

Environment Management Programme

Improvement of National Route 2 Section 18
Between Sitebe Komkhulu and Viedgesville
Eastern Cape

The South African National Roads Agency Limited
(SANRAL)



Report Number 2010-R377

PUBLIC DRAFT

June 21, 2010



Biotechnology & Environmental Specialist Consultancy cc

PO Box 8241, Nahoon, 5210, East London, South Africa
9 Douglas Road, Vincent, 5247, East London, South Africa
Telephone 043 726 4242; Facsimile: 043 726 3199
E-mail: info@besc.co.za; Website: <http://www.besc.co.za>

Prepared on behalf of

**The South African National Roads Agency Limited
(SANRAL)**



by

Biotechnology and Environmental Specialist Consultancy cc

PO Box 8241, Nahoon, 5210, East London, South Africa
9 Douglas Road, Vincent, 5247, East London, South Africa

Telephone 043 726 4242; Facsimile: 043 726 3199

E-mail: info@besc.co.za; Website: <http://www.besc.co.za>

CONTENTS

1	Report Release Notice	7
2	Limitations	8
3	Limiting Conditions	8
4	Special Conditions	8
5	Natural Science Professions Act	9
6	Legislative Specifications	9
7	Abbreviations	9
8	Introduction	10
9	Environmental Management Programmes	10
9.1	Planning Phase	10
9.2	Construction Phase	11
10	Responsibilities of the Role Players	11
10.1	Developer (SANRAL)	11
10.2	Consulting Engineer	11
10.3	Contractor	11
10.4	Environmental Control Officer (ECO)	11
10.5	Environmental Liaison Officer (ELO)	12
11	Environmental Management Plan (EMP) - Construction Phase	13
11.1	Implementation of the Construction EMP	13
11.1.1	The Contractor	13
11.1.2	Environmental Compliance by Contractors & Sub-contractors	13
11.1.3	Environmental Reporting Procedures	13
11.1.4	Environmental Awareness Training/Induction	13
11.2	Construction EMP	14
11.2.1	Objective	14
11.2.2	Environmental Impact Fine Structure	14
11.2.3	Environmental Control Officer	14
11.2.4	Construction Camps and Laydown Areas	14
11.2.5	Stop-and-Go's	15
11.2.6	Vegetation Clearance	15
11.2.7	Topsoil Management	16
11.2.7.1	Topsoil stripping	16
11.2.7.2	Soil stockpiling	17
11.2.8	The Buwa and Mbulo Rivers	17
11.2.9	Water abstraction	18
11.2.10	Soil Erosion	18
11.2.11	Revegetation	19
11.2.12	Housekeeping	19
11.2.13	Waste Management	19
11.2.14	Pollution Control	20
11.2.15	Wastewater	21
11.2.16	Batching Plants	21
11.2.17	Air Quality	22
11.2.18	Noise Quality	22
11.2.19	Visual Quality	23

11.2.20	Fire Risk and Burning.....	23
11.2.21	Heritage, Archaeology & Palaeontology.....	23
11.2.22	Public Interaction.....	24
11.2.23	Site Closure.....	24
11.3	DEDEA - Environmental Authorization.....	24
12	Plant Rescue and Translocation Programme.....	25
13	Appendix A: EMP Assessment Checklist.....	26
14	Appendix B: Environmental Incidents Register.....	31
15	Appendix C: Contractors Training Record.....	32
16	Appendix D: Environmental Code of Conduct.....	33

1 Report Release Notice

<i>Report Status</i>	<i>Date</i>	<i>Authorised</i>
1. Internal Draft	April 07, 2010	Mr. Conroy van der Riet
2. Client Draft	April 15, 2010	Ms Lee-Anne Proudfoot
3. Public Draft	June 21, 2010	Dr. Malcolme Logie
4. DEDEA Draft		Dr. Malcolme Logie
5. Final Report		

This report has been prepared by BESC the trading name of Biotechnology & Environmental Specialist Consultancy cc, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporating our Standard Terms and Conditions of Business and taking account of the resources devoted to it by agreement with the client.

BESC disclaims any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such persons or parties rely on the report at their own risk.

2 Limitations

BESC has prepared this report for the sole use of **The South African National Roads Agency Limited (SANRAL)** in accordance with generally accepted consulting practises and for the intended purposes as stated in the agreement under which this work was completed. This report may not be relied upon by any other party without the explicit written agreement of **The South African National Roads Agency Limited (SANRAL)** and **BESC**. No other warranty, expressed or implied, is made as to the professional advice included in this report.

The conclusions and recommendations contained in this report are based upon information provided by others and the assumption that all relevant information has been provided by those bodies from whom it has been requested. Where field investigations have been carried out, they have been restricted to a level of detail required to achieve the stated objectives of the work.

All items listed in BESC's Standard Terms and Conditions of Business are applicable to this report.

3 Limiting Conditions

This report was compiled from information obtained from the following sources:

1. Basic Environmental Impact Assessment Report: BESC Report 2010-R373 - BA - N2: Section 18 - SANRAL
2. Numerous site assessments
3. Interviews and discussions with select management representatives.

4 Special Conditions

1. None

5 Natural Science Professions Act

The Principal of BESC, Dr Malcolme Logie, is registered with the:

- South African Council for Natural Scientific Professions (SACNASP), in accordance with the Natural Sciences Professions Act (Act 27 of 2003), as a *Professional Natural Scientist - Environmental Scientist*. As such work undertaken by BESC in Environmental Management complies with the requirement of the Act, which states, “*only individuals registered may practice in a consulting capacity.*”
- The South African Institute of Ecologist & Environmental Scientist, and is registered as a *Professional Member - Environmental Scientist*.
- Certification Board of the Environmental Assessment Practitioners of South Africa (EAPSA), as a *Certified Environmental Assessment Practitioner*
- International Association of Impact Assessors - South Africa
- Senior Lead Auditor: Bureau Veritas (Safety, Health, Environment & Quality)
- Lead Auditor: TUV (Safety, Health, Environment)
- Lead Auditor: British Standard Institute (Safety, Health, Environment)

6 Legislative Specifications

Primary Environmental Legislation governing the Scope of Work undertaken for the preparation of this Report is:

1. The regulations in terms of chapter 5 of the National Environmental Management Act, 1998.

7 Abbreviations

- BESC - Biotechnology & Environmental Specialist Consultancy cc
- DEDEA - Department of Economic Development & Environmental Affairs
- DWA - Department of Water Affairs
- ECO - Environmental Control Officer
- ELO - Environmental Liaison Officer
- EMP - Environmental Management Plan
- IEM - Integrated Environmental Management
- RoD - Record of Decision
- SAHRA - South African Heritage and Resource Agency
- SSC - Species of Special Concern

8 Introduction

BESC were appointed by Aurecon on behalf of The South African National Roads Agency Limited (SANRAL) as Independent Environmental Consultants for the preparation of a Basic Assessment Report & Environmental Management Plan Report as defined and required by the EIA Regulations published in the Government Gazette 28753 dated 21 April 2006 for the proposed upgrading of the National Road 2 between Sitebe Komkhulu and Viedgesville located near Mthatha, to a standard cross section with 2 x 3,7m lanes and 2 x 3m shoulders and a 0,5m rounding for a total formation width of 14,4m.

