

FINAL ENVIRONMENTAL MANAGEMENT PROGRAMME

**PROPOSED INTEGRATED HUMAN SETTLEMENT (TOWNSHIP),
SIYATHUTHUKA EXTENSION 5 ON PORTION 13 OF THE FARM
KLIPFONTEIN No. 385JS, BELFAST, EMAKHAZENI LOCAL
MUNICIPALITY, MPUMALANGA PROVINCE.**

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1. ENVIRONMENTAL MANAGEMENT PROGRAMME

1.1 Introduction

Emakhazeni Local Municipality intends to establish an integrated human settlement development on portion 13 of the Farm Klipfontein No. 385 JS, Belfast.

The proposed establishment of the Integrated Human Settlement (Township) on Extension 5 will involve:

- Residential-1 260 erven
- Public Open Space 2 erven
- Residential-3 3 erven
- Municipal 2 erven
- Institutional 1 erven
- Business 1 erven

The Environmental Assessment Practitioner (EAP), Wandima Environmental Services (Environmental Consultants) was appointed to obtain authorization in terms of Chapter 5 of the National Environmental Management Act (Act 107 of 1998) in order to proceed with the proposed construction activities listed in the EIA Regulations as published in Government notices No's. R543 and 544 of June 20, 2010. As partial requirement the services of an Environmental Control Officer (ECO) may be required to monitor compliance with the conditions set by the authorisation. For this reason the tasks and responsibilities of all role players are also included.

Details of EAP

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1.1.1 Location

The proposed integrated Human Settlement (Township) development, Siyathuthuka Extension 5, is situated on Portion 13 of the farm Klipfontein No. 385-JS, Belfast. The proposed development site is located approximately 9-10km north-west of the town Belfast. The extension is bordered by Siyathuthuka Extension 2 in the south, Portion 1 of the Farm Mineraal 394JS in the north-west and Portion 1 of the Farm Paardeplaats 380JT in the south-east.

1.1.2 Activity

On 20 June 2010, the National Department of Environmental Affairs (NDEA) promulgated the new EIA regulations that must be adhered to in terms of sections 24(2)(a) and 24(d) of the NEMA (1998). This proposed development triggers a listed activity (Activity 23 (i)) according to the EIA Regulations published in Government Notice R544. The listed activity is:

R544 of June 20, 2010 - activity No 23: The transformation of undeveloped vacant or derelict land to-

(i) residential, retail, commercial, recreational, industrial or institutional use, inside an urban area, and where the total area to be transformed is 5 hectares or more, but less than 20 hectares.

R 544, 20 June 2010	23 (i)	i. establishment of 260 residential-1 erven, 2 public open space erven, 3 residential-3 erven, 2 municipal erven, 1 institutional erven and 1 business erven in an area of approximately 11, 69 hectares.
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1.2 Terms of Reference

Wandima Environmental Services were appointed by Sisonke Development Planners to compile the Environmental Management Programme (EMP) and submit it to the competent authority as condition of the general authorization. The applicant for the proposed development is Emakhazeni Local Municipality.

The applicant is responsible for compliance with the provisions for Duty of Care and Remediation of Environmental Damage contained in Section 28 of the National Environmental Management Act (Act 107 of 1998).

1.2.1 Objectives

The Environmental Management Programme (EMP) will form the basic tool for reducing the magnitude of impacts and suggesting practical measures to attain this. It is also used to measure compliance by the applicant. It is this tool that gives guidance during monitoring, auditing and taking corrective actions during its implementation, thereby ensuring continuous monitoring of the environment. An EMP is developed after an environmental assessment, depending on the level of such assessment. It can also be drawn after the authorisation by the environmental authority, to incorporate the conditions of the authorization to reach environmental and social sustainability during project implementation and operation.

Key sustainability principles emphasised include:

- Development must not irreversibly degrade the natural, built, socio-economic and governance resources on which it is based.
- Current actions should not cause irreversible damage to natural and other resources, as this potentially prevents the realisation of future sustainable options.
- Where there is uncertainty about the impact of activities on the environment, caution should be in favour of the environment.
- Land use and environmental planning need to be integrated.
- Immediate and long-term actions need to be identified and planned for, so that urgent needs can be met while still progressing towards longer-term sustainable solutions.

