escape can be contained.
- (f) Wash areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas are not polluted.
- (g) The Contractor shall notify the PM and ECO of any pollution incidents on site.

4.4.12 Stormwater Management and Erosion Control

- (a) Any evidence of water related erosion should be addressed as per the Environmental Specification.
- (b) The Contractor shall take reasonable measures to control storm water and the erosive effects thereof and shall provide a Method Statement for approval by the PM.
- (c) During construction the Contractor shall protect areas susceptible to erosion by installing necessary temporary and permanent drainage works as soon as possible and by taking measures to prevent the surface water from being concentrated in streams and from scouring slopes, banks or other areas.
- (d) Areas affected by construction related activities and/or susceptible to erosion must be monitored regularly for evidence of erosion.

- (e) On any areas where the risk of erosion is evident, special measures may be necessary to stabilise the areas and prevent erosion. These may include, but not be restricted to:
- Confining construction activities.
 - Using cut-off berms.
 - Using mechanical cover or packing structures such as geofabric to stabilise steep slopes or hessian, gabions and mattress and retaining walls.
 - Straw stabilising.
 - Brush cut packing.
 - Constructing anti-erosion berms.
- (f) The erosion prevention measures must be implemented to the satisfaction of the PM and ECO.
- (g) Where erosion does occur on any completed work/working areas, the Contractor shall reinstate such areas and areas damaged by the erosion at his own cost and to the satisfaction of the PM and ECO.
- (h) Traffic and movement over stabilised areas shall be restricted and controlled. Any damage to the stabilised areas shall be repaired and maintained to the satisfaction of the PM and ECO.
- (i) The Contractor shall be liable for any damage to downstream property caused by the diversion of overland storm water flows.

4.4.13 Air Emissions and Odour Control

- (a) The Contractor will be required to ensure that all vehicles and plant used are maintained in good working order to help reduce air emissions.
- (b) Exhaust emission control devices are to be installed on vehicles and/or machinery where practical.

4.4.14 Noise Control

- (a) The Contractor shall keep noise level within acceptable limits. The Contractor shall comply with all relevant guidelines and regulations.
- (b) All vehicles and machinery shall be fitted with appropriate silencing technology that shall be properly maintained.
- (c) The use of all plant and machinery shall be appropriate to the task required in order to reduce noise levels and/or environmental damage.
- (d) Any complaints received by the Contractor regarding noise will be recorded and communicated to the PM and ECO.

4.4.15 Dust Control

- (a) The Contractor shall be responsible for the control of dust arising from his operations and activities.
- (b) Control measures shall include regular spraying of working/exposed areas with water at an application rate that will not result in soil erosion or runoff. The frequency of spraying will be agreed with the PM.
- (c) The excavation, handling and transport of erodible materials shall be avoided under high wind conditions.
- (d) Soil stockpiles shall be wetted and/or sheltered from the wind with a cover.

4.4.16 Fire Prevention and Control

- (a) The Contractor shall take all reasonable and precautionary steps to ensure that fires are not started as a consequence of his activities on site.
- (b) The Contractor shall ensure that there is basic fire-fighting equipment available on site.
- (c) Flammable materials should be stored under conditions that will limit the potential for ignition and the spread of fires.
- (d) Smoking shall not be permitted in those areas where there is a fire hazard. These areas shall include:
 - Fuel storage areas.
 - Any areas where vegetation or other material is such as to make likely the rapid spread of an initial flame.
- (e) The Contractor shall hold fire prevention talks with staff to create an awareness of the risks of fire.

4.4.17 Emergency Procedures

- (a) Specific to accidental leaks and spillages:
 - The Contractor shall ensure that his employees and Sub-Contractors on site are aware of the procedure for dealing with spills and leaks.
 - The Contractor shall also ensure that the necessary materials and equipment for dealing with the spills and leaks are available on site at all times.
- (b) Specific to hydrocarbon spills:
 - The site shall have a supply of absorbent material readily available to absorb any emergency hydrocarbon spills, and where possible be designed to encapsulate minor hydrocarbon spillage. The quantity of such material shall be able to deal with a minimum of 200 litres of spill.
 - The Contractor shall contain the spill using sand berms, sandbags, pre-made booms, sawdust or absorbent materials.
 - The area shall be cordoned off and secured.
 - The Contractor shall notify the ECO, PM and relevant authorities of any spills that occur.
 - The treatment and remediation shall require method statements.
- (c) The Contractor shall assemble and clearly list the relevant emergency telephone contact numbers for staff and brief staff on the required procedures. These contact details shall be listed in Xhosa and English in the site office, construction camp and any other suitable areas.
- (d) The treatment and remediation of areas affected by emergencies shall be undertaken to the reasonable satisfaction of the PM and ECO at the cost of the Contractor where his staff have been proven to be responsible for the emergency.

