



The Proposed Compensation Industrial and Business Estate

Final Environmental Management Programme

Amended November 2012

Tongaat Hulett Developments
January 2013



DOCUMENT DESCRIPTION

Client:

Tongaat Hulett Developments

Project Name:

Environmental Management Programme for the
Proposed Compensation Industrial and Business
Estate

SSI Environmental Reference Number:

E02.DUR.000174

Authority Reference:

DC29/0020/09

Compiled by:

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Date:

August 2012

Location:

Compensation/ Ballito

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Signature

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TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	PURPOSE	1
1.2	PROJECT PROPONENT	1
1.3	OBJECTIVE OF THE EMPRR	1
2	LEGAL REQUIREMENTS	1
3	FUNCTIONS AND RESPONSIBILITIES	2
3.1	THE PROJECT PROPONENT / PROJECT MANAGER	2
3.2	THE SITE MANAGER/ ENGINEER	2
3.3	THE CONTRACTOR	3
3.4	THE ENVIRONMENTAL CONTROL OFFICER (ECO)	3
4	ENVIRONMENTAL MANAGEMENT PROGRAMME	3
4.1	ADMINISTRATION REQUIREMENTS	5
4.2	LAYOUT AND SITE ESTABLISHMENT (CONSTRUCTION CAMP)	6
4.3	SITE ACCESS	8
4.4	VEHICLE MAINTENANCE YARD AND SECURED STORAGE AREAS	9
4.5	POLLUTION CONTROL MEASURES	10
4.6	SOLID WASTE MANAGEMENT	12
4.7	SPOIL AND TOPSOIL AND EROSION	14
4.8	WATER MANAGEMENT	15
4.9	WETLAND MANAGEMENT	18
4.10	WETLAND REHABILITATION	20
4.11	AIR QUALITY	24
4.12	NOISE	24
4.13	PROTECTION OF FAUNA AND FLORA	24
4.14	EXCAVATIONS	25
4.15	PUBLIC SAFETY	26
4.16	COMPLAINTS AND ENVIRONMENTAL INCIDENT REGISTER	27
4.17	SOCIAL IMPACTS	27
4.18	MONITORING, REPORTING AND RECORD KEEPING	28
4.19	EMERGENCY PROCEDURES	29
4.20	REHABILITATION	30
4.21	MONITORING AND MAINTENANCE	30
5	ENVIRONMENTAL CODE OF CONDUCT	32



	List of Tables	
	TABLE 4-1: ENVIRONMENTAL MANAGEMENT PLAN	5
	Terms and Abbreviations	
	DWAF - Department of Water Affairs and Forestry	
DAEA - Department of Agriculture and Environmental Affairs		
EMPR - Environmental Management Plan		
ECO - Environmental Control Officer		

1 INTRODUCTION

1.1 Purpose

In terms of The Constitution of the Republic of South Africa (Act No. 108 of 1996) everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for benefit of present and future generations, through reasonable legislation and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. The needs of the environment as well as affected parties should thus be integrated into overall project management. The Environmental Management Programme (EMPr) provides a tool for meeting this objective. It also ensures that management of construction activities meets the requirements of existing environmental legislation.

1.2 Project Proponent

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1.3 Objective of the EMPr

The objective of this document is to:

- Encourage good management practices through planning and commitment to environmental issues;
- Define how the management of the environment is reported and performance evaluated;
- Provide rational and practical environmental guidelines to:
 - Minimise disturbance of the natural environment; and
 - Prevent or minimise all forms of pollution.

2 LEGAL REQUIREMENTS

Construction will be according to the best industry practices, as identified in the project documents. This EMPr, which forms an integral part of the contract documents, informs the contractor as to his / her duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of environmental impacts caused by construction activities associated with the project. The contractor should note that obligations imposed by the EMPr are legally binding in terms of environmental statutory legislation and in terms of the additional conditions to the general conditions of contract that pertain to this project. In the event that any rights and obligations contained in this document contradict those specified in the standard or project specifications then the latter will prevail.

It is expected that the contractor is conversant with all legislation pertaining to the environment, including provincial and local government ordinances, which may be applicable to the contract. Some of the environmental

legislation applicable to the construction, upgrading and resealing of roads include, but are not limited to, the following legislation:

- Environmental Conservation Act, 1989 (Act 73 of 1989);
- National Environmental Management Act, 1998 (Act No. 107 of 1998);
- Atmospheric Pollution Prevention Act, 1965 (Act 45 of 1965);
- National Environmental Management: Air Quality Act (Act 39 of 2004);
- The National Water Act, 1998 (Act 36 of 1998);
- The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983);
- National Forest Act (Act No. 84 of 1998);
- Agricultural Pests Act (Act No. 36 of 1983);
- National Veld and Forest Fire Act (Act No. 101 1998); and
- National Environmental Management: Protected Areas Act 57 of 2003

3 FUNCTIONS AND RESPONSIBILITIES

Formal responsibilities are necessary to ensure that key procedures are executed. Specific responsibilities of the Project Proponent, Project Manager, Site Manager/Engineer and Contractor/Operator are as detailed below.

3.1 The Project Proponent / Project Manager

- Ensure that the Site Manager/Engineer and the Contractor/Operator are aware of all specifications, legal constraints, standards and procedures pertaining to the project specifically with regard to the environment;
- Ensure that all stipulations within the EMPR are communicated and adhered to by Site Manager/Engineer and the Contractor/Operator;
- Monitor the implementation of the EMPR throughout the project by means of regular site visits and meetings; and
- Order the removal of any person(s) and/or equipment in contravention of the specifications of the EMPR.

The Project Manager should be fully conversant with the Environmental Impact Assessment Report (EIR) for the project, the EMPR for the project, as well as all applicable environmental legislation (see Section 2 for list of potential applicable legislation).

3.2 The Site Manager/ Engineer

- Be fully conversant with the EIR;
- Be fully conversant with the EMPR;
- Be fully conversant with all environmental legislation and ensure compliance (see Section 2);
- Have overall responsibility for the implementation of the EMPR;
- Liaise with the Project Manager and Contractor/Operator on matters concerning the environment;
- Prevent actions that will harm or may cause harm to the environment, and take steps to prevent pollution on the site;
- Implement remedial measures in the event of pollution incidents or environmental impacts;
- Monitor and verify that environmental impacts are kept to a minimum;

- Review and approve construction methods where necessary; and
- Order the removal of any person(s) and/or equipment in contravention of the specifications of the EMPR.

3.3 The Contractor

- Be fully conversant with the EIR;
- Be fully conversant with the EMPR;
- Be fully conversant with all environmental legislation and ensure compliance (see Section 2);
- Ensure that all the environmental specifications contained within this EMPR are adhered on the site;
- Regularly liaise with the Site Manger on matters relating to the environment; and
- Confine activities to the demarcated construction site.

The above responsibilities listed for the Contractor will also apply to any appointed sub-consultants.

3.4 The Environmental Control Officer (ECO)

- Be fully conversant with the EIR;
- Be fully conversant with the EMPR;
- Be fully conversant with all environmental legislation and ensure compliance (see Section 2);
- Ensure that all the environmental specifications contained within this EMPR are adhered on the site;
- Regularly liaise with the Site Manger on matters relating to the environment; and
- Compile monthly reports as to the progress of the construction phases and report to all parties involved (Site Manager, Project Proponent).

4 ENVIRONMENTAL MANAGEMENT PROGRAMME

This section indicates the actions required to either prevent and/or minimise the potential impacts on the environmental that is associated with the construction of roads, housing and Construction Camp.

ENVIRONMENTAL ASPECT

This section highlights the various aspects associated with the project i.e. the Contractor's activities that will interact with the environment. These aspects are required according the EMPR guidelines stipulated by DEA.

ENVIRONMENTAL MEASURES AND ACTION PLAN

This section indicates the actions required to either prevent and/or minimise the potential impacts on the environmental that is associated with the construction of roads, housing and Construction Camp.

RESPONSIBILITY

This section indicates the party responsible for implementing the environmental measures and action plans laid out in the EMPR.

