DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR THE PROPOSED CONSTRUCTION OF THE UFAFA WATER SUPPLY SCHEME, UFAFA, HARRY GWALA DISTRICT MUNICIPALITY, KWAZULU-NATAL

Prepared by: Terratest (Pty) Ltd PO Box 794 Hilton 3201	
Prepared for: Harry Gwala District Municipality Private Bag X501 Ixopo **3276**	

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR THE PROPOSED CONSTRUCTION OF THE UFAFA WATER SUPPLY SCHEME, UFAFA, HARRY GWALA DISTRICT MUNICIPALITY, KWAZULU-NATAL

1. INTRODUCTION

1.1 PROJECT BACKGROUND AND INFORMATION

1.1.1 Water Supply

The Ufafa Water Supply Project forms part of the Sisonke District Municipality's Regional and Sub-regional plan for supplying potable water to areas which have not had access to safe drinking water and conforms to the standards as set down by the Reconstruction and Development Programme.

The proposed project will entail the following:

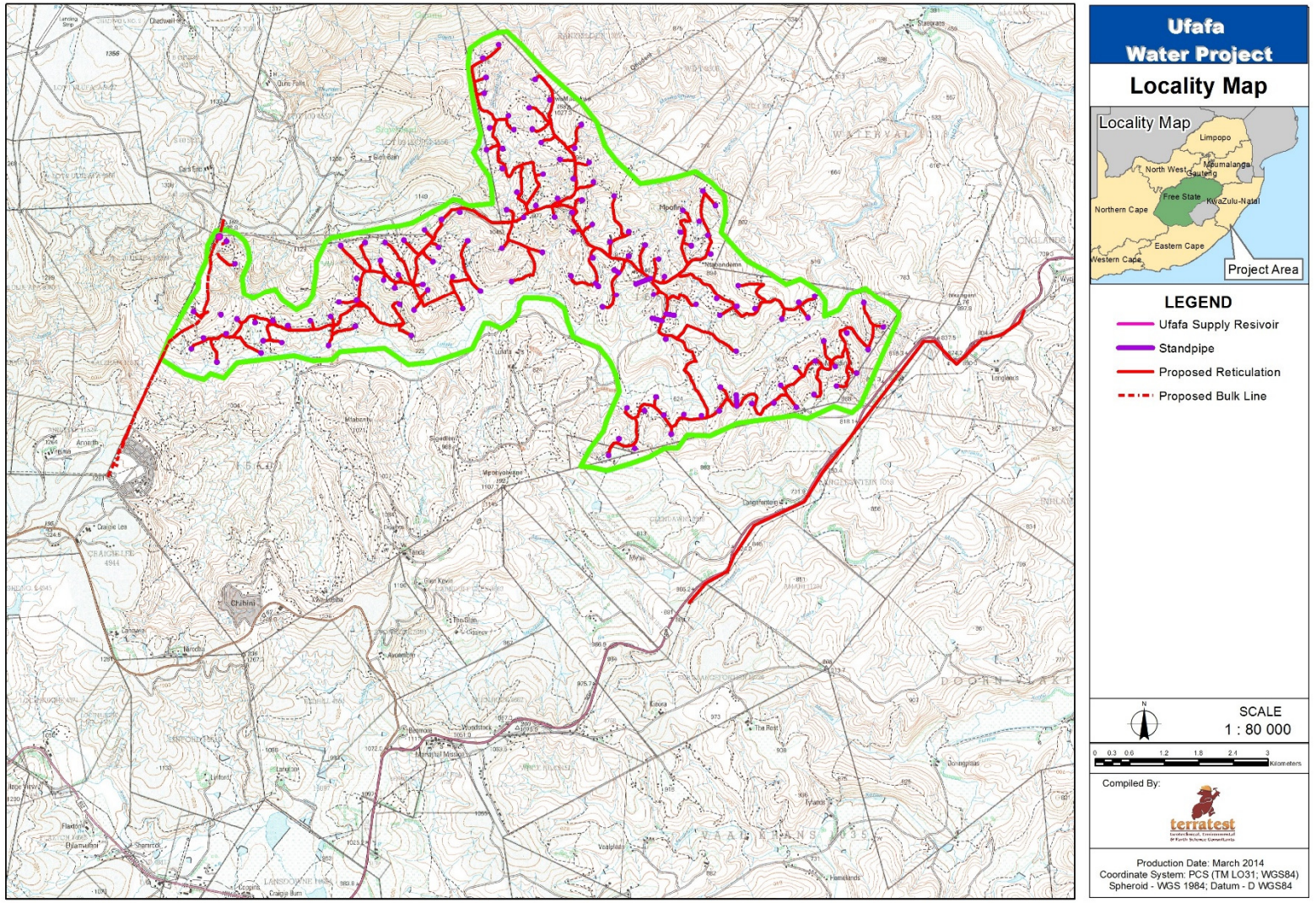
- The construction of the water reticulation network to approximately 1 060 households as identified from recent orthophotos;
- The construction of a new 4 000 m bulk main to the area with associated reticulation estimated to be approximately 69 900 m;
- The construction of one 1 ml reservoir to serve the project area;
- The construction of supply points to supply the households within a 200 m radius;
- The construction of break pressure tanks;
- The construction of a pipe bridge over the Lufafa River;
- The network will include for air valves, isolating valves and scour valves. Isolating Valves will be located to minimise the effect of closure on the supply and to suit Scour activities;
- Bulk meters will be provided at the boundary of each distinct supply zone;
- The networks are designed to cater for an ultimate demand of 60 l/c/day although only communal standpipes will be provided for in terms of this Technical Report;
- It is envisaged that yard connections will be installed and paid for by the payment of a connection fee. Municipal Infrastructure Grant (MIG) funds will be utilised to provide community dispensing units only where required.

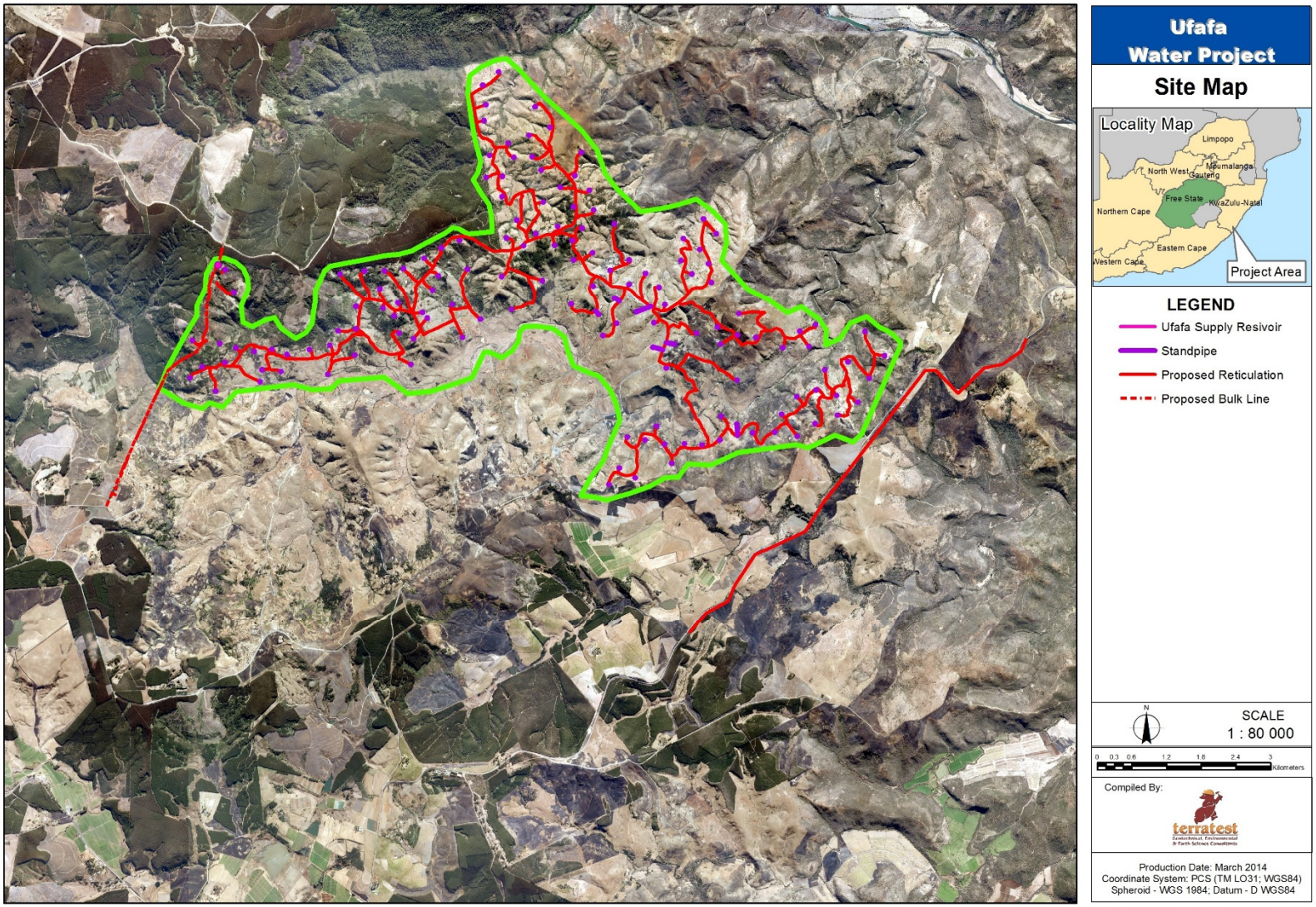
The project is located at the following co-ordinates:

Starting point	30º	03‘	56.82“	30º	08‘	32.94“
Middle point	30º	02‘	4.34“	30º	06‘	31.17“
End point	30º	03‘	15.95“	30º	02‘	55.85“

The preferred option which is being proposed is to following the alignment of the existing access roads. This is preferred because:

- The alignment will follow an existing line of disturbance and does not imply the segmentation of additional biomes;
- The availability of road access allows for easier access during construction;
- It does not require the development of any construction access roads thus limiting the construction footprint and the area to be rehabilitated;
- Easier access allows for quicker implementation;
- It does not require the maintenance of a service road in order to operate the system; and
- Lesser social impacts as the alignment does not require the traversing of cultivated areas or require resettlements.