An EMP is implemented throughout the project life-cycle, i.e. during pre-construction, construction, operation and decommissioning, in order to minimize negative impacts and enhance positive ones. An effective EMP will be a practical working document that sets out the requirements and the goals required in mitigation. The main terms of the EMP will be detailed to achieve the following:

- To define measures to be taken during pre-construction, construction, and operation and decommissioning/closure;
- To define the actions needed to implement those measures;
- To describe how these will be achieved;
- To allocate responsibilities;
- To provide time frames.

1.3 Implementation Responsibilities of the EMP

1.3.1 *The Applicant*

The applicant is responsible for ensuring that the activity is implemented according to the requirements of the EMP. The applicant must ensure that relevant professionals are appointed to perform functions as required by the authorities and legislation. The applicant will have the following responsibilities:

- To ensure that there is sufficient allocation of resources to the professional role players to perform their tasks in terms of the EMP;
- In event that the Environment is negatively affected, the applicant will be responsible for rehabilitation and restoring the affected areas to an acceptable level;
- The applicant must include the EMP with all tender and contractual documents in order to ensure that all parties involved are bound to the terms of the EMP;
- The applicant must provide the contractor with a copy of the EMP and any other relevant documentation or supporting documents.

1.3.2 *The Contractor*

The contractor is bound to the terms and conditions of the EMP by way of the contract with the applicant. The contractor must be familiar with the terms of the EMP before commencement of the activities on site and must request clarification on any issues that are unclear. The main responsibilities of the contractor are as follows:

- The contractor must comply with all the terms and conditions of the EMP and must ensure that all sub contractors are inducted with the EMP and comply with the terms of the EMP;
- The contractor must attend a site inspection and orientation session with the ECO to identify and be informed of the sensitive elements of the site and take cognizance of the boundaries of the construction area. The ECO must point out any particular site-specific elements of importance;
- The contractor must ensure that the construction crew attends an environmental briefing and training session presented by the ECO prior to commencing activities on site;
- The contractor must adhere to all verbal and written orders given by the Environmental Control Officer (ECO) or other responsible persons (project manager or site engineer) in terms of the EMP;

1.3.3 *Services and Duties of the Environment Compliance Officer (ECO)*

The Environmental Control Officer (ECO) is an independent person, appointed by the applicant, who must monitor compliance with the environmental management programme. The main responsibilities and duties of the ECO are as follows:

- The priority of the ECO is to ensure that the site environment is not negatively affected by the proposed activities and that minimal environmental damage is done during construction and adequate measures are emplaced to ensure that future operations and maintenance does not significantly impact on the environment;
- The ECO will oversee the environmental aspects of the development and ensure compliance with the EMP;
- The ECO shall liaise with relevant authorities and keep records of all correspondence with external Interested and Affected Parties (I&APs);
- To ensure that the proponent, construction team, the operational and maintenance workers are acquainted with their responsibilities;
- To ensure compliance with regulatory authorities requirements;
- To respond to changes in the project implementation not considered during the assessment phase, and respond to unforeseen events;
- To verify environmental performance through information on impacts as they occur;
- To establish proper communication channels and provide feedback for continual improvement.

a) *Mandate and Reporting Duties of the ECO*

One of the main responsibilities of the ECO is reporting to the competent authority which will be in form of monthly audit reports. These reports will consist of descriptions of the general state of the site and will include specific reference to non-compliance and corrective measures to address non-compliance and significant impacts. Site inspections will therefore form the basis for the ECO to compile these reports. In order to perform these duties efficiently, the ECO has the right:

- To enter the site and undertake monitoring and auditing at all times;
- To appoint the necessary specialists in order to monitor or take corrective measures to address significant impacts.

An Environmental Log sheet will be kept to keep record of any non-compliance, incidents and impacts that have significant impacts on the environment.

b) *Liaising duties of the ECO*

In order to fulfil his/her duties the ECO will have to participate at all levels of the project. An integral part of this will be liaising with the following institutions/persons:

- Competent and relevant authorities;
- The applicant and contractor;
- All external Interested and Affected Parties;

c) *Appointment duties of the ECO*

The EMP as compiled by the Environmental Consultant will be used by the ECO as basis for environmental monitoring and compliance auditing.