4.5 Construction Activities

4.5.1 Mortar and Concrete Batching

- (a) If required, a concrete batching plant should be erected on a site approved by the engineer and ECO.
- (b) Concrete and mortar shall not be mixed directly on the ground. Mixing trays, wheelbarrows or concrete mixing machines can be used.
- (c) The mixing works shall be kept neat and clean at all times.
- (d) Contaminated stormwater and wastewater runoff from the batching plant and aggregate stockpiles shall be led to a pit where the water can soak away, or be tinkered off the site.
- (e) Used cement bags must be stored tidily in weatherproof containers until disposal. Unused cement bags must be stored weatherproof to prevent leaching of cement.
- (f) Used cement bags shall be disposed of off-site and are not to be incinerated on site.
- (g) All reasonable measures must be taken to ensure that transportation of concrete does not result in spillage.
- (h) Cleaning of equipment and flushing of mixers shall not result in pollution of the surrounding environment.
- (i) Suitable screening and containment shall be in place to prevent windblown contamination associated with any loading and batching.
- (j) Waste concrete and cement sludge and mortar leftovers shall be scraped off and be removed to an approved landfill site. Washing the remains into the ground is not acceptable.

4.5.2 Asphalt and Bitumen

During the application of bitumen products, the following shall apply:

- (a) Over spray of bitumen products outside of the road surface and onto roadside vegetation shall be prevented using a method approved by the PM.
- (b) When heating bitumen products, only LPG or a similar zero emission fuel shall be used and the Contractor shall take cognisance of appropriate fire risk controls.
- (c) Stone chip/gravel excess shall not be left on road/paved area verges. This shall be swept or raked into piles and removed to an area approved by the PM.
- (d) Milled or cut out bitumen shall be removed to an area approved by the PM.
- (e) Water quality from runoff from newly/fresh bitumen surfaces shall be monitored by the PM and remedial actions taken where necessary.

4.5.3 Community matters

- (a) Site infrastructure and equipment should be positioned in such a way as to limit visual intrusion on neighbours
- (b) Lighting should be positioned so as not to interfere with road traffic or disturb the surrounding community
- (c) A Community complaints register should be made available on site
- (d) Fence removal and re-instatement should be conducted in close consultation with the land owners to prevent damage to property and potential loss of live-stock.

4.5.4 Work stoppage and temporary site closure

- (a) The Engineer shall have the right to order work to be stopped in the event of significant infringements of the Project Environmental Specifications until the situation is rectified in compliance with the specifications. In this event, the Contractor shall not be entitled to claim for delays or incurred expenses.

4.5.5 Heritage Resources

An Archaeological Impact Assessment undertaken by Karen van Rynerveld (Archaemaps), identified four (4) late Iron Age homesteads situated at 32°12'58.1" S and 28°12'39.5" E as indicated in Figure 2.



Figure 2: Location of the late iron homestead located in the eMambabala village.

The iron age homesteads will not be impacted on by development, but additional conservation measures would be required:

1. Formal conservation measures (permanent fence with access gate) should be pre-negotiated with the community.
2. Alternatively the proponent should ensure that temporary conservation measures (temporary fence and signage) are in place for the tenure of construction
3. Temporary conservation measures should be removed after construction.

Where heritage resources are discovered (e.g. burial sites, archaeological and paleontological artefacts) during construction the following will apply:

- 1 Work at the point of the discovery is to cease, and may not recommence until such time as guidance from the South African Heritage Resources Agency (SAHRA) has been received.
- 2 The point of discovery is to be clearly demarcated.
- 3 The SAHRA is to be informed within 24 hours of the discovery.