Ufafa
Water Project
Locality Map
Locality Map
Limpopo
North West
Mpumalanga
Gauteng
Free State
KwaZulu-Natal
Northern Cape
Eastern Cape
Western Cape
Project Area
LEGEND
Ufafa Supply Resivoir
Standpipe
Proposed Reticulation
Proposed Bulk Line
N
SCALE
1 : 80 000
0 0.3 0.6 1.2 1.8 2.4 3
Kilometers
Compiled By:
terratest
Production Date: March 2014
Coordinate System: PCS (TM LO31; WGS84)
Spheroid - WGS 1984; Datum - D WGS84


Ufafa
Water Project
Site Map
Locality Map
Limpopo
North West
Mpumalanga
Gauteng
Free State
KwaZulu-Natal
Northern Cape
Eastern Cape
Western Cape
Project Area
LEGEND
Ufafa Supply Resivoir
Standpipe
Proposed Reticulation
Proposed Bulk Line
N
SCALE
1 : 80 000
0 0.3 0.6 1.2 1.8 2.4 3
Kilometers
Compiled By:
terratest
Production Date: March 2014
Coordinate System: PCS (TM LO31; WGS84)
Spheroid - WGS 1984; Datum - D WGS84

1.1. 2 Project Team

The proponent, Harry Gwala District Municipality, appointed Nathoo Mbenyane Engineers (NME) to undertake the design of the Water Supply Scheme. NME in turn appointed Terratest (Pty) Ltd to conduct the Basic Assessment process.

1.2 AIMS OF THIS DOCUMENT

The purpose of this Environmental Management Programme (EMPr) is to ensure that the impacts of the project on the environment are kept to a minimum. This includes ensuring the continued monitoring of the construction phase and the involvement of interested and affected parties (IAPs – as necessary) in a meaningful way.

1.3 STATUS OF THIS DOCUMENT

The provisions of this EMPr are binding on the Contractor during the construction period and the Defects Liability Period of the contract. This specification must be read in conjunction with all the documents that comprise the contract documents for this contract and any Environmental Authorisation which has been issued by the Competent Authorities.

1.4 DEFINITIONS USED IN THIS DOCUMENT

For the purpose of this EMPr the following definitions will apply:

Alien vegetation means all undesirable vegetation, defined as but not limited to, all declared category 1 and category 2 plants in terms of the Conservation of Agricultural Resources Act (43 of 1983) (CARA) amended regulations 15 and 16 as promulgated in March 2001.

Construction activity refers to any action taken by the Contractor, his subcontractors, suppliers or personnel in undertaking the construction work.

Construction area(s) refers to all areas used by the Contractor in order to carry out the required construction activities. This includes, all offices, accommodation facilities, testing facilities/laboratories, batching areas, storage & stockpiling areas, workshops, spoiling areas, borrow pits, access roads, traffic accommodation (e.g. bypasses), etc.

Environment means the surroundings within which humans exist and that are made up of - land, water and atmosphere; micro-organisms, plant and animal life; any part or combination of the above and the interrelationships among and between them; the

physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Environmental Impact refers to any change to the environment, whether desirable or undesirable, that would result directly or indirectly from any construction activity.

Hazardous material/substances refer to any substance that contains an element of risk and could have a deleterious effect on the environment.

Vegetation rehabilitation refers to the re-establishment of locally indigenous vegetation with a similar species composition to that which naturally occurs in the area.

1.5 LEGISLATION PERTAINING TO THIS DOCUMENT

1.5.1 The South African Constitution (No 108 of 1996)

Chapter 2, the Bill of Rights, includes Section24 which makes provisions for Environmental rights; Section 25 relates to Rights in property; Section 32 to Administrative justice; and Section 33 to Access to Information.

1.5.2 National Environmental Management Act (NEMA) (Act 107 of 1998)

NEMA a 'principles-based Act' and is an overarching statute regulating various aspects of natural resource use, integrated environmental management and pollution control. The Act provides for the right to an environment that is not harmful to the health and well-being of the South African people. Sustainable development, environmental protection, equitable distribution of natural resources; and the formulation of environmental management frameworks are also fundamental. The definition of the environment includes the land and water of the earth, micro-organisms, plant and animal life or a combination of those things, and the inter relationships among them.

The Act aims to provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance, and procedures for co-ordinating environmental functions exercised by organs of state. Section 24 Provides for the prohibition, restriction and control of activities which are likely to have a detrimental effect on the environment.

NEMA contains a set of principles that govern environmental management, and against which all environmental management programmes and actions are measured. Sustainable development requires the consideration of all relevant factors including the following:

- Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
- That the disturbance of ecosystems and loss of biological diversity are avoided, or where they cannot be altogether avoided, are minimized and remedied.
- That pollution and degradation of the environment are avoided, or, where unavoidable, are minimised and remedied.
- That waste is avoided, or where unavoidable is minimised and reused or recycled where possible and/or disposed of in a responsible manner.
- That a risk-adverse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions or actions.
- That negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimized and remedied.
- The right of workers to refuse work that is harmful to human health or the environment and to be informed of dangers must be respected and protected.
- The role of women and youth in environmental management and development must be recognised and their full participation therein must be promoted.
- Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.
- The participation of interested and affected parties in environmental governance must be promoted, and people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation.
- The participation by vulnerable and disadvantaged persons must be ensured.
- Decisions must take into account the interests, needs and values of all interested and affected parties, and this includes recognising all forms of knowledge, including traditional and ordinary knowledge.
- That the cost of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimizing further pollution,

environmental damage or adverse health effects must be paid for by those responsible for harming the environment.

- Community well-being and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means; and
- Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.

1.5.3 The Conservation of Agricultural Resources Act (No 43 of 1983)

The main focus of this act is upon agricultural resources but it has an indirect implication for rivers and provides for the protection of agricultural land while regulations provide for the implementation of control measures for alien and invasive plant species.

1.5.4 The National Environmental Management: Air Quality Act (No 39 of 2004)

This Act provides for the control of dust, noise and offensive odours.

1.5.5 The Occupational Health and Safety Act (OHSA - No 85 of 1993)

The OSHA makes provisions in Section 8 for the general duties of employers to their employees. Section 9 of the Regulations makes provisions for general duties of employers and self-employed persons to persons other than their employees.

1.5.6 The Protected Areas Act (No 57 of 2003)

This Act aims to provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity, natural landscapes and seascapes.

1.5.7 The National Environmental Management: Biodiversity Act, 2004 (NEMBA - Act 10 of 2004)

This Act makes provisions for achieving the objectives of the United Nation's Convention on Biological Diversity, to which South Africa is a signatory.

The Bill promotes management, conservation and sustainable use of indigenous biological resources, and provides for:

- The management and conservation of biological diversity within the Republic.

- The use of indigenous biological resources in a sustainable manner; and
- The fair and equitable sharing of benefits arising from the commercialization through bio-prospecting of traditional uses and knowledge of generic resources.

The Bill gives effect to international agreements relating to biodiversity which are binding on the Republic and provides for co-operative governance in biodiversity management and conservation, and provides for a National Biodiversity Institute to assist in achieving the above objectives.

The Act gives wide powers to a National Biodiversity Institute to *inter alia* protect animals and micro-organisms in appropriate enclosures, the collection of information, undertaking and promotion of research on indigenous biodiversity and the sustainable use of indigenous biological resources, the prevention, control or eradication of listed invasive species, biodiversity planning and other functions.

1.5.8 The National Environmental Management: Waste Act (NEMWA – Act 59 of 2008)

The Waste Act reforms the law regulating waste management in order to protect health and the environment providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.

1.5.9 The Minerals and Petroleum Resources Development Act (Act 28 of 2002)

This Act makes provision for the equitable access to and sustainable development of the Nation's mineral and petroleum resources; and to provide for matters connected therewith.

The above legislation is empowering legislation for the following spheres of government:

- Department of Environmental Affairs (DEA)

- Department of Agriculture and Environmental Affairs (EDTEA)
- Department of Minerals and Resources (DMR)
- Department of Water Affairs (DWA)
- Department of Agriculture, Forestry and Fisheries (DAFF)
- Department of Health (DoH)
- Department of Transport (DoT)
- Department of Labour (DL)

2. DESIGN CONSIDERATIONS

This section highlights several environmental constraints and/or recommendations that need to be considered in the detailed design of the works.

2.1 GENERAL

Due to the varied and steep topography of the environment, safety needs to be a priority with regards to the design and construction of the watercourses crossings.

In addition, should it become necessary, erosion protection measures will need to be implemented on the site to minimise sedimentation of the watercourses.

2.2 VISUAL ASPECTS

Visual or aesthetic aspects should be taken into consideration in the design and construction of structures such as stormwater culverts, side drains, retaining walls, etc. The detailed design should make use of natural finishes (materials, colour, etc.) and the excessive use of large expanses of concrete should be avoided.

2.3 DRAINAGE

In general, stormwater culverts should reflect the positions of natural drainage lines. Where drainage lines constitute streams or wetlands, culvert numbers should be increased. Culverts should be placed, sized and designed so that they do not drain upstream of wetland areas, but facilitate surface and subsurface flow linkages with downstream systems.