This EMP is applicable to the construction phase of the proposed Improvement of National Road 2 between Sitebe Komkhulu and Viedgesville, Eastern Cape.

It is also appropriate to highlight at this point that the Department of Environmental Affairs may, in their Record of Decision, reserve their rights to initiate criminal proceedings against the consulting engineer, contractor and/or any sub-contractors.

9 Environmental Management Programmes

It is generally understood that any development can pose various risks to the environment as well as the inhabitants in the surrounding area. These possible risks should be taken into account during the planning phase of the development. The purpose of this document is to provide management responses that shall ensure that the impacts of the development are minimised. This EMP shall be used on the site during each phase of the development (planning and construction).

This EMP should provide some flexibility so as to allow the contractor, site engineer and developer to conform to the management commitments without being overly prescriptive. The onus set out in the EMP rests with the developer, appointed engineer, the primary contractor and subcontractors. Any parties responsible for transgression of the underlying management measures outlined in this document shall be held liable for non-compliances and shall be disciplined as described herein.

The Record of Decision issued in favour of the development by DEDEA applies the principle of Integrated Environmental Management (IEM). The purpose of this EMP is to formulate mitigation measures that should be made binding on all contractors during the construction phase.

The point of departure for this EMP is to take a pro-active route by addressing potential problems before they occur. This should limit corrective measures required during the construction phase of the development. In particular, this EMP deals with the following phases as detailed below:

9.1 Planning Phase

The EMP offers an ideal opportunity to incorporate pro-active environmental management measures with the goal of attaining sustainable development. Pro-active environmental measures minimize the chance of impacts taking place during the construction and operational phase. There remains the possibility of accidental and incidental impacts occurring, however,

through the incorporation of contingency plans (i.e. this EMP) during the planning phase, the necessary corrective action can be taken to further limit potential impacts.

9.2 Construction Phase

The bulk of the impacts during this phase shall have immediate effect (e.g. noise, dust and water pollution). If the site is monitored on a continual basis during this phase, it is possible to identify these impacts as they occur. These impacts shall then be mitigated through the contingency plans identified in the planning phase, together with a commitment to sound environmental management from the developer.

10 Responsibilities of the Role Players

10.1 Developer (SANRAL)

The developer remains ultimately responsible for ensuring that the development is implemented according to the requirements of the EMP. The developer is responsible for ensuring that sufficient resources (time, financial, human, equipment, etc.) are available to the other role players (e.g. the ECO, ELO and contractor) to efficiently perform their tasks in terms of the EMP. The developer is liable for restoring the environment in the event of negligence leading to damage to the environment. The developer shall ensure that the EMP is included in the tender documentation so that the contractor who is appointed is bound to the conditions of the EMP. The developer shall appoint an independent Environmental Control Officer (ECO) during the planning phase to oversee all the environmental aspects relating to the development.

10.2 Consulting Engineer

The Consulting Engineer, is bound to the EMP conditions through his/her contract with the developer, and is responsible for ensuring that she/he adheres to all the conditions of the EMP. The Consulting Engineer shall thoroughly familiarise him/herself with the EMP requirements before coming onto site and shall request clarification on any aspect of these documents, should they be unclear.

10.3 Contractor

The Contractor, as the developer's agent on site, is bound to the EMP conditions through his/her contract with the developer, and is responsible for ensuring that she/he adheres to all the conditions of the EMP. The Contractor shall thoroughly familiarise him/herself with the EMP requirements before coming onto site and shall request clarification on any aspect of these documents, should they be unclear. The Contractor shall ensure that he/she has provided sufficient budget for complying with all EMP conditions at the tender stage. The Contractor shall comply with all orders (whether verbal or written) given by the ECO via the Contract Engineer in terms of the EMP.

The Department of Environment Affairs have reserved their rights to initiate criminal proceedings against the Consulting Engineer, contractor and/or any sub-contractors.

10.4 Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is appointed by the Developer/Consulting Engineer as an independent monitor of the implementation of the EMP. He/she shall form part of the project team and shall be involved in all aspects of project planning that can influence environmental conditions on the site. The ECO shall attend agreed relevant project meetings,

conduct inspections to assess compliance with the EMP and be responsible for providing feedback on potential environmental problems associated with the development. In addition, the ECO is responsible for:

- Liaison with relevant authorities;
- Liaison with contractors regarding environmental management; and
- Undertaking routine monitoring and appointing a competent person/institution to be responsible for specialist monitoring, if necessary
- The ECO has the right to enter the site and undertake monitoring, auditing and assessment at any time, with the agreement of the Contractor, which agreement shall not be unreasonably withheld.

The ECO shall be responsible for liaising with the DEDEA. The ECO shall submit quarterly environmental audit reports to the authorities. These audit reports shall contain information on the contractor and developer's levels of compliance with the EMP. The audit report shall also include a description of the general state of the site, with specific reference to sensitive areas and any matters of non-compliance. The ECO is to suggest corrective action measures to eliminate the occurrence of the non-compliance incidents. In order to keep a record of any non-compliance, an Environmental Incident Record (Appendix B) shall be kept.

10.5 Environmental Liaison Officer (ELO)

The contractor shall appoint an Environmental Liaison Officer (ELO) to assist with day-to-day monitoring of the construction activities. Any issues raised by the ECO shall be routed through the contract engineers' site staff to the ELO for the contractors' attention. The ELO shall be *permanently* on site during the construction phase to ensure daily environmental compliance with the EMP and shall be ideally be a senior member of the contractor's management team. The ECO shall be responsible for ensuring that all staff members are adequately trained and aware of the EMP. The ECO shall be responsible for undertaking monthly environmental inspections (according to the criteria specified in the EMP), and accompany the ELO during site visits, audits or assessments.

The ECO shall be notified of this appointment and furnished with the contact details of the ELO.

11 Environmental Management Plan (EMP) - Construction Phase

The following tables form the core of this EMP for the planning and construction phases of the development. These tables should be used as checklists on site, especially during the construction phase. Compliance with this EMP shall be audited monthly during the construction phase and once immediately following completion of construction. This shall be followed up with an audit one year after the completion of the construction phase.