These duties are termed as follows in the EMP:

- The ECO will identify sensitive habitats and individual plant species that must not be damaged during construction and clearly demarcate these plants and habitats with danger tape or fencing;
- The contractor must attend a site inspection with the ECO to be orientated with the sensitive aspects of the site and take cognizance of the boundaries of the construction area. The ECO must point out any site-specific aspects of importance on the site;
- The ECO must form part of the project management team and form part of decision making relevant to the environment;
- The ECO shall liaise with relevant authorities and keep record of all correspondence with external interested and affected parties;
- The ECO must monitor the emergence alien/invasive species and weeds on a monthly basis. If such species are recorded, the ECO must instruct the responsible person to remove or control these species according to the most effective methods as given in relevant literature;
- The ECO must arrange an environmental briefing and training session with the contractor and his crew prior to commencement of construction activities.

d) ***Environmental Incidents***

In order for the EMP to be efficient in case of any environmental incidents, the following criteria should be adhered to:

- In the event of a significant environmental incident, the contractor must notify the ECO and/or the authorities within 24 hours of occurrence;
- Investigate the cause of the incident and compile an environmental incident report;
- Take corrective measures to mitigate the incident;
- Rehabilitate any residual damage to the environment;
- Introduce alternative operating procedures and/or technology to prevent a recurrence of the incident;

1.3.4 Constraints and Availability of Resources

The relevant basic documentation (including copies of the Authorisation and EMP) as well as correspondence must be made available to the ECO in order to compile the necessary documentation for the environmental monitoring. Any constraints should be recorded.

1.3.5 Legal Requirements

Legislation and guidelines that will be considered during the Environmental Monitoring process are as follows:

- Constitution of the Republic of South Africa (No. 108, 1996)
- National Environmental Management Act (No. 107, 1998)
- National Environmental Management: Biodiversity Act (No. 10, 2004)
- National Environmental Management: Protected Areas Act (No. 57, 2003) as amended by the National Environmental Management: Protected Areas Amendment Act (No 31 of 2004)
- National Environment Management: Waste Act, 2008 (No 59 of 2008)
- National Water Act (No. 36, 1998)
- National Heritage Resources Act (No. 25,1999)
- Mpumalanga Nature Conservation Act (No. 10, 1998)
- Occupational Health and Safety Act (No. 85, 1993)
- Conservation of Agricultural Resources Act (No. 43, 1983)
- National Environment Conservation Act (No 73, 1989)
- National Roads Act (No. 7. 1998)
- Advertising on Roads and Ribbon Development Act (No 21, 1940)
- Promotion of Access to Information Act (No 2, 2000)
- Electricity Regulation Act (No. 4, 2006)
- Local Government: Municipal Systems Act, 2000
- EIA regulations as listed in Government Notices R543 and R544 (20 June 2010)

1.4 Summary/Mitigation Plan-Table

This final EMP should be used as a legal document as well as an environmental auditing format.

The EMP for this project is included with Tables 1-10. These tables list the key activities and relate these activities with resulting environmental impacts identified during the EIA process as well as the conditions included with the authorization granted by the competent authority. Mitigation measures are also included with the aim of reducing the magnitude of negative impacts and to enhance potential positive impacts.

Table 1: Managing of impacts on surface and groundwater

Relevant Activities		<ul style="list-style-type: none"> ▪ Construction of roads, services infrastructure, dwellings; ▪ Construction of a camp; ▪ Material Stockpiles; ▪ Personnel discipline. 			
Environmental Statement					
EMP Ref:	Environmental Impact/Aspect	Mitigation	Phase	Monitoring	Responsibility
T1.1	Affect on Water quality	a) Adequate sedimentation control measures must be instituted at all prominent drainage lines, water crossings and construction trenches. b) Where possible construction activities must be positioned away from drainage lines and areas with a perched water table. c) All fuel, chemicals, oil, etc. must be confined to areas where the drainage of water can be controlled. Use appropriate structures and methods for storage and handling. d) No dumping of foreign material in streams, rivers and/or wetland areas is allowed. e) No washing and or cleaning of clothes, eating utensils, tools or equipment allowed in water bodies. f) Adequate sanitation for all personnel to be supplied on site. g) No permanent stockpiling of any kind allowed within the 1:100 year flood line or within 10m of any water courses. h) Wetlands as well as crossings must be avoided. i) A water use permit should be sought from DWAF for any construction activities undertaken on or near wetlands. j) In addition, no construction activities shall commence before obtaining a water use permit, for areas near or on wetlands.	Construction	Weekly	Contractor
T1.2	Affect on water courses	a) Occurrence of erosion and silt generation has to be monitored during operational phase and corrective measures taken if necessary.	Operational	Throughout construction	ECO Applicant
T1.3	Storm water	a) The storm water from the township will be controlled by V-shaped drains. Storm water will be disposed off into the natural area at points where the volume of water becomes too much to be accommodated by the V-drain shaped drains. Energy breakers in the form of natural rock will be created at these disposal points and erosion control measures will be implemented.	Construction	Throughout construction	Applicant