3. GENERAL REQUIREMENTS

3.1 EMPr ADMINISTRATION

Copies of this EMPr must be kept at the site office and must be distributed to all senior contract personnel. All senior personnel must be required to familiarise themselves with the contents of this document. All senior personnel will be required to sign a register confirming their understanding of the document. This register must be continuously updated as changeover of senior personnel takes place.

3.2 ROLES AND RESPONSIBILITIES

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

3.2.1 Department of Agriculture and Environmental Affairs (EDTEA)

The EDTEA is the designated provincial authority responsible for authorising the EMPr. The EDTEA has overall responsibility for ensuring that the applicant (Harry Gwala District Municipality) complies with the conditions this EMPr. The EDTEA must be invited to join the Environmental Management Committee (EMC) (see below) and attend the monthly EMC meetings.

3.2.2. Employer: Harry Gwala District Municipality

Under South African environmental legislation, the Applicant/Employer is accountable for the potential impacts of the activities that are undertaken and is responsible for managing these impacts. Harry Gwala District Municipality, as the Applicant/Employer, therefore has overall environmental responsibility to ensure that the implementation of this EMPr complies with the relevant legislation. Harry Gwala District Municipality must join the EMC and attend the monthly EMC meetings.

3.2.3. Employer's Representative (ER)

Nathoo Mbenyane Engineers (NME), as the Employer's Representative (ER) would act as the Employer's on-site implementing agent and has the responsibility to ensure that the Employer's responsibilities are executed in compliance with the relevant legislation.

In addition to general project management, the ER has the responsibility to appoint the Environmental Control Officer (ECO) (see 3.2.4 below). Any on-site decisions regarding environmental management are ultimately the responsibility of the ER.

The on-site ER must assist the ECO where necessary and will have the following responsibilities in terms of the implementation of this EMPr:

- Ensuring that the necessary environmental authorisations and permits have been obtained;
- Reviewing and approving the Contract's Method Statements with input from the ECO (see 3.2.4 below) where necessary;
- Assisting the Contractor in finding environmentally responsible solutions to problems with input from the ECO and EMC (see 3.2.6 below) where necessary;
- Ordering the removal of person(s) and/or equipment not complying with the EMPr specifications;
- Issuing fines for transgressions of site rules and penalties for contravention of the EMPr;
- Providing input into the ECO's ongoing internal review of the EMPr, which is submitted as a report to the Employer; and
- Chairing the monthly EMC meetings which may co-inside with the onsite project review meetings.

3.2.4. Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) will be an independent environmental consultant appointed by the Engineer to act as the Employer's Representative to monitor and review the on-site environmental management and implementation of this EMPr by the Contractor. He/she will do so by conducting monthly site audits for the duration of the contract and supply monthly audit reports for submission to the EMC & EDTEA.

The ECO must register with the Harry Gwala District Municipality and provide a register of proposed site visits, these must be confirmed on email or telephonically.

The ECO's duties will include the following:

- Assisting the ER in ensuring that the necessary environmental authorisations and permits have been obtained prior to construction commencing.
- Maintaining open and direct lines of communication between the ER, Employer, Contractor and EMC with regard to environmental matters.
- Reviewing the Contractor's construction Method Statements together with the ER.

- Monthly site inspections of all construction areas with regard to compliance with the EMPr.
- Monitoring and verifying adherence to the EMPr and approved Method Statements at all times.
- Monitoring and verifying that environmental impacts are kept to a minimum.
- Taking appropriate action if the specifications are not followed, this includes reporting the transgressions to the ER.
- Monitoring the undertaking by the Contractor of environmental awareness training for all new personnel coming onto site.
- Advising on the removal of person(s) and/or equipment not complying with the specifications (via the ER).
- Recommendations regarding the issuing of fines for transgressions of site rules and penalties for contraventions of the EMPr (via the ER).
- Auditing the implementation of the EMPr and compliance with the EMPr on a monthly basis.
- Compiling a final audit report regarding the EMPr and its implementation during the construction period after completion of the contract and submitting this report to the Employer and the authorising authority.

3.2.5. Contractor's Designated Environmental Officer (DEO)

The Contractor refers to the team appointed by the Employer to undertake the detailed construction activities for the construction of the water supply scheme project. Nathoo Mbenyane Engineers (NME) have been appointed to this position.

The Contractor will be required to appoint a competent individual as the Contractor's on-site Designated Environmental Officer (DEO). The selected DEO must be at least at Foreman level appointment and must fully familiarise him-/herself with the contents of this EMPr. He/she will be required to sign the register confirming his/her familiarity with the document. The DEO should furthermore possess the necessary skills to confer environmental management to all personnel involved in the contract.

The DEO will be responsible for overseeing the Contractor's internal compliance with the EMPr requirements and ensuring that the environmental specifications are adhered to on a day to day basis.

The DEO will be responsible for keeping detailed records of all site activities that may pertain to the environment and include all these aspects in an environmental register. This register must be presented at each EMC meeting and be made available to the ECO during his/her monthly audits. In addition to the environmental register the DEO must keep a register of complaints from any community members on environmental issues. Finally, the DEO will be required to keep a record of all on-site environmentally related incidents and how these incidents were dealt with.

3.2.6. Environmental Management Committee (EMC)

The EMC must be a multidisciplinary team tasked with monitoring the progress of the EMPr and resolving any environmental problems that may arise during the course of the project. The EMC must be accountable for ensuring that environmentally sound principles guide the project during the construction phase.

The EMC must consist of all the relevant stakeholders in the construction phase, as well as representatives of interested and affected parties, for example:

- Employer (Harry Gwala District Municipality)
- Employer's representative (NME)
- Contractor's representative (the DEO from TBA)
- Any affected landowners and/or communities and,
- The local municipalities.

The EMC musts meet on a monthly basis.

3.2.7. Organizational structure

Details of the organizational structure are presented in Figure 1. The structure illustrates the reporting procedures for stakeholders in the implementation of this EMPr.

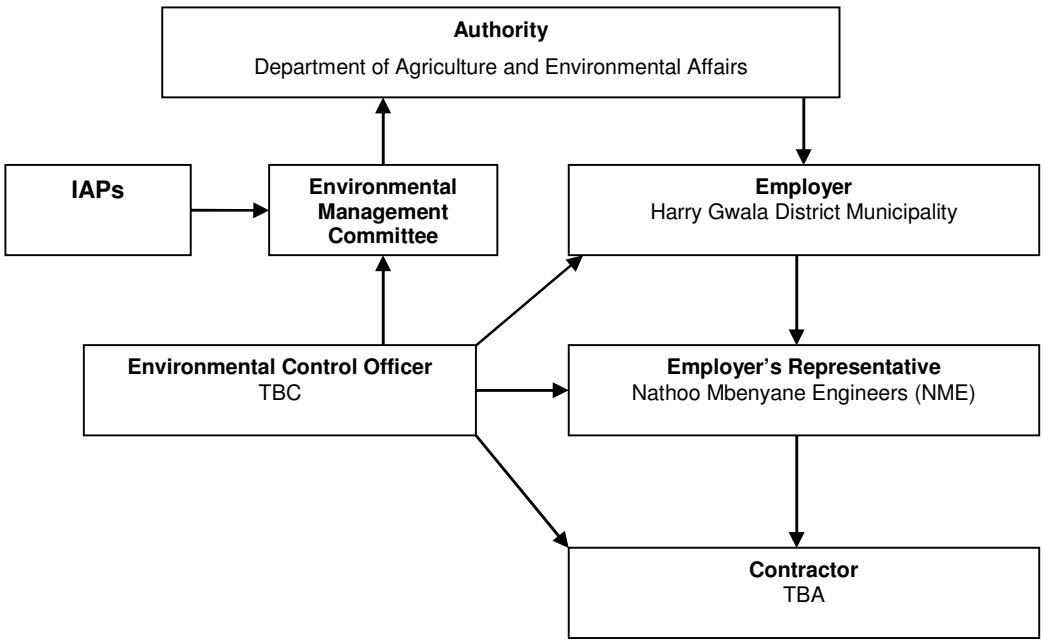


Figure 1: EMPr implementation organisational structure.

3.3 ENVIRONMENTAL AWARENESS TRAINING

The Contractor must ensure that adequate environmental awareness training of senior site personnel takes place and that all construction workers receive an induction presentation on the importance and implications of the EMPr.

Although adherence to training is the responsibility of the Contractor the environmental training must be the responsibility of the ECO.

The presentation must be conducted, as far as possible, in the employees' language of choice.

As a minimum, training must include:

- What is meant by "environment";
- Why the environment needs to be protected;
- Explanation of the importance of complying with the EMPr;
- Discussion of the potential environmental impacts of construction activities;
- The benefits of improving personal performance;
- Employees' roles and responsibilities, including emergency preparedness;
- Social responsibility, including respect to the surrounding community, their privacy and their environment;

- Explanation of the mitigation measures that must be implemented when carrying out their activities;
- Explanation of the specifics of this EMPr and its specification;
- Explanation of the management structure of individuals responsible for matters pertaining to the EMPr.

If necessary, translators and the ECO must be present to explain more difficult/technical issues and to answer questions.

The Contractor must keep records of all environmental training sessions, including names, dates and the information presented. These records will be presented at the EMC meetings and to the ECO on request during his/her monthly audits.

The Contractor must monitor the performance of the construction workers to ensure that points relayed during their training have been properly understood and are being followed. If necessary, the ECO and/or a translator should be called to the site to further explain aspects of the EMPr which are unclear.