PRIORITY

This section indicates when the actions for that specific aspect must be implemented and/or monitored.

Table 4.1 below presents the Environmental Management Plan.

TABLE 4-1: ENVIRONMENTAL MANAGEMENT PLAN

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
4.1 Administration Requirements			
Environmental Awareness, Roles and Responsibilities for Environmental Management	<p>Appointed Contractor</p> <p>The overall responsibility for the environmental management and cost associated with the implementation of the EMPr lies with the appointed Contractor.</p>	Client/ holder of environmental authorisation	Prior to, during and after construction
	<p>The Contractor must ensure that all permanent and temporary staff, sub-contractors and suppliers adhere to the EMPr.</p>	Contractor	During Construction
	<p>The Contractor must appoint a senior staff member directly involved in the construction activities as the Environmental Site Officer (ESO).</p>	Contractor	Prior to Construction
	<p>Environmental Control Officer (ECO)</p> <p>An Independent ECO must be appointed at the developers cost to monitor the implementation of the EMPr.</p>	Client/ holder of environmental authorisation	Prior to construction
	<p>The nomination of the ECO must be given, in writing, at least fourteen days before the start of any work, clearly setting out reasons for the nomination, and with sufficient detail to enable the Developer to make a decision. The developer will, within seven days of receiving the request, approve, reject or call for more information on the nomination. Once a nominated representative of the developer has been approved he/she will be the ECO and will be the responsible person for ensuring:</p>	Client/ holder of environmental authorisation	Prior to Construction
	<p>The on site implementation of the EMPr:</p> <ul style="list-style-type: none"> • weekly monitoring of activities to ensure compliance with the EMPr; • Ensuring environmental awareness among members of the workforce; • Ensuring that the contractor/s and members of the construction workforce are aware of the requirements of the EMPr; • Implementing preventative and corrective actions in accordance with the requirements of the EMPr and outcomes of environmental audits; • Reporting of environmental incidents that may occur on site in accordance with the requirements of the EMPr and environmental legislation. 	ECO	During Construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	<p>Contractors, Sub-contractors, Suppliers and Employees</p> <p>All contractors, sub-contractors, suppliers and employees must adhere to the EMPr at all times.</p>	ECO	During Construction
	<p>Provide evidence to the ECO that the EMPr is being implemented and adhered to (either through inspections sheets or audit reports).</p>	Contractor	During Construction
Environmental Training and Induction	<p>In terms of section 2(h) and (j) of the National Environmental Management Act (No. 107 of 1998), the Contractor has the responsibility to ensure all personnel involved in the project are aware of, and familiar with, the EMPr, the key environmental issues and consequences of non-compliance to the EMPr.</p>	Contractor	Prior to and During Construction
	<p>The EMPr forms part of the formal site induction for all contractors, sub-contractors and casual labourers, preferably in their native language. The induction training will, as a minimum, include the following:</p> <ul style="list-style-type: none"> • the importance of conformance with all environmental policies; • the environmental impacts, actual or potential, of their work activities; • the environmental benefits of improved personal performance; • their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the Consultant's environmental management systems, including emergency preparedness and response requirements; and • The mitigation measures required to be implemented when carrying out their work activities. • The potential consequences of departure from specified operating procedures. 	Client	Prior to and During construction
	<p>All contractors, sub-contractors and casual labourers must acknowledge their understanding of the EMPr and environmental responsibilities by signing an induction attendance record.</p>	Client	Prior to Construction
Environmental Awareness	<p>An Environmental Awareness programme shall be implemented for all site personnel describing the key environmental issues and potential impacts thereof.</p>	ECO	During Construction
<h3>4.2 Layout and Site Establishment (Construction Camp)</h3>			
Site establishment	<p>The site selected for the Construction Camp, must ensure potential impacts on the biophysical environment are kept to a minimum.</p>	Contractor	Prior to Construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	The area to be disturbed for the developments of the Construction Camp, and access roads is to be kept to a minimum, only big enough to carry out the necessary activities.	Contractor	Prior to Construction
	Planning of development on terrain steeper than 1 vertical: 3 horizontal (>18) is not recommended.	Contractor	Prior to Construction
	Any slopes where seepage activity develops may require the provision of suitable subsoil drainage controls as integral aspects of the proposed development.	Contractor	During Construction
	The Construction Camp must be defined and fenced off and limited to authorised Contractors only. All activities must remain confined to the Construction Camp.	Contractor	Prior to Construction
	Vegetation removed for the site establishment is to be kept to a minimum. No trees are to be removed with the exception of alien weeds and invader plants.	Contractor	Prior to and running construction
	No trees or shrubs will be felled or damaged for the purpose of obtaining firewood, unless agreed to by the landowner.	Contractor	During Construction
	The construction camp is to be located a minimum horizontal distance of 200m from any watercourse, above the 1:100 year flood line and away from the wetland habitat and silted dam located on site.	Contractor	Prior to and running construction
	The Construction Camp must be kept in an orderly state at all times.	Contractor	During Construction
Fires	Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a fire-break must be cleared around the perimeter of the Construction Camp.	Contractor	During Construction
	No open fires or uncontrolled fires will be permitted on site.	Contractor	During Construction
	Fire fighting measures such as fire extinguishers must be located on site.	Contractor	During Construction
	The workforce must be made aware of fire prevention and fire fighting measures.	Contractor	During Construction
	Lighting and noise disturbance or any other form of disturbance that may have an effect on the landowner/tenant/persons lawfully living in the vicinity must be kept to a minimum.	Contractor	During Construction
Sanitation	Sufficient ablution facilities are to be constructed and linked into the existing water borne sewage system.	Contractor	Prior to Construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	In cases where facilities are linked to existing sewerage structures, all necessary regulatory requirements concerning construction and maintenance must be adhered to.	Contractor	Prior to and during Construction
	Chemical toilet facilities or other approved toilet facilities such as a septic drain must be located more than 32 metres away from the wetland buffer and must not be within the 1:100 year floodline of the river.	Contractor	Prior to and During Construction
	All effluent water from the Construction Camp washing facility must be disposed of in a properly constructed french drain, situated as far as possible, but not less than 200 m from any stream, river, pan.	Contractor	During Construction
Closure	Where a Construction Camp has been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface must be ripped and vegetated.	Contractor	After Construction
	Areas containing french drains must be compacted and covered with a final layer of topsoil to a height of 10cm above the surrounding ground surface.	Contractor	After Construction
	The site must be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.	Contractor	After Construction
	If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the contractor may require that the soil be analyzed and any deleterious effects on the soil arising from the construction be corrected and the area be seeded with a vegetation seed mix to his or her specification.	Contractor	After Construction
	Photographs of the Construction Camp, and Road sites, before and during the operation and after rehabilitation, must be taken at selected fixed points and kept on record for the information of the Construction.	Contractor	Prior to, during and after construction
4.3 Site Access			
	The site access route must be selected based on the minimum number of bushes or trees that are felled and existing fence lines should be followed as far as possible.	Contractor	Prior to Construction
	Water courses and steep gradients must be avoided as far as possible.	Contractor	Prior to and during construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	Adequate drainage and erosion protection in the form of cut-off berms or trenches must be provided around the sites and where necessary.	Contractor	Prior to and during construction
	Newly constructed access roads must be adequately maintained so as to minimise dust, erosion or undue surface damage.	Contractor	Prior to and during construction
	The liberation of dust into the surrounding environment must be effectively controlled by the use of water spraying and/or other dust-allaying agents. The speed of haul trucks and other vehicles must be strictly controlled to avoid dangerous conditions, excessive dust or excessive deterioration of the road being used.	Contractor	During Construction
	Roads must be ripped or ploughed, and if necessary, appropriately fertilised (based on soil analyses) to ensure the re-growth of vegetation. Imported road construction materials, which may hamper re-growth of vegetation must be removed and disposed of in an approved manner prior to rehabilitation.	Contractor	After Construction
<h3>4.4 Vehicle Maintenance Yard and Secured Storage Areas</h3>			
	The vehicle maintenance yard and secured storage area will be above the 1 in 5 year flood level mark within the boundaries of the Construction Camp.	Contractor	Prior to Construction
	The area chosen for these purposes must be the minimum required and involve the least disturbance to trees and plant life. Topsoil must be handled as described in section 4.7 below.	Contractor	During Construction
	The storage area must be securely fenced and all hazardous substances such as fuel, oils, chemicals, etc., must be stored therein. Drip trays, a thin concrete slab or a facility with PVC lining, must be installed in such storage areas with a view to prevent soil and water pollution.	Contractor	Prior to and During Construction
	The location of both the vehicle maintenance yard and the storage areas are to be indicated on the layout plan determined by the Contractor.	Contractor	Prior to Construction
	No vehicle may be extensively repaired in any place other than in the maintenance yard.	Contractor	During Construction
	The maintenance of vehicles and equipment used for any purpose during the operation will take place only in the maintenance yard area within the construction camp.	Contractor	During Construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	Equipment used for excavations at the upgrading of the roads and structures must be adequately maintained so that during operations there is no spillage of oil, diesel, fuel, or hydraulic fluid.	Contractor	During Construction
	Machinery or equipment used on site must not constitute a pollution hazard in respect of the above substances. The Constructor must order such equipment to be repaired or withdrawn from use if they consider the equipment or machinery to be polluting and irreparable.	Contractor	During Construction
	Covered receptacles must be available at all times and conveniently placed for the disposal of waste. All used oils, grease or hydraulic fluids must be placed therein and these receptacles will be removed from the site on a regular basis for disposal at a registered or licensed disposal facility.	Contractor	During Construction
	All spills should be cleaned up immediately to the satisfaction of the ECO by removing the spillage together with the polluted soil and by disposing of them at a recognised Hazardous Waste facility.	Contractor	During Construction
	On completion of all operations, the areas must be cleared of any contaminated soil, which must be handled as referred to in section 4.7 below.	Contractor	After Construction
	All buildings, structures or objects in the vehicle maintenance yard and secured storage areas must be dealt with removed according to the relevant legislated procedures.	Contractor	After Construction
	The construction camp area and access road surfaces must then be ripped or ploughed to a depth of at least 300mm and the topsoil previously stored adjacent the site, must be spread evenly to its original depth over the whole area. The area must then be fertilised if necessary (based on a soil analysis) and re-vegetated.	Contractor	After construction
<h3>4.5 Pollution Control Measures</h3>			
	Material Safety Data Sheets (MSDS) for on site chemicals, hydrocarbon materials and / or waste and hazardous substances must be readily available. MSDS's should include information pertaining to environmental impacts and measures to minimise and mitigate against any potential environmental impacts which may result from a spill.	Contractor	During Construction
	The Contractor should prepare a method statement and plans for the storage of hazardous substances and emergency procedure.	Contractor	Prior to and During Construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	Storage of hazardous substances must not be within 100m of any watercourses, wetland areas and drainage lines;	Contractor	During Construction
	Static tanks containing fuel, oil, grease or bituminous material should be confined to specific secure areas under lock and key	Contractor	During Construction
	These containment facilities should be checked and maintained at all times.	Contractor	During Construction
	Provide proper warning signage to make people aware of the activities within the designated areas.	Contractor	During Construction
	In the event of rain, water collected within these containment facilities must not be released if not contaminated. If the contents of containment facilities are contaminated the material must be removed and disposed of as hazardous waste.	Contractor	During Construction
	In the case of a spill of hydrocarbons, chemicals or bituminous material in the Construction camp or on the construction site, the spill should to be contained and the material together with any contaminated soil collected and disposed of as hazardous waste.	Contractor	During Construction
	<p>Should a pollution incident occur on site the ECO must:</p> <ul style="list-style-type: none"> • Implement reasonable measures immediately to contain and minimise the impacts of the incident; <ul style="list-style-type: none"> ❖ Identify, if possible, the spilt material. ❖ Stop the spill, but only if it is safe to do so, i.e. turn off the tap, stand the container up, etc. ❖ Attempt to block the spill from entering any watercourses ❖ Immediately notify the nominated member of staff that deals with spills. • Notify all persons whose health may be affected by the incident; • Undertake clean up procedures immediately; • Notify the Contractor of the incident immediately who will advise the employee as to the measures that should be implemented; • Record the incident in the Environmental Incident Register; and • Implement measures to prevent similar incidents from occurring in the future. 	Contractor	During Construction
	Spills should be cleaned up immediately to the satisfaction of the ECO by removing the spillage together with the polluted soil and by disposing of it at a recognised facility.	Contractor	During Construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	Soil and construction material stockpiles are to be bermed to prevent leachate and polluted run-off water from leaving the Construction Camp.	Contractor	During Construction
	Concrete mixing must be confined to as few areas as possible and ad hoc mixing is to be avoided. Areas where concrete was mixed must be cleaned up after use. Concrete mixing is to be undertaken on an impervious surface and any run-off contained.	Contractor	During Construction
	A security officer should be on duty at the Construction Camp after hours and over weekends, in order to prevent unauthorized people from entering and tampering with equipment and materials.	Contractor	During Construction
Pump Station	Contingency measures must be put in place to ensure efficiency in the functioning of the pump, these include: <ul style="list-style-type: none"> • The installation of a back-up generator; • Measures must be implemented to ensure quick detection and repair of leakages and breakages; that is, regular maintenance to be done. 	Contractor	During Construction
4.6 Solid Waste Management			
General Waste	General waste produced on site includes: <ul style="list-style-type: none"> • Office waste (e.g. food, waste, paper, plastic); • Operational waste (clean steel, wood, glass); and • General domestic waste (food, cardboards, paper, bottles, tins). 	Contractor	During Construction
	An adequate number of general waste receptacles must be arranged around the Construction Camp, on site to collect all domestic refuse, and to minimise littering.	Contractor	During Construction