11.1 Implementation of the Construction EMP

11.1.1 The Contractor

- The primary responsibility for ensuring compliance lies with the Contractor.
- The Contractor shall ensure that all staff members, sub-contractors and suppliers understand and adhere to the EMP.
- The Contractor shall ensure that all sub-contractors and suppliers are contractually bound to adhere to the EMP.

11.1.2 Environmental Compliance by Contractors & Sub-contractors

- The Contractor/Sub-contractor shall be deemed not to have complied with the EMP if:
- There is evidence of negligence or recklessness resulting in the contravention of any of the clauses both within and outside the route.
- The Contractor/Sub-contractor fails to comply with corrective or other instructions by the ECO via the contract engineers' site staff within any time specified.

11.1.3 Environmental Reporting Procedures

- An Environmental Incidents Register and an Environmental Complaints Register shall be in place and shall be maintained by the ELO (Appendix B).
- Upon occurrence of a non compliance or a complaint of an environmental nature the incident shall be recorded in the relevant register.
- The registers shall be made available to the ECO upon every site visit.
- EMP related issues shall be discussed at all construction site meetings.
- A copy of the relevant sections of the minutes of these site meetings shall be made available to the ECO.

11.1.4 Environmental Awareness Training/Induction

- The ELO shall be responsible for putting in place an Environmental Awareness Training Programme for all staff members. The training programme has to be approved by the ECO.
- Before commencing with any work, all staff members shall attend the Environmental Awareness Training Programme.
- After attending the Environmental Awareness Training Programme, all contractors and sub-contractors shall sign the Environmental Training register as proof of their training (Appendix C).

11.2 Construction EMP

The EMP outlines measures to be implemented in order to minimise any potential environmental degradation. It should serve as a guide for the Contractor and the construction workforce on their roles and responsibilities concerning environmental management on the construction site and provide a framework for environmental monitoring throughout the construction period. Measures to control potential environmental impacts during the construction phase are specified. Except where otherwise stated, all these control measures shall apply throughout the construction period and, as part of the project contract, the Contractor shall adhere to these measures at all times.

11.2.1 Objective

- Prevent any adverse impacts upon the surrounding environment including the natural fauna, flora, air quality, soil quality and water quality.
- Minimise the ecological footprint of the upgrade process of the route on the surrounding environment.

11.2.2 Environmental Impact Fine Structure

Item	Rands (per item/incident)
Littering and poor housekeeping	250.00
Not maintaining/using waste bins/skips	1000.00
Spilling oil or diesel & not applying immediate clean-up measures	1000.00
Not maintaining/using chemical toilets	1000.00
Overstepping construction perimeter/laydown areas	1000.00
Causing deliberate erosion	1000.00
Damaging protected/demarcated plants	1000.00
Not maintaining dust suppression	1000.00
Presence of any degreasing agent on site.	2000.00
Illegal dumping of waste and/or rubble onsite and/or offsite	2000.00

The fines described above do not make provision for and shall not be used for any costs associated corrective action and/or rehabilitation. Furthermore such fines shall not be made available to cover any insurance and/or fines and/or costs related to any further punitive fines and/or costs by any authority or other legal actions (civil and/or criminal).

11.2.3 Environmental Control Officer

- An Environmental Control Officer (ECO) should be appointed prior to any construction activities commencing in order to ensure compliance with this Environmental Management Plan Report.

11.2.4 Construction Camps and Laydown Areas

Objectives

- To manage the construction camps and laydown areas in a manner that shall minimise the impact that construction activity shall have on the surrounding environment outside of the demarcated construction boundaries.

Management Activity

- Before commencing with construction, carefully plan the location of the construction activities and all workings. Construction camp and lay down areas shall be fenced off.
- Develop a Project Layout Plan to show the intended use of the area for each construction camp. The plan shall clearly indicate the boundaries of the construction camps, storage areas, lay down areas, no-go areas etc. Access roads to be used shall be defined.
- Construction camps should be provided with impermeable service areas for vehicles.
- Secure fuel storage facilities with impermeable and adequate bunding should be provided.
- Construction workforce shall undergo environmental awareness training
- All construction activities including establishment of the construction camp site, ablution facilities and stockpiles shall take place inside the agreed boundaries of the relevant sites. No activities shall be allowed outside the demarcated boundary.
- All ablution facilities shall be located at least 100 meters away from any river, stream or drainage line
- Rivers and streams shall not be used by staff for washing of equipment and/or clothes.
- Site clearance should be kept to a minimum.
- Feeding, catching, hunting or setting devices to trap or kill any wild animal shall not be allowed.
- Disturbances to bird nesting sites shall not be allowed.

11.2.5 Stop-and-Go's**Objectives**

- To minimise the amount solid waste & rubbish spread by road users at stop-and-go's.

Management Activities

- A suitable number of rubbish bins and litter fenced should be provided at stop-and-go's.
- Rubbish bins shall be provided with lids or netting to prevent waste from being disturbed by scavengers or being blown away by wind
- Signage should be provided at the stop-and-go's to encourage road users not to litter and use the rubbish bins provided.
- Staff manning the stop-and-go's must be given environmental awareness training and shall encourage road users to use the rubbish bins provided.
- Rubbish bins and litter fences shall be cleared and maintained on a regular basis.

11.2.6 Vegetation Clearance**Objectives**

- To minimise the amount of vegetation that is to be cleared.

Management Activities

- The Contractor shall work according to a plan, which demarcates area to be cleared.
- The minimum amount of vegetation clearance shall take place.
- All plants not interfering with construction should be left undisturbed.
- Collection, chopping down or wilful damage to any plant outside of the areas demarcated for clearing is not allowed.
- The Contractor shall take care of seeds collected during the removal of alien vegetation in order to counter the spread of this vegetation type. Failure to do so may result in prosecution in terms of the Conservation of Agricultural Resources Act, Act 43 of 1983, which states that any person removing any weed (which includes alien vegetation) shall

ensure that it is not able to reproduce itself. A fine not exceeding R5000 and/or 2 years imprisonment can be imposed.

11.2.7 Topsoil Management

Objectives

- To minimise the amount of topsoil lost during the construction phase and to ensure that what shall be removed is stockpiled correctly.