3.4 METHOD STATEMENTS

Method Statements (MS) are written submissions by the Contractor to the ER in response to the requirements of this EMPr or to a request by the ER/ECO. The Contractor must be required to prepare Method Statements for several specific construction activities and/or environmental management aspects.

The Contractor must not commence the activity for which a Method Statement is required until ER has approved the relevant Method Statement.

Method Statements must be submitted at least 20 working days prior to the date on which approval is required, to the ER. The ER must in turn accept or reject the Method Statement within 10 working days of receipt.

Failure to submit a Method Statement may result in suspension of the activity concerned until such time as a Method Statement has been submitted and approved.

An approved Method Statement must not absolve the Contractor from any of his obligations or responsibilities in terms of the contract. However, any damage caused

to the environment through activities undertaken without an approved Method Statement must be rehabilitated at the Contractor's expense.

The Method Statements must cover relevant details with regard to:

- Construction procedures and location of the construction site.
- Start date and duration of the procedure.
- Materials, equipment and labour to be used.
- How materials, equipment and labour would be moved to and from the site as well as on site during construction.
- Storage, removal and subsequent handling of all materials, excess materials and waste materials of the procedure.
- Emergency procedures in case of any reasonably potential accident/incident which would occur during the procedure.
- Compliance/non-compliance with the EMPr specification and motivation if non-compliant.

Method statements (MS) required:

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

MS1: Site clearing
MS2: Site layout and establishment
MS3: Hazardous substances
MS4: Cement and concrete batching (for each operation)
MS5: Traffic accommodation
MS6: Solid waste control system
MS7: Wastewater control system
MS8: Erosion remediation and stabilisation
MS9: Fire control and emergency procedures
MS10: Alien vegetation clearing programme
MS11: Vegetation rehabilitation plan
MS 12: Construction works and management at Watercourse / wetland crossings

3.5. PUBLIC PARTICIPATION

It is recommended that an ongoing process of public participation be maintained to ensure continued involvement of interested and affected parties (IAPs) in a meaningful way.

Public meetings to discuss progress and any construction issues that may arise should be held at least every six months and more regularly if deemed necessary by the ER. These meetings should be convened and chaired by the Community Liaison Officer (CLO) that must be appointed by the Contractor and approved by the ER. A representative of the Client should also be present at these meetings.

The Contractor should present a progress report at each public meeting.

3.6 COMPLAINTS REGISTER

A complaints register must be available in an accessible place on site at all times. Each page must be numbered and all complaints signed by the Contractor to acknowledge the issues involved. The Contractor must ensure solutions are found to issues raised about the construction activities, within a month of the complaint being laid. If issues cannot be rectified they must be taken to the Committee meetings and alternative solutions discussed and put into play. The Contractor must present to the Committee all problems and solutions put forth in the previous weeks.

4. CONTROL OF CONSTRUCTION ACTIVITIES

4.1. SITE CLEARING

MS1: The Contractor must submit a site clearing method for all areas where the Contractor is required to, or intends to, clear vegetation, either within the road reserve or at the other designated construction areas outside the road reserve. The Method Statement will include:

- A clear indication of chainage or land reference;
- Details of any search and rescue and/or seed collection to take place;
- Which areas will be cleared;
- How these areas will be cleared; and
- How the cleared materials will be stored or disposed of.

4.1.1. Vegetation clearing

Any indigenous vegetation that is removed must be replanted under the guidance of the ECO and / or biodiversity specialist, the Harry Gwala District Municipality can provide a list of alternate sites should a no feasible alternate replanting site be located.

No vegetation clearing must take place without written approval of the Method Statement by the ER.

No vegetation clearing will take place until seed collection has been undertaken in the area, unless the area is not deemed suitable for seed collection.

Before clearing of vegetation, the Contractor must ensure that all litter and non-organic materials are removed from the area to be cleared.

Vegetation clearing must take place in a phased manner in order to retain vegetation cover for as long as possible. The time that stripped areas are exposed for must be minimised wherever possible.

Vegetation clearing in watercourses and wetland areas must be conducted by hand. No heavy machinery must be permitted in watercourses to clear vegetation. Vegetation cleared from watercourses must be removed from the watercourses immediately to prevent blocking of the watercourses.

All indigenous plant material removed from the cleared areas must be stockpiled for mulching. All remaining vegetation must be removed and disposed of at a Department of Environmental Affairs (DEA) licensed landfill site.

4.1.2. Topsoil

The Contractor must remove topsoil from all areas where topsoil will be impacted on by construction activities, including temporary activities such as storage and stockpiling areas, borrow areas and detours.
Stripped topsoil must be stockpiled in areas agreed with by the ER for later use in re-vegetation and must be adequately protected. The depth of the soil may vary and due to this reason the top 300mm of soil must be removed and preserved as topsoil.

Topsoil stockpiles must be convex and no more than 2m high. Stockpiles must be shaped in a convex shape so that no surface water ponding can take place.

Topsoil stockpiles must be protected from erosion by wind and rain by providing suitable stormwater and cut-off drains (approved by the ER) and/or the establishment of temporary indigenous vegetation.

Topsoil stockpiles must not be subject to compaction greater than 1 500 kg/m^2 and must not be pushed by a bulldozer for more than 50m.

Topsoil stockpiles must be monitored regularly to identify any alien plants. If any occur, they must be removed when they germinate to prevent contamination of the indigenous seed bank. Before topsoil is to be re-used the stockpiles must be analysed by a suitably qualified Landscape Contractor/Horticulturalist and, if necessary, be fertilised before use.

Any topsoil contaminated by hazardous substances must not be used but must rather disposed of at a registered landfill site.

The Contractor must be held responsible for the replacement, at his/her expense, of any unnecessary loss of topsoil due to his/her failure to work according to the approved Method Statement and the requirements of this EMPr.

4.2. MANAGEMENT OF SITE FACILITIES

The construction, layout and extent of the construction site and its components must be planned, designed and managed in such a manner that environmental impacts are minimised. Temporary structures and facilities must be decommissioned to the satisfaction of the ER and clean-up after construction must be effectively undertaken.

4.2.1. Site layout and establishment

The Contractor must establish construction camps, offices, workshops, testing facilities, stockpiling areas, staff accommodation etc. in a manner that does not adversely affect the environment and preferably in areas which have already been disturbed.

The construction areas must be kept to a minimum. Special care must be taken to screen highly reflective materials on site.

Site establishment must not take place on slopes with a gradient steeper than 1:3, within 50m (or 1:20 year floodline whichever is greater) of wetland areas and watercourses or sites declared as no-go areas (see 4.2.2 below).

The site layout must take cognisance of access for deliveries and services. Likely disturbance to neighbours as well as security implications must be considered. Any site establishment near any settlements must be discussed with and agreed to by the local community. These negotiations must be commissioned and chaired by the CLO.

MS2: Before construction can begin, the Contractor must submit to the ER for approval a Method Statement detailing:

- ***A layout plan and the method of establishment of the construction camp, i.e. all offices, accommodation facilities, testing facilities/laboratories, batching areas, storage and stockpiling areas, workshops, vehicle washing areas and all other areas/facilities required for the undertaking of activities required for completion of the project.***
- ***The plan must include the location and layout of waste storage and treatment facilities, ablution facilities, stockpiling and spoil areas and hazardous material storage areas. The demolition and removal of these facilities on completion of construction works must also be detailed.***
- ***If applicable, written agreement from any affected local community must be included.***

The Contractor must restrict all his activities, materials, equipment and personnel to within the area specified. The Contractor must ensure that the approved construction area will be adequate to cover the project without further space adjustments being required at a later date.

4.2.2. No-go areas

Areas where construction activities (including traffic accommodation) are prohibited are referred to as no-go areas. Entry into these areas by any person, vehicle or equipment without the ER's written permission will result in a penalty.

All declared no-go areas must be demarcated by temporary fencing (4.2.3), the position of which must be agreed to by the ER and the DEO, and appropriate signage.

All private property outside of the construction areas (including any detour routes) must be considered no-go areas. In addition, wetland areas identified by the Wetland Specialist and areas of natural vegetation identified by the Biodiversity Specialist during the Basic Assessment process are deemed to be no go areas unless they comprise part of the project approval footprint.

The ER may declare additional no-go areas at any time during the construction phase as deemed necessary and/or at the request of the ECO and/or the EMC.

Demarcation materials (fencing, signage, etc.) must not be moved or removed at any stage of the project without the written consent of the ER.

4.2.3. Temporary fencing

The Contractor must erect temporary fencing along the perimeter of designated no-go areas and potentially hazardous areas where appropriate and deemed necessary by the ECO. These sites must be clearly marked.

Temporary fencing must, as a minimum, consist of wooden or metal posts at 3m intervals, with two plain wire strands tensioned horizontally at heights of 300mm and 900mm above the ground, threaded with commercial type danger tape.

The Contractor must maintain in good order all demarcation fencing and barriers for the duration of construction activities, or as otherwise instructed.

4.2.4. Ablution facilities

Where water borne sewerage is not available, temporary chemical toilets must be provided by a company approved by the Engineer. These toilets must be a minimum distance of at least 50m away from the nearest water body / or out of the 1:20 year floodline, whichever is the greater.

The Contractor must be responsible for ensuring that all ablution facilities are maintained in a clean and sanitary condition to the satisfaction of the ER.

Ablution facilities (chemical toilets, etc.) must be provided at all construction camp areas or where there will be a concentration of labour. According to the Occupational Health and Safety Regulations (1993), a minimum of 1 toilet per 20 people must be provided and be serviced by a registered service provider. Toilet paper must be provided at all facilities.

Under no circumstances may open areas or the surrounding bush or degraded and built up areas be used as toilet facilities.