	Bins should be clearly marked and lined for efficient control and safe disposal of waste.	Contractor	During Construction
	Different waste bins, for different waste streams must be provided to ensure correct waste separation.	Contractor	During Construction
	General waste produced on site is to be collected in skips for disposal at the local municipal waste site. Hazardous waste is not to be mixed or combined with general waste earmarked for disposal at the municipal landfill site.	Contractor	During Construction
	No general waste is to be disposed of at the spoil area.	Contractor	During Construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	Under no circumstances is waste to be burnt or buried on site.	Contractor	During Construction
	Waste bins should be cleaned out on a regular basis to prevent any windblown waste and/or visual disturbance.	Contractor	During Construction
	All general waste must be removed from the construction areas on a daily basis and disposed of in suitable waste receptacles at the Construction Camp.	Contractor	During Construction
	Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container at a collecting point and collected on a weekly basis and disposed of at a recognised disposal facility. Specific precautions must be taken to prevent refuse from being dumped on or in the vicinity of the site.	Contractor	During Construction
	Biodegradable refuse generated from the construction camp and storage area or any other area must either be handled as indicated above or be buried in a pit excavated for that purpose and covered with layers of soil, incorporating a final 0.5 metres thick layer of topsoil (where practicable). Provision should be made for future subsidence of the covering. Local authorisation must be obtained before any refuse is allowed to be buried. Another option is sending this waste to the local municipal waste site.	Contractor	During construction
Hazardous waste	Hazardous waste produced on site includes: <ul style="list-style-type: none"> • Oil and other lubricants, diesel, paints, solvent; • Containers that contained chemicals, oils or greases; and • Equipment, steel, other material (rags), soils, gravel and water contaminated by hazardous substances (oil, fuel, grease, chemicals or bitumen). 	Contractor	During Construction
	Hazardous waste is to be disposed at a Permitted Hazardous Waste Landfill Site. The ECO must identify an approved waste disposal site at the inception of the project.	Contractor	During Construction
	Hazardous waste bins must be clearly marked, stored in a contained area (or have a drip tray) and covered (either stored under a roof or the top of the container must be covered with a lid).	Contractor	During Construction
	A hazardous waste disposal certificate must be obtained from the waste removal company as evidence of correct disposal.	Contractor	During Construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	It may be feasible for the waste to be transported to a central point where it can be collected in bulk by the waste disposal company. It should however be noted that: <ul style="list-style-type: none"> • Transport of hazardous materials must be done in accordance with legislative control; and • Relevant SABS Codes of Practice should be adhered to. 	Contractor	During Construction
Industrial waste	The industrial waste must be stored in skips and taken to a hazardous landfill site. Safe disposal certificates must be provided for this.	Contractor	During construction
Wastewater	All waste water generated at the proposed development must be disposed off in a responsible manner so as not to cause any surface or sub surface water pollution or health hazard. Waste water including cement-contaminated water must not enter any water course and shall be managed by the site manager to ensure that the existing water resources on and of site are not polluted by activities emanating from the above development.	Contractor	Prior and during construction
	Contaminated wastewater including cement-contaminated water shall not enter any watercourse and shall be managed by the site manager to ensure that the existing water resources on and of site are not polluted by activities emanating from the above development.	Contractor	Prior and during construction
4.7 Spoil and Topsoil and Erosion			
Topsoil	Topsoil removed from roadsides and Construction Camps must be stockpiled in a designated area. This area must be established in accordance with pollution control measures set out in this EMPR.	Contractor	During Construction
	The removed topsoil must be stored in a bund wall on the high ground side of the construction camp area outside the 1:100 year flood level.	Contractor	During Construction
	Topsoil must be kept separate from overburden and must not be used for building or maintenance of access roads	Contractor	During Construction
	The developer must exercise suitable precautions with the storage, handling and transport of all materials that could adversely affect the environment. Such precautions include avoiding spills and littering. If pollution of any surface or groundwater occurs, it shall immediately be reported to this Department and appropriate mitigation measures must be employed.	Contractor	During Construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
Spoil	Spoil site should not be located within the 1:100 year flood line.	Contractor	During construction
	Litter and general waste is to be removed from the soil and spoiling before stockpiling.	Contractor	During construction
	Spoil sites will be shaped to fit the natural topography.	Contractor	After construction
	Spoil sites must receive a minimum of 75mm topsoil and be grassed with the recommended seed mixture.	Contractor	After construction
	Slopes must not exceed a vertical: horizontal ratio of 1:3.	Contractor	After construction
Soil Erosion	<p>Soil erosion on site must be prevented at all times, i.e. pre, during and post construction activities. Suitable erosion control measures must be implemented in areas sensitive to erosion such as near water supply points and edges of slopes. These measures could include:</p> <ul style="list-style-type: none"> • The use of sand bags or Hessian sheets. • The prompt rehabilitation of exposed soil areas with indigenous vegetation to ensure that soil is protected from the elements. • The removal of vegetation, only as it becomes necessary for work to proceed. • Preventing the removal of vegetation especially on steep areas until the area will be used. Taking necessary precautions in terms of design and construction and earthworks, cuts and fills must be taken. <p>Constant cognisance of the inherent high erosion risk potential of all soils and sites on the property should be taken and appropriate control and preventative measure put in place.</p>	Contractor	Prior to, during and after construction
	The stockpiling of soil or any other materials shall not be allowed near a watercourse or water body to prevent pollution or impediment to surface runoff. The developer must control and establish suitable mitigation measures to prevent the erosion of the stockpiles.	Contractor	Prior to, during and after construction
4.8 Water Management			
Surface water	The flow direction of any surface water run-off must be established prior to disturbing any area.	Contractor	Prior to and During Construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	Buffer zones should be maintained between the hard standing and the water course to allow for reduction in flow velocities there minimising the risk of erosion from the site.	Contractor	During Construction
	A good vegetation cover along the length of the water courses must be established and maintained to reduce the likelihood of scour of the channel that would lead to erosion.	Contractor	During Construction
	Contaminated wastewater including cement contaminated water must not enter any watercourse and must be managed by the site manger to ensure that the existing water resources on and off site are not polluted by the development;	Contractor	During Construction
	The stockpiling of soil or any other material must not be allowed near a watercourse or water body in order to prevent pollution or impede surface runoff;	Contractor	During Construction
	Attenuation and retention facilities (e.g. paddocks/attenuation ponds) need to be designed and implemented to regulate runoff in terms of retention, attenuation and percolation thus ensuring that post flow conditions closely reflect the pre-development hydrological conditions. These facilities should be sized and placed in such a manner so as not to impact general runoff conditions. The design of these facilities needs to be based on the outcomes as set out in the hydrological assessment.	Contractor	During Construction
	The contractor must submit to the client his plan for prevention, containment and rehabilitation measures against environmental damage of the identified water and drainage systems in and around all the sites.	Contractor	During and after construction
	Berms are to be constructed to divert clean water around any dirty area i.e. the construction camp and on the construction site.	Contractor	During Construction
	Dirty water originating from the construction camp and on the construction site is to be contained and disposed of correctly, to prevent the contamination of soil and/or any watercourses.	Contractor	During Construction
	The construction camp must have adequate drainage and the development of areas of standing water must be prevented.	Contractor	During Construction
	Washing of vehicles, equipment, machinery or materials is prohibited at the construction camp or on the construction site, unless done in a contained area that has a suitable impervious floor and is designed for this purpose.	Contractor	During Construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	Bathing or washing of clothes, equipment or machinery within any watercourse is prohibited.	Contractor	During Construction
	Erosion and loss of soil must be prevented by minimising the construction areas exposed to surface water run-off.	Contractor	During Construction
	Bare areas are to be rehabilitated as soon as the areas become available or after use.	Contractor	During Construction
Storm water Management	<p>A storm water management plan/system needs to be drawn up and implemented to ensure proper management of storm water on the site during and after construction to ensure that pollutants and sediment are not released into the river and the estuary and must comply with the following:</p> <ul style="list-style-type: none"> • “Clean” and “dirty” areas must be separated and suitable stormwater measures must implemented to ensure that the first flush from the dirty areas are effectively managed so as not to cause any water pollution. • The stormwater drainage network system must be kept separate from the sewage effluent system. • Drainage must be controlled to ensure that runoff from the site will not culminate in off-site pollution, cause water damage to properties further down from the site or silting of any water resource. • The water containing waste emanating from within the dwellings or any other building on the property should not contaminate the storm water system. • The Stormwater Management Plan should ensure that the ultimate flow from the development does not result in any negative impacts on downstream properties or water resource and must therefore ensure that stormwater is managed within the overall site as effectively as possible. 	Contractor	Prior to and during construction
	The potential increase in catchment runoff must be balanced against the combined effects of evapo-transpiration from catchment vegetation, evaporation from water bodies plus the retention and re-use of both storm runoff and treated wastewater.	Contractor	During and after construction
	The potential increase in flood peaks must be mitigated to at least predevelopment levels by the provision of sufficient stormwater detention facilities at micro and macro levels.	Contractor	During and after construction
	The potential increase in flood volumes must be mitigated where possible by subsoil infiltration, retention of runoff in on-site facilities for irrigation use and unsaturated wetland areas where evaporation and infiltration can help to reduce flood runoff rates.	Contractor	During and after construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	Installations must be provided to contain pollution as close to source as possible and in a practical location for servicing by Department of Solid Waste.	Contractor	During and after construction
4.9 Wetland Management			
	A 20 meter buffer must be maintained from the edge of the temporary wetland with a further 10 meter limited use buffer.	Contractor	Prior to and during construction
	Clearing activities must only be undertaken during agreed working times and permitted weather conditions. If heavy rains are expected, clearing activities should be put on hold. In this regard, the contractor must be aware of weather forecasts.	Contractor	Prior to and during construction
	A combination of sandbags and silt fences must be established along the edge of all bare and exposed platform surfaces above the wetlands and un-kerbed roads.	Contractor	Prior to and during construction
	The berms and silt fences must be monitored for the duration of the construction phase and repaired immediately should damage occur. The berms and silt fences must only be removed once vegetation cover has successfully re-colonised the embankments.	Contractor	Prior to and during construction
	Once shaped, all exposed surfaces and fill embankments must be vegetated immediately.	Contractor	Prior to and during construction
	The bare surfaces must be hydroseeded. In the winter months, the grassing must be watered daily until re-colonisation is successful. During the wet months, the grassed surfaces must be monitored for erosion until re-colonisation is successful.	Contractor	Prior to and during construction
	Effort must be made to ensure that the stormwater system, including pipes, drains, headwalls and Reno-mattresses are not silted up during the construction phase. Siltation will be minimised by ensuring that the roads and paths remain clear of sediment. In this regard, road surfaces adjacent to bare soil surfaces must be protected by a combination of silt fences and sandbags.	Contractor	Prior to and during construction
	After every rainfall event, the contractor and ECO must check the site for erosion damage and rehabilitate this damage immediately. Erosion rills and gullies must be filled in with engineered stabilised fill.	Contractor and ECO	Prior to and during construction
	It is important that these mitigation measures are costed for in the construction phase financial planning and budget so that the contractor and/or developer cannot give financial budget constraints as reasons for non-compliance.	Contractor and Developer	Prior to and during construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	All storm water runoff must be actively attenuated on site prior to any discharge into natural systems.	Developer	During construction
Road Crossings	All roads crossing wetland systems must have a layer of large diameter dump-rock or crusher-run and their base substrate to allow unimpeded, diffuse flow of ground and surface water under the road.	Contractor	Prior to and during construction
	Access roads must be designed in consultation with the wetland specialist.	Contractor	Prior to construction
	Pipes or culverts under the road must not concentrate flow but should aim to allow even movement of water under the road bed across the entire wetland.	Contractor	Prior to and during construction
	No machinery may cross a wetland as a short-cut between two points. Any contractor who does so must be liable for a fine as a non compliance offence.	Contractor	during construction
Storm water	Storm water discharge points should be developed on the principle of many smaller points rather than fewer larger points.	Developer	Prior to construction
	All discharge points must have suitable scour protection in the form of Reno mattresses or similar energy dissipation structures.	Developer	Prior to construction
	Attenuation structures must be located outside the wetland and 20m buffer, the opportunity exists to use the outer 10m of a 30m buffer for the placement of attenuation structures.	Developer	Prior to construction
	An adequately sized and keyed-in stilling basins and Reno-mattress must be established below all discharge points to prevent erosion. The outer edge of the headwall and Reno-mattress structure must be demarcated with snow fencing and approved by the Environmental Control Officer prior to construction commencing. All wetland areas beyond this demarcation must be considered no-go zones during the construction phase. The snow fencing must be kept taught at all times	Contractor	Prior to and during construction
Pipeline Infrastructure	All sewer and water pipelines must be located outside of the wetland and buffer.	Contractor	Prior to construction
	Any crossings must be planned at narrow points in the systems and must be perpendicular to the direction of flow.	Contractor	Prior to and during construction
	The possibility of pipe-bridges or pipe-jacking should be considered for crossings.	Contractor	during construction
	Both services (water and sewer) should cross within a 'disturbance corridor' rather than having crossings at multiple points in the wetland. Existing areas of disturbance such as road crossings should be considered for reticulation.	Contractor	Prior to and during construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