Management Activities

- Topsoil can only be stripped from the areas as indicated below:
 - Any area which is to be used for temporary storage of materials
 - Areas which could be polluted by any aspect of the construction activity and;
 - Areas designated for the dumping of soil.
- Stripping of topsoil shall be undertaken in such a manner as to minimise erosion by wind or runoff.
- Topsoil shall be stripped to a depth not exceeding 200mm from the original ground level unless otherwise specified by the Engineer in consultation with ECO.
- Areas from which the topsoil is to be removed shall be cleared of any foreign material which may come to form part of the topsoil during removal including bricks, rubble, any waste material, litter, excess vegetation and any other material which could reduce the quality of the topsoil.
- The Contractor shall ensure that subsoil and topsoil are not mixed during stripping, excavation, reinstatement and rehabilitation. If mixed with clay sub-soil the usefulness of the topsoil for rehabilitation of the site shall be lost.
- Soils should be exposed for the minimum time possible once cleared.
- Topsoil shall be temporarily stockpiled, separately from subsoil and rocky materials.
- Topsoil shall be stockpiled in the top soil designated storage areas.
- Soil shall not be stockpiled near drainage lines or watercourses without prior consent from the ECO.
- Stockpiles shall be protected to prevent erosion and invasion of weeds.
- Stockpiled topsoil shall not be compacted.
- Topsoil shall be used for rehabilitation of disturbed areas, especially old road sections.

11.2.7.1 Topsoil stripping

- Prior to the stripping of topsoil, as much as possible of the aboveground grass layer shall be removed and stockpiled. This is to be placed on top of the topsoil once the topsoil has been replaced and shall be stored separately from the topsoil. The purpose of using this vegetation material is that it contains grass seed and would therefore assist with re-establishment of the indigenous grasses that naturally occur in the area. Aside from this, the grass covering of the soil would also assist in preventing erosion prior to the re-establishment of a dense vegetation covering. Should insufficient grass covering be available to cover the soil, grass cuttings could be obtained from areas of natural grassland in the immediate vicinity of the particular area, with the consent of the affected landowner, or seeding is to be done as specified by the ECO.
- Topsoil shall be stripped from all areas that are to be utilised during the construction period and where permanent structures and access is required. Topsoil shall be stripped after clearing of woody vegetation and before excavation or construction commences.
- The presence of bulbous plants may only be discovered once topsoil is being removed. While topsoil is being stripped, it should be scanned for the presence of bulbous plants. Should bulbous plants be detected, they shall be removed from the topsoil and an

ecologist shall be contacted to provide advice on suitable habitats and methods for replanting.

- The topsoil is regarded as the top 200mm of the soil profile, unless there is a clearer shallower boundary between the topsoil and subsoil indicated by texture, colour or structure.
- No topsoil which has been stripped shall be buried or in any other way be rendered unsuitable for further use by mixing with spoil or by compaction using machinery.
- Topsoil shall preferably be stripped when it is in a dry condition in order to prevent compaction.

11.2.7.2 Soil stockpiling

- Stripped topsoil shall be stockpiled in areas, which have been approved by the Environmental Control Officer.
- Topsoil stripped from different soil zones shall be stockpiled separately and clearly identified as such. Under no circumstances shall topsoil obtained from different soil zones be mixed.
- Soil stockpiles shall not be higher than 2.5m. The slopes of soil stockpiles shall not be steeper than 1 vertical to 3 horizontal.
- No vehicles shall be allowed access onto the stockpiles after they have been placed. Topsoil stockpiles shall be clearly demarcated in order to prevent vehicle access and for later identification when required.
- Soil stockpiles shall not be allowed to become contaminated with oil, diesel, petrol, garbage or any other material that may inhibit the later growth of vegetation in the soil.
- After topsoil removal has been completed, the Contractor shall apply soil conservation measures to the stockpiles where and as directed by the Engineer or Environmental Control Officer. This may include the use of erosion control fabric or grass seeding.

11.2.8 The Buwa and Mbulo Rivers

Objectives

- To prevent any pollution and/or sedimentation of the Buwa & Mbulo Rivers.

Management Activities

- Site staff shall not be permitted to use the rivers and streams for the purpose of bathing, washing of clothing or as a water resource.
- The rivers and streams shall not be used for construction activities such as washing of equipment or the disposal of any type of waste.
- Water may not be abstracted from the rivers for any reason or use, unless authorised by the Department of Water Affairs.
- All fuel, chemical, oil storage areas shall be confined to areas at least 100 meters away from any watercourse and/or drainage line.
- Appropriate structures and methods to confine spillages such as the construction of berms and pans shall be used in order to prevent contamination of the rivers and streams.
- Adequate bank protection at all bridge and other structures that may alter the natural river bank must be provided. These include gabions, hydroseeding, berms, erosion blankets, etc.
- Appropriately designed temporary sediment traps should be constructed and installed downstream of bridges during the construction phase. The depth of the trap should be a maximum of 45cm for sediment accumulation, plus 60cm on top of that for settling

before overflowing the spillway. The side slopes of the sediment trap should not exceed a 3:1 ratio. The berm or embankment should be seeded or mulched to stabilize it and 1.5m in height as measured from the base of the stone outlet. This outlet is located at the low point and is comprised of aggregate stone or rip rap placed on top of a geotextile filter cloth. Sediment accumulated in the trap should be removed once the volume of sediment has reached the half full mark for the trap area in order to avoid excessive amounts of sediment accumulation.

11.2.9 Water abstraction

Objectives

- To ensure that any water abstraction is done lawfully and without any significant impact on the water resource.

Management Activities

- Water shall only be abstracted from the source/point approved by the Department of Water Affairs.
- Water abstraction should not commence prior to authorisation from the Department of Water Affairs.
- Daily monitoring should be conducted on the amount of water abstracted.
- Water use should be kept below the limits set by the Department of Water Affairs at all times. When the rivers are low during low rainfall periods the Department of Water Affairs must be consulted regarding reduced limits for abstraction.

11.2.10 Soil Erosion

Objectives

- To ensure that no erosion takes place on site that shall impact on the surrounding environment.

Management Activities

- Minimise the areas of disturbance or vegetation clearance.
- Revegetate areas that have been disturbed as soon as possible.
- Cut and fill slopes shall be made stable and be revegetated as soon as possible during the construction phase.
- All cut and fill slopes must be left as rough as possible to facilitate the accumulation of topsoil.
- Natural water flow paths must be identified (using riprap or superfluous rock material) or surface drains and chutes (use velocity reduction structures where appropriate), preferably using cemented natural rock, must be constructed along the flow paths.
- All areas where the slopes are 1:3 to 1:6 must be logged or otherwise stepped (using stabilisation cylinders or similar) in order to prevent soil erosion. Logs/ cylinders must be laid in continuous lines following the contours and spaced vertically 0.8-1.2 m apart, depending on the steepness of the slope. These logs/ cylinders must be secured by means of steel pegs and wire in rocky areas, and treated wooden pegs in other areas.
- Newly formed terraces within the site shall be vegetated in order to stabilise the soil.
- Areas where increased storm water runoff will be expected must be suitably stabilized with gabions (or similar velocity reducing structures). This is especially pertinent to areas of storm water release at the bottom of slopes and/or areas where water is released via any pipeline or conduit.
- Existing structures such as bridges & culverts shall be utilized (where possible) at drainage lines.