4.2.5. Eating areas

If none are available, the Contractor must provide adequate temporary shade within the construction areas to ensure that site personnel do not move off site to eat.

Eating areas should be regularly cleaned and serviced to ensure the humane standards of hygiene and cleanliness.

The Contractor must provide adequate refuse bins at all eating areas to the satisfaction of the ER.

If deemed necessary by the ER, the Contractor must demarcate designated eating areas.

No feeding of wild animals must be allowed.

4.2.6. Workshop, equipment maintenance and storage

All vehicles and equipment must be kept in good working order to maximise efficiency and minimise pollution.

All maintenance, including washing and refuelling of plant on site must take place at designated locations at the workshop area.

The Contractor must ensure that no contamination of soil or vegetation occurs around workshops and plant maintenance facilities.

All machinery servicing areas must be bunded.

Drip trays must be used to collect used oil, lubricants, etc. during maintenance. Drip trays must be provided for all stationary plant.

On site washing of equipment must be restricted to urgent maintenance requirements only.

Adequate wastewater collection facilities must be provided (4.5.3).

It is a requirement from Eskom that no machinery or construction activities are to occur within a 3m radius of any pole/stay wire, outside of this radius the soil must be suitable shaped and protected to not cause erosion.

4.2.7. General aesthetics

The Contractor must not deface, paint, damage or mark any natural feature (e.g. rocks, etc.) situated on or around the site for survey or any other purposes unless agreed beforehand with the ER. Any features, affected by the Contractor in contravention of this clause must be restored/rehabilitated to the satisfaction of the ER & ECO.

All construction areas must be kept neat and tidy at all times. Different materials and equipment must be kept in designated areas and storing/stockpiling must be kept orderly.

Lighting (if required) must be of the downward facing spill off type to prevent light pollution and impacts on the surrounding community.

4.3. MATERIALS HANDLING, USE AND STORAGE

The potential environmental impact of the handling, use, storage and disposal of materials used during construction must be minimised.

4.3.1. General

Environmental considerations (including proximity to houses and schools, prevailing wind conditions, proximity to water bodies, on site topography etc.) must be taken into account in the siting of any material storage areas. Storage areas must be secured so as to minimise access by the general public. Fire prevention facilities must be present at all storage facilities.

4.3.2. Transportation

The Contractor must ensure that all suppliers and their delivery drivers are aware of procedures and restrictions (e.g. no-go areas) in terms of this EMPr.

Materials must be appropriately secured to ensure safe passage between destinations during transportation. Loads must have appropriate cover to prevent them spilling from the vehicle during transit. The Contractor must be responsible for any clean-up

resulting from the failure by his employees or suppliers to properly secure transported materials.

4.3.3. Stockpiling

The Contractor must plan his activities so that materials excavated from borrow pits and cuttings, in so far as possible, can be transported directly to and placed at the point where it is to be used.

Should temporary stockpiling become necessary, the areas for the stockpiling of excavated imported material must be indicated and demarcated on the site plan submitted in writing to the ER for his approval (MS1), together with the Contractor's proposed measures for the prevention of containment and rehabilitation. Stockpiling should not be in the vicinity of any sensitive or high risk areas e.g. wetlands, watercourses, floodplains and steep slopes. Stockpiles must be a minimum distance of at least 50m away from the nearest water body / or out of the 1:20 year floodline, whichever is the greater.

Stockpiles must be positioned and sloped to create the least visual impact and to ensure they do not obstruct drivers' line of site.

Stockpiles must be well secured and stable to avoid collapse and possible injury.
No foreign material generated/deposited during construction must remain on site.
Areas affected by stockpiling must be reinstated to the satisfaction of the ER and the ECO.

4.3.4. Hazardous substances

All hazardous material/substances/chemicals (e.g. petrochemicals, oils, paints, bitumen, diesel etc.) must be listed on a Material Safety Data Sheet (MSDSs) which must be readily available on site. These MSDSs must include Human Health and Environmental and Spill Contingency Plans in the instance where humans come into contact with hazardous materials, or if hazardous materials are spilled in the environment. Staff dealing with hazardous substances must be aware of the danger of dealing with hazardous substances, as well as knowing the appropriate safety and mitigation measures involved.

On-site spill kits (e.g. Drizit) must be kept on site. These kits must be stored in readily available and well sign posted areas. In the event of a small scale spill, on-site spill kits

can be used. All personnel who will be handling the kits must be trained in the correct usage, as well as the action applicable to the spill type.

All storage areas for hazardous substances must be clearly signposted. Residents living adjacent to the construction site must be notified of the existence of the hazardous storage area.

All hazardous substances must only be stored under controlled conditions, in a secured, appointed area that is fenced, bunded with an impermeable liner to protect groundwater quality, and has restricted entry. All storage must take place using suitable containers of the approval of the ER. Hazard signs indicating the nature of the stored materials must be displayed on the storage facility or containment structure.

Fuel must be stored in a steel tank supplied and maintained by the fuel suppliers. The tanks must be located in a secure, demarcated area and an adequate bund wall (110% of the total volume of the tank) must be constructed around the storage area. The floor and wall of the bunded area must be impervious to prevent infiltration of any spilled/leaked fuel into the soil. Fuel tanks must be elevated to allow for early detection of leaks. No possible spillages or accumulated stormwater within this bunded area will be allowed to be flushed from the bund into the surrounding area. All fluids accumulated within the bunded area must be removed by a registered service provider and disposed of at an approved landfill site which is registered to deal with waste of this nature.

Waybills must be sourced from the service provider and be kept on site for inspection by the ECO during his/her audits.

In the instance that an accident or spillage of hazardous materials takes place, a copy of the Method Statement detailing action taken, must be provided to the ER, as well as the DWA.

Hazardous waste disposal must be carried out by an approved & licenced waste contractor.

MS3: The Contractor must provide a Method Statement detailing the hazardous substance/material that are to be used during construction, as well as the storage, handling and disposal procedures for each substance/material and

emergency procedures in the event of misuse or spillage that might negatively affect people or the environment.

4.3.5. Cement and concrete batching

Concrete mixing directly on the ground must not be allowed and must take place on impermeable surfaces or mixing boards to the satisfaction of the ER.

The concrete batching activities must be located in an area of low environmental sensitivity to be identified by the ER & ECO.

Lime and other powders must not be mixed during excessively windy conditions.

All runoff from batching areas must be strictly controlled and cement-contaminated water must be collected, stored and disposed of at a registered landfill site authorised to deal with these substances.

Contaminated water storage facilities must not be allowed to overflow and appropriate protection from rain and flooding must be implemented. The storage facilities must be in completely enclosed systems such as JoJo Tanks with adequate capacities.

Unused cement bags must be stored out of the rain where they will not be affected by runoff.

Used (empty) cement bags must be collected and stored in weatherproof containers to prevent wind-blown cement dust and water contamination. Used cement bags must not be used for any other purpose and must be disposed of on a regular basis at a registered landfill site.

All excess concrete must be removed from site on completion of concrete works and disposed of at a registered landfill site.

Washing of the excess concrete into the ground, and vehicles that have transported concrete to site, is not allowed.

All excess aggregate must be removed from the site and disposed of appropriately.

MS4: The Contractor must submit a Method Statement detailing cement storage, concrete batching areas and methods, method of transport of cement and concrete, storage and disposal of used cement bags and spill contingencies for each concrete batching operation.

4.3.7 Sourcing of materials

Contractors must prepare a source statement indicating the sources of materials (including topsoil, sands, natural gravels, crushed stone, asphalt, clay liners etc.) and submit these to the ER prior to commencement of any work.

Where possible, a signed document from the supplier of natural materials should be obtained confirming that they have been obtained in a sustainable manner and in compliance with relevant legislation.

Where materials are mined, proof must be provided with authorisation to utilise these materials from the landowner/mineral rights owner and the Department of Mineral Resources.

MS5: The Contractor must submit a Method Statement for approval detailing the source of all materials, as well as (where possible), a signed document from the supplier confirming the source of materials. In the instance where materials are mined, a Method Statement must be provided showing authorisation from the parties involved.

4.4. TRAFFIC ACCOMMODATION AND SITE ACCESS

The Contractor is required to ensure that traffic along the road is accommodated within the road reserve as far as is possible.

Any traffic accommodation outside the road reserve must utilise existing roads as much as possible.

No new bypass or traffic accommodation routes must be cleared or established without the approval of the ER.

All access roads must be planned and approved by the ECO and ER ahead of construction activities, and must not be created on an ad-hoc basis. Special note must be taken of indigenous and well established vegetation when planning the access

routes. No trees/shrubs/groundcover may be removed or stripped without the prior permission of the ECO.

All access roads must be maintained and kept in good condition by attending to potholes, corrugations and storm water damage. The contractor must ensure that all side and mitre drains and scour check walls on accesses and haul roads are functioning properly and are well maintained.

Construction vehicles must be restricted to demarcated areas, haulage routes and turning areas. No turning manoeuvres, other than at designated places, must be permitted.

MS6: The Contractor must submit a Method Statement for approval detailing how traffic is to be accommodated along the road during construction. Cognisance must be taken of No-Go areas within the road reserve, as well as the utilisation of existing public and farm roads where possible. Details should include stop-go locations, estimated delays, start date and duration, as a minimum. All roads must be kept in good condition and be maintained.

4.5. WASTE MANAGEMENT

Waste management on site must be strictly controlled and monitored. Only approved waste disposal methods must be allowed.

The Contractor must ensure that all site personnel are instructed in the proper disposal of all waste.