4.10 Wetland Rehabilitation			
Rehabilitation Plan	The loss of this system can be offset via either and on-site or off-site rehabilitation programme. A policy of no net loss of wetland area should be adopted and a suitably sized system identified and enhanced to a level where the relative pristine area lost is replaced and functionality improved.	Contractor and Developer	After construction
	Another alternative is the inclusion of the wetland within the planned ERF as conservation servitude. This will allow the achievement of the desired bulk area, but will also maintain this system.	Contractor and Developer	After construction
	Spreader canals need to be included in the design to promote lateral dispersion of flow and spread the flow across the wetland more effectively.	Contractor	After construction
	Vehicle and pedestrian tracks to work site within the wetland must be lightly ripped following completion to break up compacted soil and replanted with suitable indigenous plant species.	Contractor	After construction
	Pedestrian and vehicle access to the wetland and buffer must be prohibited. Site security staff should be aware of these requirements and if people are seen accessing the site they should be directed to leave immediately.	Contractor	After construction
	The feasibility of fencing the wetland and buffer within the site should be considered as an option, however, the same rules regarding access must then apply to staff employed on the site.	Contractor	After construction
	Areas of illegal dumping and soil stockpiles must be removed from the wetlands and these areas must be rehabilitated and re-planted as per the specifications given below.	Contractor and Developer	After construction
	<p><i>Wetland 1:</i></p> <p>It is proposed that two gabion weir structures be installed within this portion of the wetland. The lower structure must be placed just upstream of a portion of backflooded wetland linked with the stream floodplain. The weir must be positioned at a point where the channel merges with the system. The second weir is positioned higher up the system at a point where the slope on the system between the lower weir and upper weir is between 1%-2%. The upper must be positioned such that the predicted backflooding will not influence the R102. Each weir should have a Reno Mattress base plinth and stilling-basin. The weir should not be higher than two metres.</p> <p><i>Refer to Appendix A of the EMP.</i></p>	Contractor	After construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	<p><i>Wetland 2:</i> It is proposed that three gabion weirs be installed within this portion of the wetland. The lower structure must be placed just upstream of the R102 and will flood back to the second weir at a 1%-2% grade. The second weir in turn will flood back to the third weir. The third weir will make use of an existing farm road crossing and culvert. These final structures will backflood to the property boundary, where the system enters the site. As above, the weirs must be built on a Reno Mattress with stilling basin and should not be higher than two metres. <i>Refer to Appendix B of the EMP.</i></p>	Contractor	After construction
	<p><i>Wetland 3:</i> Planning within this system identified the need for four gabion structures located down the length of the system. The first structure is to be located at a point where backflooding will stop just below the R102 – where the system enters this part of the site. Two further structures are then located at intervals down the central drain. Each set at a distance to allow for an approximate 1%-2% gradient on the wetland. The final structure is located on the property boundary – on the western edge of the site. This structure is positioned to maximise the ecosystem services from the rehabilitation efforts prior to the water leaving the property. <i>Refer to Appendix C of the EMP.</i></p>	Contractor	After construction
Re-Vegetation	Active planting of the sedge <i>Cyperus latifolius</i> / <i>Cyperus dives</i> should take place in the permanently inundated section of the wetland.	Contractor	After construction
	In addition the growth of species such as <i>Leersia hexandra</i> , <i>Cyperus prolifer</i> , <i>Cyperus sphaerospermus</i> , <i>Mariscus solidus</i> , <i>Imperata cylindrica</i> , <i>Ischaemum fasciculatum</i> and <i>Ludwigia octovalvis</i> should be encouraged (but not limited to) within the wetland areas.	Contractor	After construction
	The Removal and subsequent management of these alien invasive plant species is very important in maintaining the biodiversity value and integrity of the wetland.	Contractor	After construction
	<p>Three basic methods of controlling alien plant species exist:</p> <ul style="list-style-type: none"> • mechanical control (hand pulling, slashing and felling); • biological control (introduction of natural predators into a system to control the plants); and • chemical control (spraying and painting of poisons onto the plant to kill them) 	Contractor	After construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	<p>Limited planting of locally occurring species such as <i>Phragmites australis</i>, <i>Cyperus latifolius</i>/ <i>Cyperus dives</i>, <i>Cyperus prolifer</i>, <i>Cyperus textilis</i> and <i>Cyperus sphaerospermus</i> could occur in areas of significant disturbance, especially areas exposed once alien plants are removed. Much of the material required can be selectively harvested from the site itself. Tubers and rhizomes of wetland species should be collected and replanted where required. In addition the growth of species such as <i>Leersia hexandra</i>, <i>Imperata cylindrica</i>, <i>Ischaemum fasciculatum</i>, <i>Dissotis canescens</i> and <i>Ludwigia octovalvis</i> should be encouraged (but not limited to) within the wetland areas</p>	Contractor	After construction
	<p>Species identified within the wetland and buffer includes <i>Arundo donax</i>, <i>Melia azedarach</i>, <i>Litsea glutinosa</i>, <i>Solanum mauritianum</i>, <i>Ricinus communis</i>, <i>Lantana camara</i> and <i>Chromolaena odorata</i>. Removal and subsequent management of these species is very important in maintaining the biodiversity value and integrity of the wetland.</p>	Contractor	After construction
	<p>During the initial clearing phase, smaller individual alien plants (and saplings) should be pulled out by hand and removed from the site. Larger plants should be ring barked, cut or slashed to just above the soil surface and the exposed cambium or stumps carefully painted with a suitable poison.</p>	Contractor	After construction
	<p>Follow-up clearing should take place every two weeks for the first 3 months. The clearing activities can then be reduced to once a month after this period. It is important to note that the effective control of alien plants on the site will be an ongoing process. Provided the initial clearing process is carried out effectively, subsequent management should remain fairly minor. However these plant species are highly opportunistic and any lapse in control will see the site rapidly re-infested with these weeds.</p>	Developer and Contractor	After construction
Discharge Points	<p>Some runoff, from the road access and site edges may end up in the wetland. These release points must:</p> <ul style="list-style-type: none"> • Be located outside of the wetland boundary and buffer (outer 10m services servitude); • Have suitable scour protection (gabion or reno mattress) to dissipate water energy and prevent erosion; • Should be spread along the system to prevent point-source release of runoff; and • Should be monitored regularly (particularly after large rain events) to ensure no scour has occurred. 	Contractor	After construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	The quality of runoff must be closely monitored to ensure no pollution is entering the wetland or stormwater drainage system as a whole.	Contractor	After construction
Monitoring	<p>The following steps must be taken to ensure compliance:</p> <ul style="list-style-type: none"> • Surfacewater monitoring will take place at both stormwater discharge points, as well as within the wetland; • Groundwater monitoring must take place from two boreholes to be sunk immediately upstream and downstream of the site to ensure no contaminants are leaching off the property; • Sampling should take place biannually during summer and winter months. • A suitably qualified collection and testing company should be appointed to ensure compliance and quality of data. 	Contractor and Developer	After construction
	<p>In order to determine the progress and ultimate success of the rehabilitation project monitoring of the site will be required to assess the restoration of the system. Factors to be assessed as part of the monitoring should include;</p> <ul style="list-style-type: none"> • Scaled or ranked measurements (e.g. level of wetness: temporary, seasonal or permanent wetness); • Accurate measurement (e.g. distance in meters advanced by a headcut erosion site); • Classification (e.g. plant species composition and community distribution); and • Qualitative Assessment: descriptions, observations, perceptions, insights and attitudes. 	Developer	After construction
	Monitoring must take place during the initial construction stages of the rehabilitation project as well as operational / recovery phase.	Developer and ECO	After construction
	While the earth plugs are being installed and the alien plants removed, monitoring should be more regular to identified issues quickly and have them remedied. Once excavation and construction activities are complete in the wetland, and these areas have been ripped and replanted, then assessments can become less frequent as distinct changes will take longer to manifest.	Developer	After construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
4.11 Air Quality			
	Stockpiles may become sources of wind generated dust. These must be covered during windy periods or watered.	Contractor	During construction
	Areas under construction may become sources of wind generated dust and dust suppression techniques must be implemented when necessary.	Contractor	Prior to and during construction
	Dust entrained from vehicular movement must be minimised by road wetting and by implementing speed limits.	Contractor	During Construction
	Construction materials being transported on site should be covered in order to minimise dust entrainment.	Contractor	During Construction
	No burning of waste, such as plastic bags, cement bags and litter, is permitted on site.	Contractor	During Construction
	A complaints register must be maintained on site to report any excessive dust incidents.	Contractor	During construction
4.12 Noise			
	Construction activities should be undertaken according to during daylight working hours between the hours of 07:00 – 17:00 on weekdays and 07:30 – 13:00 on Saturdays and Sundays	Contractor	During construction
	Construction vehicles and equipment generating excessive noise should be fitted with noise abatement measures.	Contractor	During Construction
	Construction workers must be provided with the appropriate PPE i.e. ear plugs	Contractor	During Construction
	A complaints register should be provided to report any excessive noise.	Contractor	During Construction
4.13 Protection of Fauna and Flora			
	The extent of the area disturbed should be kept to the minimum required to successfully implement the road upgrading activities, thus minimising the destruction of any fauna and flora.	Contractor	Prior to and during construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	The use of on site dissipation of storm water may be accommodated within the site with maintenance of general hydrology associated with site.	Contractor	During construction
	A significant buffer zone must be established around the entire lower hygrophilous forest system approximating 45m in width.	Contractor	During construction
	All wetlands must be allocated a 20m buffer with a further 20m limited use buffer.	Contractor	Prior to and during construction
	A specialist ecologist will be on site during the construction period to ensure that sensitive areas are not encroached on.	Contractor	During construction
	Mowing of grass should be restricted to the road reserve.	Contractor	Prior to, during and after construction
	No natural vegetation is to be collected for use as firewood.	Contractor	During construction
	No animals are to be disturbed unnecessarily and no animals are allowed to be shot, trapped or caught for any reason.	Contractor	During construction
	Protected trees may not be removed or cut without a permit from the Department of Forestry and Fisheries (DAFF).	Contractor	During construction
	Invader species and weeds must be removed and disposed of in accordance with existing legislation on a regular basis.	Contractor	Prior to and during construction
	The removal of indigenous/endemic shrubs and small trees should be kept to a minimum and only be removed if absolutely necessary.	Contractor	During construction
	A 30m buffer must be afforded along the forest fringe.	Contractor	During construction
	Fires for cooking must be kept within designated areas at the construction camp. All fires are to be contained.	Contractor	During construction
	Workers are to be provided with firewood for cooking and are not permitted to cut down any vegetation for this purpose.	Contractor	During construction
4.14 Excavations			
Archaeological Sites	If an artefact on site is uncovered, work in the immediate vicinity must be stopped immediately.	Contractor	During construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	The contractor must ensure that no person removes or damages any such article and must immediately, upon discovery thereof, inform the Construction Engineer of such discovery.	Contractor/ Engineer	During Construction
	The National Monuments Council is to be contacted who will appoint an archaeological consultant.	Contractor	During Construction
	Work may only resume once clearance is given in writing by the archaeologist.	Contractor	During Construction
4.15 Public Safety			
	Members of the public adjacent to the construction area, road area and Borrow Pits should be notified of construction activities in order to limit unnecessary disturbance or interference	Contractor	During construction
	Dedicated pathways for pedestrians should be developed to ensure safe passage around construction activities.	Contractor	During construction
	Construction activities should be undertaken according to during daylight working hours between the hours of 07:00 – 17:00 on weekdays and 07:30 – 13:00 on Saturdays and Sundays	Contractor	During construction
	A safety officer is to be appointed who will continuously monitor safety conditions during construction activities.	Contractor	During construction
	Flag men should be appointed and provide ample warning of road hazards.	Contractor	During construction
	Construction vehicles must avoid public roads during peak hours.	Contractor	During construction
	The dangers associated with entry and exit points for the construction camp should be given special consideration.	Contractor	During construction
	The construction camp should be sited so as to minimise the potential hazard to motorists travelling on the main roads. The dangers associated with entry and exit points should be given special consideration.	Contractor	Prior to and during construction
	All members of the construction workforce working on the site or near the roads are to be provided with the appropriate high visibility clothing to ensure that they are seen by motorists.	Contractor	During construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	All construction workers handling chemical or hazardous substances must be trained in the use of such substances and the environmental, health and safety consequences of incidents.	Contractor	Prior to and during construction
	The workforce is to be provided with sufficient potable water and under no circumstances are they to use untreated water from local watercourses for drinking.	Contractor	During construction
Traffic and Transport	Slow-moving construction vehicles should, where possible, avoid being on the main roads during rush hour (i.e. roughly 06:00 – 09:00 and 16:00 – 18:00) in order not to contribute to traffic congestion.	Contractor	During Construction
	Travelling of these vehicles to and from the site should either be done at times when the volume of traffic is less concentrated or lesser-used back roads should be used to reach the site.	Contractor	During Construction
	Potential damage by construction vehicles to the access roads will need to be addressed accordingly. Any damage caused must be appropriately rehabilitated (i.e. to a state comparable with the roads initial condition). Liaison must take place with the local roads agency or authority in this regard.	Contractor	During Construction
	Controls should be imposed on construction traffic to ensure minimal disturbance to neighbours and fellow road users	Contractor	During Construction
4.16 Complaints and Environmental Incident Register			
	Complaints received from the community and other I&AP's must be registered and recorded by the ECO and also brought to the attention of the Contractor. Both parties will respond accordingly. The following information must be recorded in the case of any complaint/incident: <ul style="list-style-type: none"> • Time, date and nature of complaint; • Response and investigation undertaken; and • Actions taken and by whom. 	Contractor	During construction
	All complaints will be investigated and a response is to be given to the complaint within 7 days of receipt.	Contractor	During construction
4.17 Social Impacts			