4.5.6 Rehabilitation

- (a) Rehabilitation shall be required for all specified areas disturbed by the works and site camp.
- (b) Rehabilitation shall ensure that all specified areas disturbed by the works are returned to a similar or better state than before the construction works commenced.
- (c) The Contractor shall rehabilitate all disturbed areas to the satisfaction of the PM and the ECO.
- (d) The Contractor shall implement a programme of progressive rehabilitation, i.e. once works are complete in particular areas, rehabilitation and/or re-vegetation could begin.
- (e) A programme of progressive rehabilitation will provide an opportunity to assess whether or not the methods employed are suitable and successful. Where rehabilitation of an area is not successful, the Contractor will rehabilitate these areas at no additional cost to the Developer.
- (f) Rehabilitation includes, but is not limited to, the following activities:
- (g) Clearance of rubble associated with construction, including removal of surplus materials, excavation and disposal of consolidated waste concrete and concrete wash water, litter etc.
- (h) Removal of all soil/sand contaminated by hydrocarbons by excavation to the depth of contaminant penetration and removal to an appropriate landfill site.
- (i) Backfilling and contouring using stockpiled subsoil removed during site clearing.
- (j) Finishing and grading of final levels of all disturbed areas shall be consistent with the master plan for the site.
- (k) Rehabilitation of all drainage lines affected by construction to approximately their original profile. Where this is not feasible due to technical constraints, the profile is to be agreed upon by the PM.
- (l) Ripping along the contour of compacted disturbed areas, including stockpile areas, to a depth of 150 mm prior to the replacement of top soils, except where otherwise specified by the PM.
- (m) The eradication of young invasive/alien species that may have grown up during the construction period in impacted and rehabilitated areas.

4.6 Monitoring

4.6.1 Obligations of the parties

- (a) The Contractor shall inspect the site on a daily basis to ensure that the environmental specifications are adhered to.
- (b) The Contractor shall provide the PM with a verbal report, on a weekly basis, detailing both compliance with the EMP as well as environmental performance.

- (c) The Contractor shall maintain a record of incidents (spills, impacts, complaints, legal transgressions, etc.) as well as corrective and preventive actions taken, for submission to the PM at the scheduled project meetings.
- (d) The ECO shall conduct audits to ensure that the system for implementation of the EMPr is operating effectively. The audit shall check that a procedure is in place to ensure that:
 - The EMPr and the Method Statements being used are the up to date versions.
 - Variations to the EMPr, Method Statements and non-compliances and corrective actions are documented.
 - Emergency procedures are in place and effectively communicated to personnel.

4.6.2 Audit schedule

The audit programme shall consist of the following at a minimum:

- (a) First audit no later than 1 month after construction commences;
- (b) Thereafter audits at monthly intervals; and
- (c) A post construction audit within 1 week after the Contractor has declared the completion of works.

4.6.3 Compliance with the EMPr

The Contractor and/or his agents are deemed not to have complied with the EMPr and remedial action if:

- (a) Within the boundaries of the site or extensions there is evidence of contravention of the EMPr clauses.
- (b) Environmental damage ensues due to negligence.
- (c) The Contractor fails to comply with corrective or other instructions issued by the PM, within a time period specified by the PM.

4.6.4 Tolerances

- (a) Environmental management is concerned not only with the final results of the Contractor's operations to carry out the works, but also with the control of how those operations are carried out.
- (b) Tolerance with respect to environmental matters applies not only to the finished product but also to the standard of the day-to-day operation required to complete the Works.
- (c) It is thus required that the Contractor shall comply with the environmental requirements on an ongoing basis and any failure on his part to do so will entitle the PM to certify the imposition of a penalty subject to the details set out.

4.6.5 Penalties

- (a) Penalties will be issued for the transgressions and non-compliances where the Contractor inflicts non-repairable damage upon the environment or fails to comply with any of the environmental specifications. The Contractor shall be liable to pay a penalty over and above any other contractual consequence.
- (b) Penalties may be issued per incident at the discretion of the PM. The exact value of the penalty imposed shall be at the discretion of the PM and enforcement shall

be at the discretion of the Developer. The Contractor will also be responsible for remediation costs.

- (c) Such fines will be issued in addition to any remedial costs incurred as a result of non-compliance with the EMPr. The PM will inform the Contractor of the contravention and the amount of the penalty, and will deduct the amount from monies due under the Contract.
- (d) The PM shall be the judge as to what constitutes a transgression in terms of this clause subject to the provisions of the General Conditions of Contract. In the event that transgressions continue, the Contractor's attention is drawn to the provisions of the General Conditions of Contract, under which the PM may cancel the Contract.
- (e) For each subsequent similar offence, the penalty may, at the discretion of the PM be doubled in value to a maximum value to be determined by the PM.
- (f) Payment of any penalty in terms of the contract shall not absolve the offender from being liable from prosecution in terms of any law.