4.5.1. Solid waste

The Contractor must ensure that all facilities are maintained in a neat and tidy condition and the site must be kept free of litter. Measures must be taken to reduce the potential for litter and negligent behaviour with regard to the disposal of all refuse. The working site must be cleared of all litter at the end of each working day. At all places of work the Contractor must provide litter bins, containers and refuse collection facilities for later disposal at a registered landfill site. Where possible, separate waste receptacles (for example glass, plastic, organic material etc.) must be provided to allow for recycling. Staff must be made aware of these separate receptacles, and the advantages and benefits of recycling.

Solid waste may be temporarily stored on site in a designated area approved by the ER prior to collection and disposal. Waste storage containers must be covered, tip-proof, weatherproof and scavenger proof, and where possible, have rubbish bin liner bags for efficient control and disposal of waste. The waste storage area must be fenced off to prevent wind-blown litter.

No burning, on-site burying or dumping of waste is allowed.

All solid waste must be disposed of off-site at a registered landfill site. The Contractor must supply the ER with the Waybills for these disposals who will keep them on record for the duration of the project.

MS7: The Contractor must submit a Method Statement detailing a solid waste control system (storage, provision of bins, site clean-up schedule, bin clean-out schedule and point of disposal as a minimum) to the ER for approval.

4.5.1.1. Domestic waste

The Contractor must provide metal refuse bins or equivalent plastic refuse bins, all with lids, for all buildings. Refuse must be collected and removed from all facilities at least once a month, or as required by the ECO. Domestic waste must be transported to a registered landfill site for disposal in covered containers or trucks.

The excavation and use of rubbish pits, as well as the burning of waste is forbidden.

4.5.1.2. Construction rubble/waste

Inert construction rubble will be disposed of in pre-agreed, demarcated spoil dumps that have been approved by the ER. Asphalt residue does not constitute “inert construction rubble or waste materials”. It is classified as a hazardous waste and must be disposed of at a registered landfill site that has the capacity to deal with hazardous waste.

4.5.1.3. Scrap metal

Scrap metal must be disposed of off-site at a registered landfill site. Waybills of this disposal must be submitted to the ER for record keeping.

4.5.2. Hazardous waste

All hazardous waste (including bitumen, paint and all petrochemicals) must be disposed of at a registered hazardous landfill site by an approved waste contractor. The Contractor must provide the ER with the appropriate Waybills for record keeping.

Used oil and grease must be removed from site and disposed of at a registered hazardous landfill site.

Used oil, lubricants and other cleaning materials from the maintenance of vehicles and machinery must be collected in holding tanks and sent back to the supplier or removed from site by a specialist oil recycling company for disposal at a registered hazardous landfill site.

Spills in bunded areas must be cleaned up, removed and disposed of by a registered service provider, as soon after detection as possible, to minimise pollution risk and reduced bunding capacity.

4.5.3. Wastewater

Water from kitchens, showers, laboratories and other washing areas must be discharged into a conservancy tank for removal from the site by a registered service provider.

Runoff from fuel depots, workshops, machinery washing areas and concrete batching areas must be collected into a conservancy tank and disposed of at a site approved by the ER. If the runoff contains petrochemicals (diesel, petrol, oil and grease) it must be collected by a registered service provider and disposed of at a registered landfill site capable of dealing with waste of this nature.

MS8: The Contractor must submit a Method Statement to the ER detailing how wastewater would be collected from all wastewater generating areas, as well as storage and disposal methods. If the Contractor intends to carry out any on-site wastewater treatment, this should also be included. Please note that if wastewater treatment plants are to be erected they will require licensing under the Waste Act of 2008 (Act 59 of 2008), the costs and responsibilities for such an application will be carried by the Contractor.

4.6. NOISE CONTROL

The Contractor must endeavour to keep noise generating activities to a minimum.

The Contractor must restrict all operations that result in undue noise disturbance to local communities and/or dwellings (e.g. blasting and crushing) to daylight hours on workdays (Monday to Saturday) or otherwise agreed with the ER.

The Contractor must warn any local communities and/or residents that could be disturbed by noise generating activities such as blasting, well in advance and must keep such activities to a minimum.
The Contractor is responsible for compliance with the relevant legislation with the respect to noise.

4.7. AIR QUALITY

The Contractor must ensure that the generation of dust is minimised and must implement a dust control programme to maintain a safe working environment, minimise nuisance for surrounding residential areas/dwellings and prevent damage to natural vegetation, crops etc.

Construction vehicles must comply with speed limits and haul distances must be minimised. Material loads must be suitably covered and secured during transportation.

Exposed soils and material stockpiles must be protected against wind erosion. The location of stockpiles must take into consideration the prevailing wind directions and locations of sensitive receptors.

The Contractor must implement dust suppression measures (e.g. Water spray vehicles, covering material stockpiles, etc.) if and when required.

If an extensive amount of workers are to be staying in the construction camp, an alternative arrangement (other than fire) must be made for cooking and heating requirements, to prevent the smoke pollution reaching excessive levels for the surrounding homes. LPG gas cookers may be used, provided that all safety regulations are followed. Under no circumstances are staff allowed to cut down surrounding vegetation to provide wood for fires.

Vehicles and machinery are to be kept in good working order and must meet manufacturer's specifications for safety, fuel consumption etc. Should excessive emissions be observed, the Contractor is to have the equipment seen to as soon as possible.

4.8. SOIL EROSION AND SEDIMENTATION CONTROL

4.8.1. During construction

The Contractor must, as an ongoing exercise, implement erosion and sedimentation control measures to the satisfaction of the ER.

During construction, the Contractor must protect all areas susceptible to erosion by installing necessary temporary and permanent drainage works as soon as possible and by taking any other measures necessary to prevent stormwater from concentrating in streams and scouring slopes and steep banks.

To, prevent erosion, battering of all embankments must be such that cut and fill embankments are no steeper than previous natural slopes unless otherwise permitted by the ER. Cut and fill embankments steeper than previous ground levels must be re-vegetated immediately on completion of trimming, or must be protected against erosion via measures listed hereunder. All embankments, unless otherwise directed by the ER, must be protected by a cut off drain to prevent water from cascading down the face of the embankment and causing erosion.

Any runnels or erosion channels developed during the construction or maintenance period must be backfilled and compacted and the areas restored to a proper condition similar to the condition before the erosion occurrence.

Stabilisation of cleared areas to prevent and control erosion and/or sedimentation must be actively managed. The method of stabilisation must be determined in consultation with the ER. Consideration and provision must be made for the following methods (or combination thereof):

- Brushcut packing;
- Mulch or chip cover;
- Straw stabilising;
- Watering, planting or sodding;
- Soil binders;
- Anti-erosion compounds;

- Mechanical cover;
- Geotextiles; and
- Packing structures (including the use of geotextiles, log/pole fencing and gabion baskets).

Traffic and movement over stabilised areas must be restricted and controlled and damage to stabilised areas must be repaired and maintained to the satisfaction of the ER.

In areas where construction activities have been completed and where no further disturbance would take place, topsoiling, re-vegetation and rehabilitation should commence as soon as possible.

4.8.2. Remediation of existing eroded areas

The Contractor must be required to undertake actions to correct and stabilise existing areas of erosion along the road, within the road reserve and outside the road reserve if the source of the erosion originates within the road reserve.

MS9: The Contractor must submit a Method Statement to the ER for approval detailing the method of erosion remediation and stabilisation in each of these areas.

4.9. WORK IN WETLAND AREAS

No work may occur within the watercourse areas until such time as the relevant environmental authorisations have been obtained from the EDTEA.
If approval is received, any conditions included in the EA relating to working in wetland, must be complied with.

The recommendations put forward by the Wetland Specialist during the Basic Assessment process must be complied with. These include:

Additional care must be taken to ensure that the road works do not in any way impact on the stream. The presence of marker poles within the actual stream channel is of concern if they are there to indicate the edge of the road embankment. However, if they are simply distance markers and the road is to remain in its present footprint then

there is simply a need to ensure that the road is well stabilised. The following recommendations are put forward:

- No material may be allowed to slip or fall into the stream at any point.
- It is preferred that some hard structures, such as a mesh or gabions, be used since goats and other animals are likely to denude and trample a soft bank.
- No stockpiling or spoiling of any materials may be done anywhere within the designated riparian zone or within 30 m of the stream.
- No stockpiling or spoiling of any materials may be done anywhere in the grasslands to the west of the road.
- While the gradient of the stream at the crossing is low, provision must be made for energy absorption in the channel below the pipe or culvert.

All wetland areas must be protected from erosion and direct or indirect spills of pollutants, e.g. sediment, refuse, sewage, cement, oils, fuels, chemicals, wastewater and bituminous products.

In the event of a spill, the Contractor must take prompt action to clear polluted areas and prevent spreading of the pollutants. The Contractor must be liable to arrange for professional service providers to clear affected areas, if required.

Any work requiring the fording of wetland areas by machinery and vehicles must be undertaken at slow speed and with clean vehicles (no hydraulic fuel, oil or other fuel leakages) and along a single track.

Drip trays must be used for all pumps, generators or other stationary equipment that will be used in wetland areas in order to prevent water contamination as a result of fuel spillages or leaks.

MS10: The Contractor must submit a watercourse modification Method Statement to the ER for approval, detailing the steps to be undertaken in all locations, details of the modification/diversion, erosion and sedimentation control measures, surface water flow diversions and the rehabilitation process to take place.

4.9.2. Protection of surface water quality

The Contractor must ensure uninterrupted flow of clean surface water past the construction works to the satisfaction of the ER and the ECO. This must be done by diverting surface water flow or piping the surface flow past the works. No watercourse may be diverted, dammed or modified without the approval of the Method Statement (10) by the ER.