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	Construction vehicles and equipment must have appropriate noise abatement measures.	Contractor	During construction
	Tender documents should include statements to include the use of local communities or local community organisation in supplying services and labour to the construction activities.	Contractor	Prior to construction
	Contractors should use labour intensive construction methods where possible. Local labourers should be used for such methods.	Contractor	During construction
	<p>Due to the concentration of a workforce in the area over the construction period, the contractor shall implement an HIV/AIDS Awareness Programme on site. The contractor shall appoint an HIV/AIDS Awareness Officer for the duration of the construction period. Activities for HIV/AIDS awareness and prevention will be broad based, targeting both individuals and groups. They may consist of:</p> <ul style="list-style-type: none"> • Information posters in public places both on and off site (eating places, bars, guest houses, etc); • Peer educators (reference people) drawn from the local labour force and trained in HIV/AIDS issues for discussions with colleagues (estimate 1 per 30 employees); • Small focus group discussions and information covering key issues should be held; • Inclusion of HIV/AIDS activities at site meetings and other discussions; and • Voluntary Counselling and Testing (VCT). • <p>Education will cover:</p> <ul style="list-style-type: none"> • Stigma and discrimination issues; • Preventative behaviours including partner reduction, condom use, and awareness and importance of treatment of STDs; • Skills including negotiating safer sex, correct condom use, purchase without embarrassment; • Referral to local health centres and services available. 	Contractor	During construction
<h3>4.18 Monitoring, Reporting and Record Keeping</h3>			
Environmental Monitoring	Environmental monitoring will be undertaken by the ECO on a monthly basis, or at a frequency deemed appropriate by the KZN DAEA.	ECO	During construction