Table 2: Managing of impacts on soil

Relevant Activities		<ul style="list-style-type: none"> ▪ Construction camp; Personnel discipline; ▪ Materials Stockpiles. 			
Environmental Statement					
EMP Ref:	Environmental Impact/Aspect	Mitigation	Phase	Monitoring	Responsibility
T2.1	Degrading of soil structure	a) Before construction, vegetation and topsoil must be stripped and stockpiled separately to prevent removal and compaction by vehicles. It must be used for future rehabilitation purposes. b) Topsoil shall be stockpiled in heaps not exceeding 2.0m in height and be protected from erosion. c) Re-usable subsoil stripped from construction sites must be stockpiled separately and clearly identified as such. d) Soil must not be stockpiled on drainage lines or near watercourses. e) Deficiency of backfill material will not be made up by excavation within the remainder of the development area. Where backfill material is deficient, it must be made up by importation from an approved borrow pit.	Construction	Weekly	Contractor ECO

T2.2	Soil Erosion	a) Appropriate soil erosion and control procedures must be applied to all embankments that are disturbed and destabilized.	Construction	Daily	Contractor
		b) Occurrence of erosion has to be monitored during operational phase and corrective measures taken if necessary.	Operational	Weekly	ECO
T2.3	Pollution of soil	a) Avoid contamination of soil with oil, diesel, petrol, waste or any other foreign matter, which may impact on the capability of the soil as a growth medium.	Construction	Daily	Contractor ECO
		b) All equipment to be inspected daily for oil or fuel leaks before it is operated. Leakages must be repaired on mobile equipment or containment trays placed underneath immobile equipment until such leakages has been repaired.			
		c) Contaminated soil has to be: <ul style="list-style-type: none"> o Removed up to depth 300mm below the saturation mark; o Disposed at permitted landfill site; 			
		d) The soil can be regenerated by using bio-remediation methods.			
		e) Hazardous substances to be stored on lined surfaces and be surrounded by berms to prevent pollution.			
		f) Divert storm water from stockpiles and other sites sensitive to erosion.			

Table 3: Managing of construction impacts and general environmental pollution

Relevant Activities		<ul style="list-style-type: none"> ▪ Construction camp: Personnel discipline; ▪ Materials Stockpiles. 	Environmental Statement		
EMP Ref:	Environmental Impact/Aspect	Mitigation	Phase	Monitoring	Responsibility
T3.1	Construction disturbances and waste disposal	a) Construction methods must be respectful of the environment – no unnecessary vegetation clearing, excavations or untidiness.	Construction	Daily	Contractor
		b) Concrete mixing will be done on pre-designed slabs underlined by PVC lining, on an area previously disturbed. Alternatively, maintain one mixing site and transport the concrete to the construction site.			
T3.1	Construction disturbances and waste disposal	c) Any concrete spillage must be cleaned immediately.	Decommissioning	Weekly	ECO
		d) Littering on site and the surroundings areas is prohibited. Clearly marked litterbins must be provided on site. The contractor's representative must monitor the presence of litter on the work sites as well as the construction campsite. All bins must be cleaned.			
		e) Waste must be disposed, as soon as possible and not be allowed to stand on to decay, resulting in bad odours and attracting vermin.			
		f) Adequate sanitation and water supply must be installed for the construction personnel (authorization from DWAF may be required).			
		g) All waste removed from site must be disposed at the municipal/permitted waste disposal site.			
		h) The contractor must ensure that all temporary structures, materials, waste and facilities used for construction activities are removed upon completion of the project.			
		i) The contractor must clean up and restore all disturbed areas and implement rehabilitation measures where as required by ECO.			
T3.2	Air pollution & Generation of Dust	a) Speed limit must be enforced in all areas to limit the levels of dust pollution.	Construction	Daily	Contractor
	b) Air pollution caused during construction can be limited by using dust suppression methods such as water spraying. Water used for this purpose must be in quantities that will not result in the generation of run-off.				
	c) The contractor's representative or environmental officer must notify all people living within 100m of the construction site about the proposed activities.				
	d) In the event of serious levels of dust pollution, the implementation of constant dust monitoring by qualified consultants must be undertaken.				
	e) Vehicles used on, or entering the site must be serviced regularly to ensure that they do not emit smoke or fumes.				
	f) No refuse waste is to be burned on the premises or on surrounding premises.				