- Highly eroded areas must be avoided where possible, and where they cannot be avoided, should be rehabilitated or curbed by using gabions and/or clean quarry rocks.

11.2.11 Revegetation

Objective

- To introduce an indigenous mixed grass cover to the areas disturbed by construction activities

Management Activities

- All areas disturbed during construction shall be reinstated to a state that approximates or better the state that they were in before construction.
- All drainage deficiencies including abandoned pit latrines and waste pits shall be restored and reshaped.
- Cut and fill areas shall be restored, reshaped and revegetated as soon as possible.
- Areas compacted by vehicles during construction shall be scarified to allow penetration of plant roots and the regrowth of natural vegetation.
- The revegetation programme shall take cognisance of the climatic and seasonal conditions with the most favourable period being in spring and early summer.
- All areas disturbed by construction activities shall be kept clear of alien invasive plant species.

11.2.12 Housekeeping

Objectives

- The objectives shall be to ensure that sound housekeeping practices are enforced.

Management Activities

- The Contractor shall ensure that the working areas are kept clean and tidy at all times.
- The Contractor shall ensure that the workforce uses the designated toilets provided.
- All solid waste (including litter) shall be disposed of appropriately.
- The ELO shall inspect these areas on a daily basis.

11.2.13 Waste Management

Objectives

- To ensure correct separation and disposal of different waste streams to prevent possible contamination of ambient soil, water and air quality.

6.3.9.2 Management Activities

- Construction personnel shall be informed of the importance of disposing of waste in a suitable manner and the procedures for disposal of collected waste.
- Collected waste shall be separated into the different categories of hazardous, general waste and construction rubble.
- A suitable number of dustbins shall be placed on site and especially at Stop-and-Go's to collect refuse.
- Waste containers shall be provided with lids or netting to prevent waste from being disturbed by scavengers or being blown away by wind.
- Waste shall be removed from site on a regular basis.
- Discharges of hazardous chemicals (paint, turpentine, oil, etc) as declared under the Hazardous Substances Act as amended, on the site or outside of the site is prohibited.
- The use of degreasing agents on site is strictly prohibited.

- Potentially hazardous materials shall be handled and stored on site in containers with tight lids that shall be sealed and disposed of at an appropriately permitted hazardous waste disposal site.
- The Contractor shall maintain a hazardous materials register which must document the use, storage, final destination and method of disposal of all hazardous substances.
- The contractor shall submit copies of material Safety Data Sheets (in accordance with the requirements of the OHS Act - i.e. sixteen point MSDS format) to the OHS agent for review and approval for all substances and chemical to be used on site. Only after approval shall the Contractor be permitted to bring such substances and chemicals onto the site.
- Liquid waste from chemical toilets shall be emptied on a regular basis, to a designated sewage treatment works in close proximity.
- Adequate ablution facilities shall be provided at the construction campsite.
- Ablution facilities shall be positioned at least 100m from any watercourse and/or drainage line.
- No waste shall be buried on site.
- Illegal dumping (either at the construction site or in surrounding areas) shall not be tolerated.
- Burning of waste on site is strictly forbidden.
- All materials defined as hazardous shall be stored within a bunded and secure area (>50L).
- The floor and bund walls should be impervious to the material stored and should be capable of containing 110% of the total volume of hazardous substance stored.
- Fuel or lubricant tanks shall be secured and provided with collision protection.
- Valves shall be locked when not in use, and shall be protected from vandalism and unauthorised use.
- Valves shall be within the confines of the bunded/impervious areas.
- Small quantities of hazardous substances (50l or less) shall be stored in appropriate containers within a secure storage area.
- Base of the storage area shall be impervious and so designed as to ensure that the hazardous substances do not infiltrate into the soil.
- Used fuels, oils, hydraulic fluids, paints and solvents and grease shall be stored in drums or other suitable containers. These shall be labelled, sealed and removed from the site to an appropriate disposal site.
- Provide collection systems (i.e. trays or impervious linings) under machinery or equipment that may dispense hazardous substances (i.e. generators and pumps).

11.2.14 Pollution Control

Objective

- To minimise pollution of ambient soil, water and air quality in the event of a spillage or contamination.

Management Activities

- Under no circumstances shall hazardous substances be disposed of on site or into the surrounding environment.
- Any spillage of sewage either caused by the Contractor during the upgrading activities shall be cleaned up at the expense of the Contractor.
- Accidental pollution incidents shall be reported to the Engineer/ECO immediately and shall be cleaned up by the Contractor or a nominated clean-up organisation at the expense of the contractor.

- Soil polluted by incidents described above shall be disposed of at a licensed landfill site waste site and certificates of safe disposal at this site presented to the ECO for safe keeping.
- An area for emergency servicing of construction vehicles shall be designated at all construction camps. The area shall be lined with a water proof liner and be contained to prevent any run-off. Any spillage, contamination and waste (hazardous/normal) shall be disposed as described in the bullet point above.
- Above ground diesel storage vessels shall be contained in a water and oil proof bund, and in such a manner that any spillages or leaks are contained with the bund. The bund shall be constructed using an oil proof geo-textile liner that is cover with clayey sands to a minimum depth of 150mm. The side walls of the bund shall be at least 200mm high, and the total capacity of the bund shall be at least:
 - Single tank - 110% the capacity of the tanks and any pipe work
 - Multiple tanks - 100% the capacity of the largest tank plus 10% of the combined capacity of the other tanks.
- The following substances shall not be allowed on site:
 - Asbestos and asbestos containing substances
 - Creosote and creosote containing substances
 - Feon 22 (Ozone depleting substance)
 - Methylenechloride(degreasing agent)
 - Perchloroethene(degreasing agent)
 - Perchloroethylene(degreasing agent)
 - Polychlorinated biphenyls (dielectric fluids)
 - Terachloroethene(degreasing agent)
 - Tetrachloroethylene(degreasing agent)
 - Trichloroethene(degreasing agent)
 - Trichloroethylene (degreasing agent)

11.2.15 Wastewater

Objectives

- To control the pollution aspects of any wastewater.