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	This monitoring will be undertaken in order to ensure compliance with all aspects or requirements of the EMPr.	ECO	During construction
	The results of the monthly assessments will be made available to DAEA upon request.	ECO	During construction
	The ECO is to inspect and monitor on and off-site operations and to implement the necessary actions to ensure compliance with the EMPr.	ECO	During construction
	An Environmental Consultant is to undertake external audits of the EMPr on a 6 monthly basis. This will involve the completion of the monthly environmental checklists.	Contractor / Environmental Consultant	During construction
	The ECO should report and discuss any difficulties with the implementation of the EMPr with the Environmental Consultant.	ECO	During construction
	The ECO and Environmental Consultant should review and modify the EMPr on an annual basis or as required.	ECO	During construction
Visual Monitoring – DWA Requirement	Visual monitoring must be carried out on a monthly basis to ensure that the development activities create no impacts on the river, wetlands and/or estuary.	Applicant / ECO	Prior to and during construction
Complaints register and environmental incident book	Complaints received from the community and other I&AP's must be registered and recorded by the ECO and also brought to the attention of the contractor. Both parties will respond accordingly. The following information must be recorded in the case of any complaint/incident: <ul style="list-style-type: none"> • Time, date and nature of complaint; • Response and investigation undertaken; and • Corrective and preventative actions taken and by whom. 	ECO	During construction
	All complaints received will be investigated and a response is to be given to the complainant within 7 days.	ECO	During construction
	All environmental incidents occurring on the site will need to be recorded in an Environmental Incident Book. The following information must be provided: <ul style="list-style-type: none"> • Time, date and nature of complaint; • Response and investigation undertaken; and • Corrective and preventative actions taken and by whom. 	ECO	During construction