Contaminated water (silt-laden, cement-contaminated, etc.) pumped from the construction area must be pumped into settlement ponds and not straight back into the watercourse or wetland areas. Water must not be pumped from the settlement ponds into the river without the approval of the ER.

Washing of clothes and equipment, bathing and swimming in rivers, streams and dams, is strictly forbidden.

4.9.3 Stormwater Management

To prevent stormwater damage, the increase in stormwater runoff, resulting from construction activities must be estimated, and the drainage system designed accordingly.

The use of high velocity stormwater pipelines should be avoided in favour of open, high friction, semi-permeable channels wherever feasible.

A number of smaller stormwater outfall points should be constructed rather than a few large outfall points. Stormwater outfalls should be designed to reduce flow velocity and avoid stream banks and soil erosion.

A periodic checking of the sites drainage systems must be undertaken to ensure that water flow is unobstructed.

Under no circumstances can waste rubble be placed in drainage lines, stormwater channels and rivers.

Stormwater discharge along the site should not be increased with the construction activities of the water supply scheme. Retention ponds may need to be implemented where flow volumes are too high. Retention ponds should be vegetated with

indigenous, preferably wetland vegetation. The retention ponds must not block the flow of water, but should reduce flow velocity and encourage filtration.

During construction, un-channelled flow must be controlled to avoid soil erosion. Where large areas of soil are left exposed, re-vegetation must take place. In the instance that this is not possible, mulch, vegetative matter or grass/straw/hay (generated during on site clearance) must be dug into the unvegetated areas to slow surface wash and capture eroded material.

Where surface runoff is concentrated (e.g. along exposed tracks), flow should be slowed by contouring with hay bales or bundled vegetation (generated through on site clearance), or by inserting water directing 'speed' humps/berms, along the track to channel water into small retention ponds or areas designed to reduce flow and increase sediment capture.

4.10. PROTECTION OF INDIGENOUS VEGETATION

The Contractor must be responsible for informing all employees about the need to prevent any harmful effects on indigenous vegetation on or around the construction site as a result of their activities.

Clearing of indigenous vegetation must be kept to a minimum. The removal, damage and disturbance of indigenous vegetation without the written approval of the ER, is prohibited.

Before vegetation clearing takes place in any construction area, search and rescue and seed collection must be undertaken.

The use of herbicides is prohibited unless approved by the ER.

The Contractor must ensure that any threatened and endangered species along the alignment be transplanted to areas outside of the current road alignment.

Indigenous vegetation that cannot be relocated but can remain on site must be clearly demarcated (by fencing and/or danger tape) to prevent damage by plant and machinery. This fencing can be re-used, and moved in phases as construction progresses, where necessary.

4.11. PROTECTION OF FAUNA

The Contractor must ensure his employees do not undertake any hunting, trapping, shooting, poisoning or other disturbance of any fauna on-site or in the areas surrounding the road reserve.

The feeding of any wild animals is prohibited.

The use of pesticides is prohibited unless approved by the ER.

No domestic pets or livestock are permitted on site.

4.12. FIRE CONTROL

The Contractor must take all reasonable steps to decrease the risk of fire, through activities, on site.

The Contractor must ensure that basic fire-fighting equipment is available at all construction activities on site.

The Contractor must appoint a fire officer who must be responsible for ensuring immediate and appropriate action in the event of a fire.

The Contractor must ensure that all site personnel are aware of the procedure to be followed in the event of a fire.

MS12: The Contractor must submit a fire control and fire emergency Method Statement to the ER for approval. The Method Statement must detail the procedures to be followed in the event of a fire and the name of the appointed fire officer.

Any work that requires the use of fire may only take place in a designated area approved by the ER and must be supervised at all times. Fire-fighting equipment must be available at all times.

4.13. WATER PROVISION

The Contractor must make available safe drinking water fit for human consumption at the site offices and all other working areas.

All drinking water must be from a legal source and comply with recognised standards for potable use. The Contractor must comply with the provisions of the National Water Act, 1998 (Act 36 of 1998) and its Regulations pertaining to the abstraction of waters from rivers and streams and the use thereof.

If water is stored on site, drinking water and multi-purposed water storage facilities must be clearly distinguished and demarcated.

4.14. PROTECTION OF HERITAGE AND CULTURAL FEATURES

If any archaeological or paleontological artefacts or remains are uncovered during earthmoving activities, work in the vicinity of the find must cease immediately. The Contractor must immediately notify the ER, who must contact AMAFA, who will take appropriate steps.

The Contractor will be required to abide by the specifications as set out by SAHRA or the heritage specialist appointed to investigate the find.

The Contractor must acquire a permit, issued by the relevant heritage resources authority, in the instance that any destruction, damage, excavation, alteration, defacing or any other disruption are to take place to any archaeological material.

5. ALIEN VEGETATION CLEARING PROGRAMME

5.1. GENERAL REQUIREMENTS

MS13: The Contractor must liaise with DEA's Working for Water Programme (or another experienced organisation approved by the ER) in compiling and implementing an alien vegetation clearing programme (AVCP), which must indicate eradication areas, vegetation types, method of eradication, an order of priority for all the actions to be undertaken and disposal of the collected plant material. The AVCP must be submitted to the ER for approval and only pertain to the areas within the road reserve, borrow pits and all areas that are disturbed by the Contractor for any purpose associated with the construction project.

The Contractor must ensure that unskilled labour for vegetation eradication is sourced from the local labour database to be drawn up in conjunction with the local Public Steering Committee (PSC).

The AVCP must comprise specifications on the biological, mechanical, and chemical control methods as required for the management of the alien species.

The AVCP must provide for short, medium and long-term eradication and maintenance programmes for this project. The programme must include the following phases:

- Initial control (reduction of existing population).
- Follow-up control (control of seedlings after initial eradication).
- Maintenance control (longer term monitoring and eradication of alien vegetation in areas that have been cleared) for the duration of the contract period).

The Contractor must ensure that cognisance is taken of the possibility of fire hazards and the spread of alien vegetation seeds released when mature vegetation is chopped down.

The AVCP should also include the safe, effective disposal of removed vegetation. This is particularly important in terms of stormwater management. Removed vegetation must be disposed of at a registered landfill site and waybills collected to present to the ER for record keeping.

5.2. GENERAL ERADICATION GUIDELINES

All alien vegetation within the road reserve must be cleared. If any alien vegetation clearing is required within No-Go areas, this must not take place without the written approval of the ER and must be undertaken under supervision of the DEO. Special care must be taken to protect indigenous vegetation in No-Go areas from trampling, herbicide drift or any other activity that might impact on them.

The use of herbicides is encouraged in preference to vehicle-driven brush cutting and grading. No herbicide use will however be allowed within streams, rivers or other drainage lines / wetlands. Written confirmation must first be gained from the ER for the use of herbicides.

All trees and saplings need to be cut down at ankle height where possible and herbicides applied immediately after cutting. Cutting without the use of herbicide treatment would stimulate re-growth.

Eradication must start in the least infected areas and from highest lying areas.

Herbicides must not be applied when conditions are windy, so as to avoid spray drift.

No herbicides should be applied when rain is forecast within two days.

Protective clothing and masks must be worn at all times during application of herbicides.

Colour dyes must be used with the herbicides to clearly mark areas that have been treated.

Herbicide drift onto other plants must be avoided and care must be taken not to trample indigenous vegetation or stack alien vegetation on top of it.

Workers must always read and follow the instructions on the labels of herbicides and make sure that the employees that will be working with these substances are familiar with its uses and application methodology.

Unused herbicides and empty herbicide containers must not be disposed of on site, but collected, stored at a point on site approved by the ER and disposed of by a registered service provider at a registered landfill site capable of receiving hazardous materials such as this. Waybills must be collected and provided to the ER for record keeping.

The spraying of herbicides/pesticides must comply with the Occupational Health and Safety Act (OHSA) specs and other chemical handling laws. Areas that are to be treated with herbicides must first be confirmed with the ER.

6. VEGETATION REHABILITATION

6.1. GENERAL

All areas disturbed by construction activities, including borrow pits, temporary bypasses, storage and stockpiling areas, etc. must be rehabilitated to the satisfaction of the ER.

Hydroseeding / hydromulching is expected to be the most suitable method of re-vegetation for most areas.

All plants/trees used in re-vegetation must be locally indigenous species only.

Avoidance is preferred over translocation and search and rescue should be undertaken only for plants/trees for which translocation is likely to be successful.
Re-vegetation of construction areas must take place as soon as possible after completion of construction works. The timing of re-vegetation must take cognisance of maintenance requirements and provision must be made for any irrigation requirements.

No construction equipment, vehicles or unauthorised personnel must be allowed onto areas that have been re-vegetated.

6.2. SEED COLLECTION AND STORAGE

Indigenous seed must be harvested from areas that are free of alien vegetation, either within construction areas prior to site clearing or from suitable neighbouring areas with the consent of the relevant landowners.

Harvested seed must be free of excessive quantities of organic and/or substrate material.

If it is required to collect seed from selected species by hand, this seed must be treated and stored separately.

Following harvesting, seed must be dried under cool airy conditions. Seed must be insect-free and must be stored in suitable containers under cool conditions that are free of rodents or insects. No wet, mouldy or otherwise damaged seed is acceptable.

The Contractor must provide adequate facilities for the storage of collected seed in rodent- and insect-free, cool, dry conditions to the satisfaction of the ER.

Seed collection must be an ongoing exercise throughout the construction period (at least twice a year) in order to ensure that sufficient seed is collected for use in re-vegetation.

Only if the harvested seed quantities are not sufficient may additional seed be bought. Any procurement of seed for use in re-vegetation must be from reputable sources only. The seed mix quantities and purity levels must be as specified in the approved method statement.