T3.3	Noise pollution	<p>a) Noise control measures must be implemented. All noise levels must be controlled at the source.</p> <p>b) All employees must be given the necessary ear protection gear if the noise levels exceed 70dB.</p> <p>c) Interested & Affected parties must be informed about impending excessive noise.</p> <p>d) Generators and pumps must be housed in casings to help reduce any noises in operation.</p> <p>e) No loud music or excessive noise generated by employees is allowed on site and in construction camps.</p>	Construction	Daily	Contractor
T3.4	Noise and Dust	a) Dust and noise generation should be monitored during operational phase.	Operational	Daily	Applicant

Table 4: Managing of impacts on biodiversity

Relevant Activities		<ul style="list-style-type: none"> ▪ Construction of roads, services infrastructure, dwellings; ▪ Site selection; ▪ Personnel discipline. 	Environmental Statement		
EMP Ref:	Environmental Impact/Aspect	Mitigation	Phase	Monitoring	Responsibility
T4.1	All aspects	a) The mitigations and recommendations submitted in the Biodiversity Reports (as part of the specialist studies for the EIA) must be included as an addendum to the EMP and adhered to where so required by the authority.	All phases		Contractor ECO Applicant
T4.2	Loss of Vegetation and Habitat	<p>a) In view of the potential conservation of the proposed development area, site-specific ecological field surveys are recommended before development commences.</p> <p>b) Areas of the natural vegetation as identified in the Ecological Specialist report must be demarcated and cordoned off during construction. Areas identified as rocky habitats should be conserved as zones of no-development and buffer zones should be allocated to such areas.</p> <p>c) The demarcation of these habitats must be done in consultation with the ECO.</p> <p>d) The ecologist must site the actual house footprint with the surveyor and/or owner.</p>	Planning Construction	Monthly	ECO Contractor
T4.3	Death and Injury of animals	<p>a) Avoid injury to or death of wild animals by reducing speed of construction vehicles.</p> <p>b) Trenches must be inspected daily to monitor for trapped animals.</p>	Construction	Daily	Contractor ECO
T4.4	Illegal Removal of vegetation	<p>a) Any evidence of plant theft (especially protected species) must be followed up with prosecution and penalties levied on the construction company.</p> <p>b) Construction teams will not, as a contractual obligation, be allowed to collect firewood or any other plant resources from surrounding vegetation, notably outcrops and riparian areas. Any evidence of this must be followed up with prosecution and penalties levied on the construction company</p>	Construction	Daily	Contractor ECO
T4.5	Protected species	<p>a) Prior to vegetation clearing, the development footprint must be surveyed for plant species of conservation concern.</p> <p>b) Protected plants occurring within the footprint should be relocated in consultation with an approved specialist after obtaining the necessary permits from authorities.</p> <p>c) All protected species occurring within the footprint should be clearly marked for the duration of the construction phase, and should remain intact and undisturbed. If this is unavoidable, the contractor must follow procedures as advised by the ECO.</p> <p>d) Important flora that may become apparent at a later stage should be reported to a specialist and the authorities and be relocated or conserved.</p>	Planning Construction	Continuous	ECO Contractor
T4.6	Spreading of weeds	a) Where alien invasive plants occur they must be uprooted, cut and /or chemically treated. (Use only approved chemicals).	Construction	Monthly	Contractor ECO