Management Activities

- Natural storm water runoff that is not polluted by site operations shall be diverted around spoil dumps and topsoil stockpiles.
- Measures shall be taken to minimise the flow of storm water to the trench activities.
- Where uncontaminated storm water has accumulated in the trench excavations and needs to be pumped out, it shall be disposed of onto flat grassy areas.
- Potentially polluted or contaminated storm water shall be directed towards a sump or coffer dam to be further managed as appropriate.

11.2.16 Batching Plants

Objectives

- To ensure the correct procedures are followed wherever cement, concrete or bitumen is used to avoid contamination of the environment.

Management Activities

- Concrete/bitumen shall be mixed only in the area demarcated for this purpose.
- Concrete batching plants shall be located in an area of low environmental sensitivity & at least 100m away from any drainage lines/water courses.

- Topsoil shall be removed from the batching plant site and stockpiled in the designated areas.
- The batching plant site shall be bunded with earth berms or sandbags such that runoff cannot escape from the plant site.
- Cement/bitumen shall be stored and mixed on an impermeable substratum.
- The concrete batching works shall be kept neat and clean at all times.
- Contaminated storm water and wastewater runoff from the batching area and aggregate stockpiles shall not be permitted to enter streams but shall be directed to a sump.
- Unused cement bags are to be stored in such a way that it will not be effected by rain or runoff events
- Used bags shall be stored and disposed of off-site and shall not pollute the surrounding environment.
- All reasonable measures must be taken to ensure that transportation of concrete/cement does not result in spillage.
- Runoff resulting from cleaning of equipment and flushing of mixers shall be diverted to a sump and not be allowed to pollute the environment.
- Suitable screening and containment shall be put in place to prevent wind blown contamination associated with any bulk cement silos, loading and batching.
- Waste concrete and cement sludge shall be removed and disposed of at an approved landfill site.
- All visible remains of excess concrete shall be physically removed on completion of the plaster or concrete and disposed at an approved disposal site.
- All concrete/bitumen spilled outside this area shall be removed by the Contractor.

11.2.17 Air Quality

Objectives

- To ensure that construction activities do not impact negatively on the ambient air quality.

Management Activities

- Dust can be generated from a variety of sources and measures shall be implemented to prevent dust from becoming problematic. The measures will include:
 - Avoid dust generating activities during periods of medium to high winds.
 - Cover and/or maintain appropriate freeboard on trucks hauling any loose material that could produce dust when travelling.
 - Limit the areas that need to be cleared of vegetation.
 - Revegetate disturbed areas as soon as possible after clearing.
 - Dampen exposed soil to suppress dust i.e. with water bowser.
- The burning of waste on site is strictly forbidden.

11.2.18 Noise Quality

Objectives

- The objective is to minimise the amount of noise pollution.

Management Activities

- All employees shall be given the necessary ear protection gear as required by the OHS Act and Regulations.
- All noise sources shall be controlled at the source.
- Appropriate directional and intensity settings should be maintained in good working order.

11.2.19 Visual Quality

Objectives

- To minimise the visual impacts of the construction site on the surrounding communities.

Management Activities

- Ensure that any signage (i.e. at entrance gate of construction camp site) is visible but not visually intrusive.
- Ensure good housekeeping at the construction campsite and control litter and general site cleanliness.
- Ensure that adequate ablution facilities are in place, that the workforce utilises these facilities and that they are placed where they are not visible to the public.
- Security lighting should be placed so that they only illuminate the area to be protected.
- Stop-and-Go's should be provided with adequate lighting and signage to ensure road users' safety.

11.2.20 Fire Risk and Burning

Objectives

- To ensure that there is minimal risk of fire on the construction site.

Management Activities

- The Contractor shall ensure that the risk of fire at any location on site is kept to a minimum.
- The Contractor shall develop a Fire Management Procedure.
- The Contractor shall ensure that all construction staff are aware of these procedures.
- The Contractor shall supply fire fighting equipment in proportion to the fire risk presented by the type of construction and other on site activities and materials used on site.
- This equipment shall be kept in good working order.
- Open fires shall only be allowed at designated facilities.
- Any welding or other sources of heating shall be done in a controlled environment and under appropriate supervision, in such a manner as to minimise the risk of veld fires and/or injury to staff.
- OHS Act requirement relating to fire precautions and fire control shall be implemented.
- All waste bins shall be kept away from fuel tank installations.
- Smoking may only be practiced in designated smoking areas.
- Smoking near refuelling depots or near any flammable substances shall be prohibited.
- Cigarette butt bins (wet sand filled), where provided, shall be emptied on a daily basis.

11.2.21 Heritage, Archaeology & Palaeontology

Objective

- To ensure that any archaeological or historical artefacts that may be found are protected as per SAHRA's requirements.

Management Activity

- The identified archaeological site NGQUNGE 1 shall be formally conserved by:
 - Temporary fencing of the site during the course of construction; and
 - Permanent signage at the site locale describing the formal protection status of the site in both English and Xhosa
- All finds of human remains during construction shall be reported to the nearest police station.
- Human remains from the graves of victims of conflict, or any burial ground or part thereof which contains such graves and any other graves that are deemed to be of

cultural significance may not be destroyed, damaged, altered, exhumed or removed from their original positions without a permit from the South African Heritage and Resource Agency (SAHRA)

- Work in areas where artefacts are found shall cease immediately and SAHRA notified.
- Under no circumstances shall the Contractor, employees, subcontractors or subcontractors' employees remove, destroy or interfere with archaeological artefacts.
- Any person who causes intentional damage to archaeological or historical sites and/or artefacts could be penalised or legally prosecuted in terms of the national Heritage Resources Act 25 of 1999.
- A fence of at least 3m outside the extremities of the site shall be erected to protect archaeological sites.
- All known and identified archaeological sites shall be left untouched.
- Any discovery of Palaeontological resources should be reported to the ECO and handled as described in the Palaeontological Desk Top Study compiled by Dr. Almond (April 2010).

11.2.22 Public Interaction

Objectives

- To ensure that the general public is not affected in a negative manner by the contractor or his employees.

Management Activities

- The Contractors activities and movement of staff shall be restricted to the construction site and route.
- The relevant authorities shall be notified of any interruptions of services.
- Care shall be taken to avoid damaging major and minor pipelines as well as existing culverts.
- Disruption of access for local residents during construction shall be kept to a minimum.
- All reasonable precautions shall be taken during construction to avoid severely interrupting the traffic flow on existing roads (particularly during holiday periods).

11.2.23 Site Closure

Objectives

- To ensure that upon site closure no further degradation of the environment or surrounding environment shall occur.

Management Activities

- All waste shall be removed from site.
- All ablution facilities shall be removed from site.
- Areas that are impacted by construction activities (e.g. laydown areas and construction camps) shall be rehabilitated.