6.3. SEARCH AND RESCUE

Search and rescue of all rare or localised plant species within construction areas must be undertaken before any site clearing takes place. Search and rescue must include the collection of plants, cuttings and, where applicable, seed.

Search and rescue of seed and cuttings for propagation purposes may be undertaken within No-Go areas under the supervision of the DEO.

Rescued plant material must either be planted nearby within suitable habitats in areas that will not be disturbed in the foreseeable future, or at a nursery.

The Contractor must provide nursery facilities for the holding of any rescued plant material that is deemed suitable for later use in re-vegetation to the satisfaction of the ER.

6.4. NURSERY

The establishment of an on-site nursery to propagate and supply indigenous plants for use in re-vegetation is preferred to the procurement of plants / trees from commercial sources.
Nursery plants must be grown from locally obtained seed, cuttings and plants.

The use of plants/trees bought from commercial sources in re-vegetation of specific areas (e.g. water courses) or for use in propagation at the nursery may be allowed if approved by the ER.

All plant material must be obtained from reputable nurseries and must be locally indigenous species only.

6.5. MULCH

Mulch must be used in all areas where re-vegetation has to take place. Mulch must be obtained from all areas where vegetation is cleared, after removal of alien vegetation and search and rescue of conservation-worthy species.

Mulch must be free of alien species.

Plant material must be reduced by either mechanical means (chipper) or by hand-axing to pieces no longer than 100mm.

No harvesting of mulch vegetation outside of construction areas must be allowed.

Every effort must be taken to ensure the retention of as much seed as possible in mulch made from indigenous vegetation. Mulches must be collected in such a manner that the loss of seed is restricted.
Brush-cut mulch must be stored for as short a time-period as possible, and seed released from stockpiles must be collected for use in re-vegetation.

Compost from a local source may be used as mulch during re-vegetation, but must be approved by the ER. Compost must be well decayed, friable and free from weed seeds. Seed free, half-composted material, such as mulled-bark, may be used as an additive to extend indigenous mulch. No more than 50% compost must be used under these circumstances.

Wood chips (including bark), which are half composted and have not been treated with preservatives can also be used as mulch during re-vegetation. Wood chips must only be obtained from indigenous species removed during site clearing of construction areas. Chips must be no longer than 50mm in length or breadth and the ER must approve the source of the chips.

6.6. FERTILISER

The use, storage and handling of fertiliser must be strictly controlled by the Contractor.

Fertilisers must be suitably stored in sealed containers in areas approved by the ER.

Care must be taken when using fertilisers near No-Go areas, watercourses and wetland areas and other sensitive natural areas.

Soil must be well watered and moist before any fertiliser is applied.

6.7. LANDSCAPING AND GROUND SURFACE PREPARATION

Cut and fill slopes must be shaped and trimmed to reflect the natural condition and contours as closely as possible. Cut and fill slopes must be left as rough as possible and must be shaped to contain ridges that would facilitate the accumulation of topsoil.

Prior to re-vegetation, the Contractor must ensure that the area is clear of any building materials and other foreign debris.

All visible weeds must be removed from the area before replacing topsoil. Compacted soil must be ripped along the contour and hand-trimmed, topsoil must then be spread evenly over the surface.

The final prepared ground surface must be furrowed to follow the natural contours of the land.

6.8. PLANTS / TREES

The handling, maintenance and planting of plants/trees must be undertaken under supervision of an appointed landscape architect/horticulturist/environmental scientist.

The Contractor must ensure that each plant/tree is handled and packed in the approved manner for that species or variety, and that all necessary precautions are taken to ensure that the plants arrive on site in a proper condition for successful growth.

Plants must be protected from wind during transportation.

No plants with exposed roots must be subjected to prolonged exposure to drying winds and sun, or subjected to water logging or force-feeding.

The Contractor must ensure that the plants are in a good condition and free from plant diseases and/or pests. The Contractor must immediately remove plants containing any diseases and/or pests from the site.

All plants supplied by the Contractor must be healthy, well formed, and well rooted. Roots must not show any evidence of having been restricted or deformed at any time. The potting materials used must be weed free.
There must be sufficient topsoil around each plant to prevent desiccation of the root system.

6.9. TIMING

Re-vegetation of disturbed construction areas must take place as soon as possible after construction work is completed.
As much as is possible, re-vegetation must take place at the start of the summer rains to maximise water availability and minimise the need for watering.

If re-vegetation takes place during the dry season, irrigation of planted areas may be necessary.

6.10. ESTABLISHMENT OF VEGETATION

6.10.1. Irrigation

The Contractor must be responsible for maintaining the desired level of irrigation necessary to maintain vigorous and healthy growth, as advised by the appointed landscaping contractor/horticulturist.

Water used for the irrigation of re-vegetated areas must be free of chlorine and other pollutants that will have a detrimental effect on the plants.

Where an irrigation system is required, the Contractor is responsible for its installation prior to seeding or planting. The Contractor must supply all required water as well as all equipment as required by the approved Method Statement.

Every effort must be made to avoid irrigation overspray into No-Go areas and other areas with natural vegetation.

6.10.2. Weed, Disease and Pest Control

The Contractor must be responsible for ensuring that all re-vegetated areas remain free of all alien and indigenous weed species during the contract and establishment period.

Weeding, removal methods and storage of this material must be undertaken in such a manner that prevents the re-infestation of the cleaned areas.

All dead plant material must be removed immediately (as it may become a fire hazard) and disposed of at a registered landfill site.

The Contractor must ensure that all plants are disease and pest free. Any methods used to control any diseases and/or pests, including the use of herbicides and pesticides, must be approved by the ER.

6.10.3. Tree establishment

Trees that die or become diseased so that they appear to be in a badly impaired condition must be promptly removed and replaced as soon as possible.

Trees must be kept free from dead wood, broken branches, etc.

7. SITE CLOSURE

The contractor must ensure that when the construction activities are completed, that all site closure specifications are followed.

7.1. CONSTRUCTION CAMP REHABILITATION

All structures comprising the construction camp are to be removed from site. The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint, fuels etc. These are to be cleaned up and taken to a registered hazardous/general waste landfill site.

All hardened surfaces within the construction camp and surrounding areas, must be ripped, where necessary and areas must be topsoiled and revegetated.

7.2. LAND REHABILITATION

Surfaces are to be cleared of all waste products from activities such as asphalting and concreting and disposed of in a hazardous landfill site. This is to be done to the satisfaction of the ECO.

All watercourses and wetland areas are to be free of building rubble, spoil, waste material etc. Under no circumstances are these materials to be buried on site.

The site is to be cleared of all litter.

7.3. REMOVAL OF BARRIERS AND REMEDIATION OF DAMAGE

Fences, demarcations and barriers associated with the construction activities are to be removed from site unless stipulated otherwise by the ER.

All residual stockpiles must be removed to spoil, be spread on site as directed by the ER, or be sent to a registered landfill site.

All leftover materials must be removed from site and returned to the depot.

The Contractor must repair any damage caused to neighbouring properties by the construction workers. This cost must be borne by the Contractor.

7.4. GENERAL REMEDIATION

A meeting is to be held on site between the ECO, ER and the Contractor to ensure that all rehabilitation and remediation tasks have been completed to the standard and satisfaction of the ECO.

All areas where temporary services were installed e.g. roadworks, are to be closed and rehabilitated, to the satisfaction of the ER. Access or haulage roads that have been built across watercourses must be rehabilitated by removing temporary bridge, road and culvert structures, and any other materials that were placed in close proximity to the watercourse. Re-vegetation of watercourses and wetlands, and stabilisation of the banks and river beds, must be implemented to the satisfaction of the ER.

8. NON-COMPLIANCE

8.1. PROCEDURES

The Contractor must comply with all of the environmental specifications and requirements on an on-going basis and any failure on his part to do so will entitle the ER to impose a penalty.

In the event of non-compliance the following recommended process can be followed:

- The ER must issue a notice of non-compliance to the Contractor, stating the nature and magnitude of the contravention. A copy must be provided to the ECO during his/her site audit.

- The Contractor must act to correct the non-conformance within 24 hours of receipt of the notice, or within a period that may be specified within the notice.
- The Contractor must provide the ER with a written statement describing the actions to be taken to discontinue the non-conformance, the actions taken to mitigate its effects and the expected results of the actions. A copy must be provided to the ECO.
- In the case of the Contractor failing to remedy the situation within the predetermined time frame, the ER must provide a non-compliance certificate on the conditions of contract.
- In the case of non-compliance giving rise to physical environmental damage or destruction, the ER must be entitled to undertake or to cause to be undertaken such remedial works as may be required to make good such damage and to recover from the Contractor the full costs incurred in doing so.
- In the event of a dispute or difference of opinion between any parties arising out of the interpretation of the conditions of the EMPr, or a disagreement regarding the implementation or method of implementation of conditions of the EMPr, any party must be entitled to require that the issue be referred to specialists for arbitration.

8.1.1. Indicative List of Transgressions

Where the Contractor and/or his/her Sub-contractor(s) inflicts non-repairable damage upon the environment or fail to comply with any of the environmental specifications, he/she must be liable to pay a penalty fine over and above any other contractual consequences.

The Contractor is deemed not to have complied with this EMPr if:

- Within the boundaries of the site, site extensions and haul/access roads there is evidence of contravention of the EMPr;
- Environmental damage ensues due to negligence on the Contractor's and/or his/her Sub-contractor's part;
- The Contractor and/or his/her Sub-contractor fail to comply with the corrective or other instructions issued by the ER within a specific time;
- The Contractor and/or his/her Sub-contractor fail to respond adequately to complaints from the public.

Payment of any fines in terms of the contract must not absolve the offender from being liable from prosecution in terms of any law.