4.19 Emergency Procedures

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	To avoid the occurrence of any incidents, the contractor will ensure that the entire workforce that will be responsible for the operation are trained on the operation of the facility.	Contractor	Prior to and during construction
	The ECO will ensure that all the emergency procedures relevant to the above mentioned incidents are developed and the workforce is trained on these procedures to ensure that correct actions are followed during emergency situations.	ECO	During construction
	The list of the emergency telephone numbers will be maintained on site.	ECO	During construction
4.20 Rehabilitation			
	The applicant is responsible for compliance with the provisions for Duty of Care and Remediation of Damage in accordance with Section 28 of National Environmental Management Act (NEMA), Act No. 107 of 1998.	Applicant/ Contractor	During and After construction
	All remaining construction infrastructure, building rubble and waste are to be removed from the site.	Contractor	After construction
	All disturbed surfaces compacted by construction and operation activities including the ablutions and loading areas should be ripped to a minimum depth of 30cm to allow organic contaminants to breakdown and promote vegetation establishment.	Contractor	After construction
	The construction camp site should be landscaped to ensure efficient drainage of the site. Water should not be allowed to pond on the site.	Contractor	After construction
	The area designated for the deposition of spoil material is to be levelled and shaped to ensure efficient drainage of the site. Water should not be allowed to pond on site. Under no circumstances is general or hazardous waste to be disposed of at this site.	Contractor	After construction
	Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from construction camp and disposed of at a recognised landfill facility.	Contractor	After construction
	Final rehabilitation must be completed within a period specified by the Engineer.	Contractor	After construction
4.21 Monitoring and Maintenance			

ENVIRONMENTAL ASPECTS	ENVIRONMENTAL MEASURES AND ACTION PLANS	AREA APPLICABLE	PRIORITY
	<p>The conditions of the development must be monitored for a period of one year after the development is complete to ensure that:</p> <ul style="list-style-type: none"> • Erosion is not taking place; • The stormwater run-off measures are working; • An Environmental Complaints Register should be kept detailing complaints received, date, response and action taken; • Any maintenance where intrusive works are necessary should adhere to the mitigation measures put in place in the EMPR; and • Where such measures are impractical due to the nature, duration and extent of maintenance works, a maintenance method statement should be developed prior to maintenance works being undertaken. 	<p>Developer and Public Open Space Management Committee</p>	<p>After construction</p>

5 ENVIRONMENTAL CODE OF CONDUCT

One of the objectives of the EMPR is to ensure that all the workforce, contractors, sub-contractors and construction staff have an understanding of environmental issues and potential impacts on site activities. This environmental code of conduct provides the basic rules that should be strictly adhered to. It is the responsibility of the ECO to ensure that each contractor, sub-contractor and workforce understand and adhere to the Code of Conduct.