11.3 DEDEA - Environmental Authorization

- The DEDEA Environmental Authorisation shall be attached as an Appendix to the Contractors' documentation.
- The DEDEA Environmental Authorisation shall be presented to all sub-contractors.
- All conditions contained in the DEDEA Environmental Authorisation shall be legally binding.

12 Plant Rescue and Translocation Programme

If any 'Species of Special Concern' (SSC) are located within the footprint of the road, construction camps and laydown areas, a Botanist shall be commissioned to mark the location of 'Species of Special Concern' (SSC) that shall need to be rescued and translocated. At least 50% of protected species etc should be rescued. If the number of SSC is low, then all should be rescued. The plants shall be marked in an appropriate manner. Other species that can be easily transplanted, such as bulbous plants and succulents, should also be rescued. A local Horticulturist/Botanist should then be employed to implement the Rescue and Translocation Programme, which shall entail:

1. Removing the SSC, trees, shrubs, bulbous plants etc.
2. If transplant is not possible directly after removal then a nursery shall be provided to store the plants.
3. The plants can either be transplanted to similar habitats (i.e. within the wetland) where the potential for survival is high.
4. Taking the necessary measures to enhance the survival of the plants that is deemed necessary, namely watering, pruning the canopy, implementing the programme at the appropriate time of the day.

13 Appendix A: EMP Assessment Checklist

Issue	Action	Frequency	Compliance (yes/no)	Person Responsible	Action Required	Date of Implementation	Implementations Successful
Pre-Construction and Site Establishment							
Pre-construction	Has an Environmental Liaison Officer (ELO) been nominated?	Once-off					
	Is the ELO aware of his responsibilities?	Once-off					
	Has the EMP been included in contracts/terms of reference for sub contractors and suppliers in all tender documentation related to the project?	Once-off					
	Have the construction staff been given adequate environmental training?	Once-off					
	Are procedures in place for dealing with acts of non-compliance with the EMP?	Once-off					
	Has the project engineer included methods to reduce and ameliorate erosion in the project specification?	Once-off					
	Has a Fire Management Procedure been drawn up?	Once-off					
Site establishment	Has a suitable location for construction activities and all workings been selected?	Once-off					
	Have Project Layout Plans for construction camps been developed?	Once-off					
Construction							
General	Has the Environmental Incidents register been kept up to dated?	Continuous					
	Is there commitment to the implementation of the EMP?	Continuous					
	Are construction activities conducted as per the approval Project Layout Plans?	Continuous					
Natural Resources	Has site clearance been kept to a minimum?	Regular					
	Have wild animals, anthills or termite mounds and bird nesting sites remained undisturbed?	Continuous					
Stop-and-Go's	Has a suitable number of rubbish bins and litter fencing been provided?	Regular					
	Have bins been provided with lids/netting?	Regular					
	Has signage discouraging littering been provided?	Regular					
	Are rubbish bins & litter fences being maintained?	Regular					
Vegetation Clearance	Has the vegetation clearance been according to what was laid out in the clearing plan?	Regular					
	Has the minimum amount of vegetation clearing possible taken place?	Continuous					
	Has vegetation outside the demarcated boundary lines	Continuous					

Issue	Action	Frequency	Compliance (yes/no)	Person Responsible	Action Required	Date of Implementation	Implementations Successful
	been left undisturbed?						
	Is tagged alien vegetation being destroyed and appropriate measures taken to prevent the further spread of aliens?	Continuous					
Topsoil	Is topsoil being stripped from the specified areas only?	Continuous					
	Is the minimum amount of topsoil being stripped from areas affected by construction?	Continuous					
	Is topsoil being properly stripped?	Continuous					
	Is topsoil being properly stored?	Continuous					
Buwa & Mbulo Rivers	Is site staff prevented from using the rivers for bathing, washing of clothing/equipment?	Continuous					
	Are the rivers off-limits in terms of construction activities or disposal of waste?	Continuous					
	Have adequate sedimentation control measures been instituted?	Regular					
	Has adequate bank protection been provided?	Once-off					
	Has sediment traps been provided?	Once-off					
	Are the sediment traps being maintained?	Regular					
Water Abstraction	Is water being abstracted from approved points/sources?	Once-off					
	Is daily monitoring being conducted?	Continuous					
	Is water use below level of limits set by DWA?	Continuous					
Erosion	Have the areas of disturbance been minimized?	Continuous					
	Have disturbed areas been revegetated timeously?	Regular					
	Has existing erosion been stabilized?	Regular					
	Are cut and fill slopes appropriately stabilized?	Regular					
Fire Risk & Burning	Has fire fighting equipment been supplied?	Regular					
	Is the fire fighting equipment in good working order?	Regular					
	Are construction staff aware of the Fire Management Procedure?	Regular					
	Are all fire prevention measures being adhered to?	Continuous					
Site & Route Housekeeping	Are all work areas clean and tidy?	Continuous					
Waste management	Have construction personnel been instructed on the importance and correct methods of waste	Once-off					

Issue	Action	Frequency	Compliance (yes/no)	Person Responsible	Action Required	Date of Implementation	Implementations Successful
	disposal?						
	Has collected waste been separated into different categories?	Continuous					
	Are there adequate facilities for the disposal of different wastes?	Regular					
	Has waste been disposed of correctly?	Continuous					
	Has the hazardous material register been maintained?	Regular					
	Are all MSDS available on site	Regular					
	Have hazardous material storage areas been adequately banded?	Once-off					
	Are fuel and lubricant tanks secured and provided with collision protection?	Continuous					
	Are there adequate storage facilities for hazardous substances?	Regular					
	Are there adequate and correctly placed ablution facilities?	Regular					
	Has illegal dumping, burying or burning of waste on site been prevented?	Continuous					
Pollution control	In the event of accidental pollution, have the correct steps been taken to remediate this?	Continuous					
	Have polluted waters or hazardous substances been prevented from entering the environment?	Continuous					
Wastewater	Has unpolluted natural storm water runoff been diverted around spoil dumps and topsoil stockpiles?	Continuous					
	Has the flow of storm water into trenches been cost-effectively minimized?	Continuous					
	Has disposal of uncontaminated storm water been done to avoid erosion along its course?	Continuous					
Batching Plants	Is concrete being mixed within the demarcated areas only?	Continuous					
	Is cement properly stored?	Continuous					
	Have concrete spills been removed and properly disposed of?	Continuous					
Air Quality	Have dust generating activities been minimized during periods of medium to high winds?	Continuous					
	Has exposed soil been dampened or covered?						
	Has burning of waste prohibited?	Continuous					
	Have electrical/gas cooking facilities been provided?	Once-off					
Noise Quality	Are noise sources being controlled?	Continuous					
	Do employees have the necessary ear protection?	Regular					
	Are noise levels being kept	Continuous					