Typical Incidents incurring penalties	Value
Failure to stockpile topsoil correctly inside demarcated areas	R 500.00
Failure to stockpile materials in designated areas	R 500.00
Insufficient education of staff regarding environmental matters and site housekeeping practices	R 500.00
Persistent and un-repaired oil leaks from machinery. The use of inappropriate methods of refuelling.	R 500.00
Failure to provide drip trays and/or empty them frequently	R 500.00
Not making use of the site ablution facilities.	R 500.00
Dust or excess noise on or emanating from the site.	R 500.00
Any person, vehicle, item of plant, or anything related to the Contractor's operations causing a public nuisance	R 500.00
Improper use of plant or equipment	R 500.00
Construction vehicles not adhering to speed limits	R 500.00
Failure to demarcate working servitudes and/or maintain demarcation tape.	R 1,000.00
Untidiness and litter at camp	R 1,000.00
Failure to provide adequate sanitation, waste disposal facilities or services.	R 1,000.00
Failure to demarcate "No-go" Areas before commencing construction clearance and other activities	R 1,000.00
Inappropriate mixing of cement/concrete and poor management of slurry	R 1,000.00
Failure to reinstate disturbed areas within the specified timeframe.	R 1,000.00
Failure to provide equipment for emergency situations	R 1,000.00
Failure to maintain basic safety measures on site	R 1,000.00
Failure to obey site protection measures specified by the PM.	R 1,000.00
Inappropriate use of bins and poor waste management on site	R 1,000.00
Inappropriate offsite disposal of waste from site	R 1,000.00
Failure to maintain a register of incidents on site	R 1,000.00
Any contravention with Method Statement	R 1,000.00
Any contravention of the environmental and health and safety specification.	R 1,000.00
Failure to submit Method Statements timely	R 2,000.00
Failure to secure construction site from public access.	R 2,000.00
Hunting or removing any organism from nature reserve or marine reserve	R 2,000.00
Pollution of natural water bodies – including increased suspended solid loads.	R 5,000.00
Causing fire through negligence.	R 5,000.00
Failure to remove all temporary features and leftovers from the construction site and works areas upon completion of the works.	R 10,000.00

4.7 Completion of contract and decommissioning of the site

4.7.1 Completion of contract

- (a) The Contractor is to timely notify the PM of the impending completion of the works to provide an opportunity to identify work outstanding or incomplete. The PM is to timely inform the ECO of contract completion so that a final audit can be arranged.

4.7.2 Measurement and payment

- (a) Unless otherwise stated, no separate measurement and payment will be made to cover the costs of complying with the provisions of this EMPr and such costs shall be deemed to be covered by the rates tendered for the items in the Schedule of Quantities completed by the Contractor when submitting his tender.
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4.8 Operational phase

4.8.1 Accident prevention

- (a) All traffic calming infrastructure, signage and road markings must be marked and erected before any road lane is opened for traffic.
- (b) The Contractor shall ensure that the newly tarred road is swept clean of debris before any road lane is opened for traffic.
- (c) The Contractor shall ensure that manhole covers and grids of the newly constructed stormwater infrastructure are in place and secured to prevent harm for road users before any road lane is opened for traffic.

DOCUMENT CONTROL SHEET (FORM IP180/B)

CLIENT : SANRAL
PROJECT NAME : N2 Gonubie Interchange to Brakfontein Interchange **PROJECT No.** : J30137
TITLE OF DOCUMENT : Draft EMPr Qhora
ELECTRONIC LOCATION : P:\J30137 N2 Gonubie interchange to Brakfontein interchange\3- Tasks\Environmental\N2 Access Roads Working Folder\BARs N2 intersections\Qhora\Report\Draft EMPr Qhora.docx

	Approved By	Reviewed By	Prepared By
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DATE 02 May 2013	SIGNATURE 	SIGNATURE 	SIGNATURE 

	Approved By	Reviewed By	Prepared By
REVISION	NAME	NAME	NAME
DATE	SIGNATURE	SIGNATURE	SIGNATURE

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