ENVIRONMENTAL CODE OF CONDUCT

ALL PERSONS ARE OBLIGED TO KEEP TO THE RULES OF THIS CODE OF CONDUCT

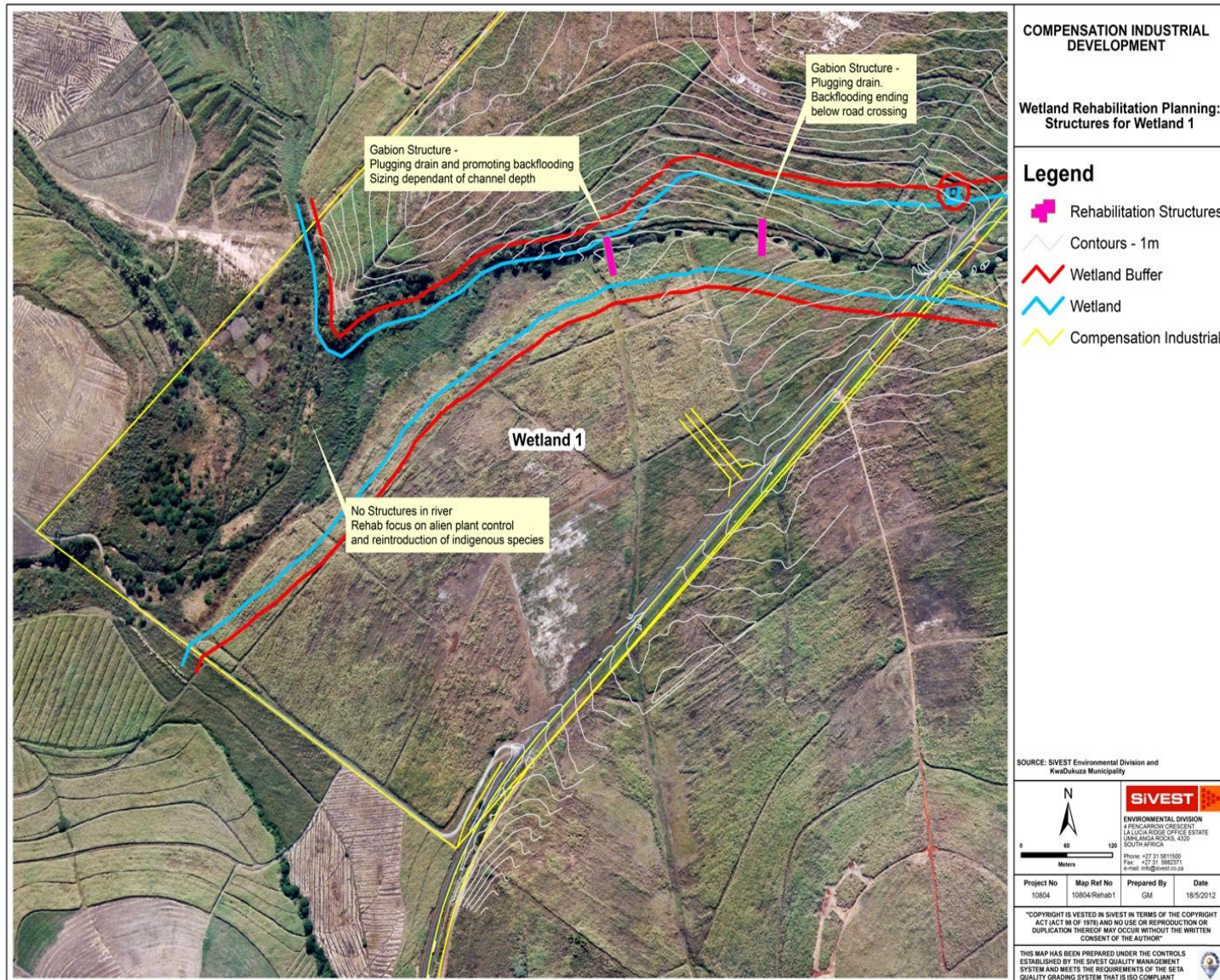
You must study and keep to the rules – ignorance, negligence, recklessness or a general lack of commitment will not be tolerated!

ENVIRONMENTAL RULES

- Preventing Pollution
- Littering will not be tolerated.
- Put all waste in the correct waste containers provided.
- Use the toilet facilities provided.
- Immediately report to your supervisor when you spill, or notice a hazardous substance being spilled or when you see a vehicle, piece of machinery or container that is leaking fuel, oil or other hazardous substances.
- Do not Trespass
- Never climb over any fence or trespass on private property. You are not allowed to enter neighbouring properties.
- Maintaining the Character and Visual Quality of the Area
- Never deface, draw or cut lettering or any other markings on trees, rocks or buildings in the area.
- Digging, excavation and the erection of any permanent or semi-permanent structures of any kind are prohibited.
- If you spot any litter lying around – please pick it up and throw it in the correct waste container.
- Fire Control
- Make sure you are familiar with fire fighting procedures.
- Make sure you are aware of the locations of all fire fighting equipment.
- No fires are allowed outside the confines of the Construction Camp.
- No burning of waste is allowed.
- Caring for Plants and Animals
- Strictly leave all animals alone – never tease, catch or set devices to trap or kill any animal.
- Never damage, chop down or remove any tree or shrub (unless you are instructed to do so).
- Use commercially bought firewood.

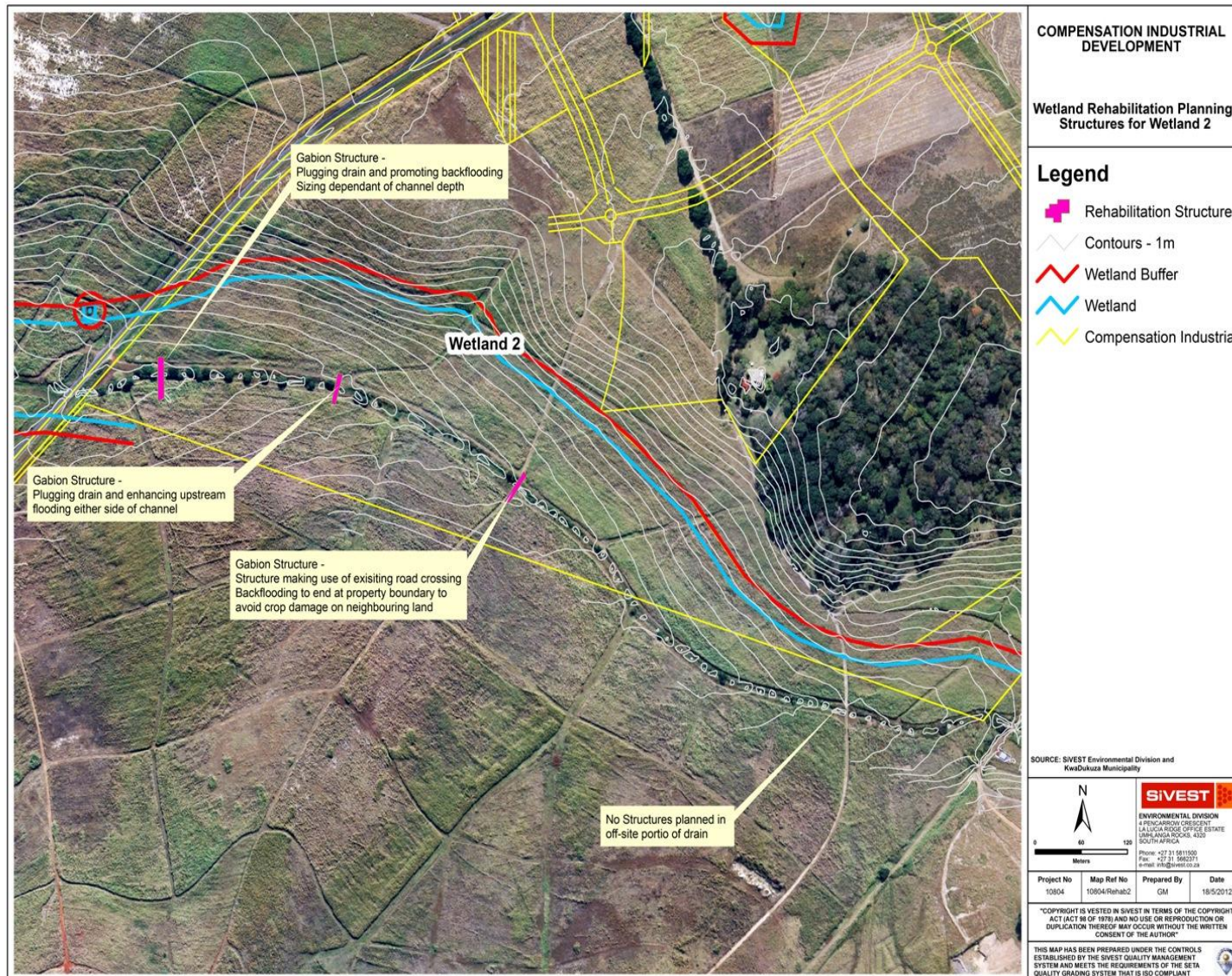
Appendix A

Wetland 1



Appendix B

Wetland 2



Appendix C

Wetland 3