Issue	Action	Frequency	Compliance (yes/no)	Person Responsible	Action Required	Date of Implementation	Implementations Successful
	low as possible?						
Visual Quality	Have the vegetated slopes been protected and maintained?	Continuous					
	Is signage visually unobtrusive?	Continuous					
	Is safety and security lighting used for the purposes they were intended?	Continuous					
Health & Safety	Is a first aid box available on site?	Regular					
	Are measures in place to prevent interruption of collision with powerlines?	Regular					
	Are measures in place to protect workers and equipment from lightning strikes?	Regular					
Public Participation and interaction	Are contractor's activities and movement of staff restricted to the construction site and route?	Continuous					
	Are the relevant authorities being notified of any interruptions of services?	Continuous					
	Is care being taken to avoid damaging pipelines?	Continuous					
Heritage and Archaeology	In the event of a discovery of human remains or archaeological artefacts refer to EMP for procedure						
Post Construction							
Revegetation	Are disturbed areas being reinstated to a state that approximates or betters the state they were in prior to construction/	Regular					
	Are drainage deficiencies being restored and reshaped?	Regular					
	Are cut and fill areas being restored and reshaped?	Regular					
	Are areas compacted by vehicles being scarified?	Regular					
	Is the rehabilitation contractor weeding the rehabilitated area?	Regular					
General & Road Maintenance	Have a suitable number of rubbish bins been provided?	Regular					
	Is there any illegal dumping on site?	Regular					
	Has adequate ablution facilities been provided?	Regular					
	Is liquid waste from chemical toilets emptied on a regular basis to a licensed sewage treatment works	Regular					
Stop-and-Go's	Has a suitable number of rubbish bins and litter fencing been provided?	Regular					
	Have bins been provided with lids/netting?	Regular					
	Has signage discouraging littering been provided?	Regular					
	Are rubbish bins & litter fences being maintained?	Regular					
Erosion control	Have areas of disturbance	Continuous					

Issue	Action	Frequency	Compliance (yes/no)	Person Responsible	Action Required	Date of Implementation	Implementations Successful
	and vegetation clearance been kept to the minimum?						
	Have areas been revegetated as soon as possible?	Continuous					
	Have cut and fill slopes been stabilized appropriately?	Continuous					
	Have concrete spills been removed and properly disposed of?	Continuous					
Site Closure	Has all waste been removed from the site?	Once-off					
	Have all ablution facilities been removed from the site?	Once-off					
	Have all temporary fences and signs been removed?	Once-off					

16 Appendix D: Environmental Code of Conduct

SANRAL is committed to ensuring that the improvement of National Route 2: Section 18 is undertaken in a manner that minimises negative impact to the environment.

SANRAL requires that all construction personnel involved in the construction process accept their responsibilities towards the EMP and the environment. This includes all permanent, contracted, temporary and casual workers as well as any other person involved with the project or visiting the site. Ignorance, negligence, recklessness or a general lack of commitment shall not be tolerated.

Contractors shall ensure that all of its sub-contractors, employees, suppliers, agents, etc., are fully aware of the environmental issues detailed in the Construction Phase EMP. Contractors must investigate and comply with all existing regulations and laws/ bylaws unless the Relevant Authority grants specific written authority waiving compliance with any legislation.

The following list represents the basic Do's and Do Not's towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks. These are not exhaustive and serve as a quick reference aid.

DO:

- CLEAR YOUR WORK AREAS OF LITTER AND BUILDING RUBBISH AT THE END OF EACH DAY - use the waste bins provided and ensure that litter will not blow away.
- MAINTAIN WASTE REMOVAL SYSTEM.
- SMOKE CIGARETTES IN DESIGNATED AREAS ONLY
- DISPOSE OF CIGARETTES AND MATCHES CAREFULLY.
- USE THE TOILET FACILITIES PROVIDED AND KEEP IT CLEAN.
- REPORT DIRTY OR FULL TOILET FACILITIES.
- PREVENT CONTAMINATION OR POLLUTION OF STREAMS AND WATER CHANNELS.
- MAINTAIN CONCRETE BATCHING AREAS AND CEMENT EFFLUENT FROM WASHING AREAS.
- REPORT HERITAGE REMAINS IMMEDIATELY.
- ENSURE THAT VEHICLES AND MACHINERY DO NOT LEAK FUEL OR OILS.
- REPORT ALL FUEL OR OIL SPILLS IMMEDIATELY & STOP THE SPILL CONTINUING.
- CONFINE WORK AND STORAGE OF EQUIPMENT TO WITHIN THE IMMEDIATE WORK AREA.
- PREVENT EXCESSIVE DUST AND NOISE.
- USE SAFETY EQUIPMENT AND COMPLY WITH ALL THE REQUIREMENTS OF THE OHS ACT.
- HOT WORK MAY ONLY BE UNDERTAKEN IN DESIGNATED HOT WORK AREAS
- ENSURE A WORKING FIRE EXTINGUISHER IS IMMEDIATELY AT HAND IF ANY "HOT WORK" IS UNDERTAKEN e.g. welding, grinding, gas cutting etc.
- DRIVE ON DESIGNATED ROUTES ONLY.
- RESPECT EXISTING SERVICES AT ALL TIMES.

DO NOT:

- REMOVE OR DAMAGE VEGETATION WITHOUT DIRECT INSTRUCTION.
- INJURE, TRAP, FEED OR HARM ANY ANIMALS - this includes birds, frogs, snakes, lizards etc.
- REMOVE ANY HERITAGE REMAINS.
- MAKE UNAUTHORISED FIRES.
- ALLOW CEMENT OR CEMENT BAGS TO BLOW AROUND.
- LITTER OR LEAVE FOOD LYING AROUND.
- ALLOW WASTE, LITTER, OILS OR FOREIGN MATERIALS INTO WATER WAYS.
- ENTER ANY FENCED OFF OR MARKED AREA.
- SPEED OR DRIVE RECKLESSLY.

If you do not understand the rules you shall seek assistance to ensure compliance. The following people can assist you in ensuring compliance with the EMP.

Contractor	Mr. XXX - (Name & Tel)
Contractors - Environmental Liaison Office:	Mr. XXX - (Name & Tel)
Project Engineer	Mr. Gerhard Maritz (021 526 9405)
Project Manager:	Mr. David Nel (021 526 9405)
Environmental Control Officer:	Mr. Conroy van der Riet (043 726 4242)

THIS PAGE INTENTIONALLY LEFT BLANK

END