T4.7	Management of fauna	<ul style="list-style-type: none"> a) No wild animal may under any circumstance be handled, removed or be interfered with. b) No wild animal may be fed on site. c) No domesticated animals (i.e. chickens and pigs) will be permitted at the staff village and/or campsite as well as on the remainder of the property (including dogs, cats). d) If applicable, regularly undertake checks of the surrounding natural vegetation, in fences and along game paths to ensure no traps have been set. Remove and dispose of any snares or traps found on or adjacent to the site. e) Problem animals and vermin need to be removed by an appropriate organization or authority (i.e. such as the Parks Board, the SPCA or a registered exterminator). f) Do not make use of any pesticides, unless approved by the Project Management Team. g) Important flora that may become apparent at a later stage should be reported to a specialist and the authorities and be relocated or conserved. 	Construction Operational	Daily	Contractor ECO Applicant
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Table 5: Managing visual impacts

Relevant Activities		▪ Visual impacts			
Environmental Statement					
EMP Ref:	Environmental Impact/Aspect	Mitigation	Phase	Monitoring	Responsibility
T5.1	Planning & Design	<ul style="list-style-type: none"> a) Alignment of structures should be compatible with the natural contours. b) Built structures should not break the horizon. c) Make use of existing access roads where possible d) Make use of existing servitudes as far as possible. e) Avoid a linear path of cleared vegetation that would strongly contrast with the surrounding landscape character. 	Planning		Applicant
T5.2	Construction aspects	<ul style="list-style-type: none"> a) The contractor must ensure that the site is kept tidy at all times, that sufficient refuse bins are provided, and that they are emptied regularly. b) Refuse or building rubble generated on the premises must not be deposited on adjacent properties, road verges or open spaces. It must be contained on site, then removed and disposed of at an approved dumping site at least every two weeks. c) Disturbed and open areas must be rehabilitated and re-vegetated as soon as possible after construction. d) The construction site must be enclosed by a dark green or black shade cloth of no less than 2m high, to prevent any visual intrusion. 	Construction	Daily	Contractor ECO
T5.3	Operational aspects	<ul style="list-style-type: none"> a) Rehabilitate all disturbed areas. 	Operational	Yearly	Applicant

Table 6: Managing of construction camp/personnel

Relevant Activities		<ul style="list-style-type: none"> ▪ Construction camps ▪ Personnel discipline ▪ Security ▪ Safety 			
Environmental Statement					
EMP Ref:	Environmental Impact/Aspect	Mitigation	Phase	Monitoring	Responsibility
T6.1	Social disturbances	a) Prior to establishing the construction camp, the contractor shall produce a plan showing the positions of all structures, lay-down yards and other infrastructure for approval by the ECO. b) Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a firebreak shall be cleared around the perimeter of the camp and office sites. c) Construction & maintenance activities must be of such a nature as not to disturb the livelihood of adjacent property owners. d) A designated place for food preparation and eating must be established at the construction site. e) Dry chemical toilets must be made available at a ration of 1 toilet per 10 staff, within the campsite perimeter and must be cleaned and serviced as requested by the service provider. f) Workers movements must be limited to the construction area only and must be enforced in terms of the contracts of appointment. g) Any complaints must be addressed accordingly with the Community Liaison Officer (CLO) and record must be kept thereof. h) The applicant must ensure that measures are in place to prevent/mitigate disruption of services as result of construction. i) Residents have to be notified 7 days in advance of disruptions to services.	Construction	Daily	Contractor ECO

Table 7: Managing of fire hazards, safety and security

Relevant Activities		<ul style="list-style-type: none"> ▪ Construction camps ▪ Personnel discipline ▪ Security ▪ Safety 			
Environmental Statement					
EMP Ref:	Environmental Impact/Aspect	Mitigation	Phase	Monitoring	Responsibility
T7.1	Fire precautions	a) Take adequate precautions to ensure that fires are not started as a result of Works on site: the Contractor will be held liable for any damage to property adjoining the Site as a result of any fire caused by one of his employees. b) Establish and maintain fire breaks around the Work Sites if as and when specified by the Project Management Team and as required by applicable legislation and the local authority. c) Do not permit any fires or open flames in the vicinity of a wetland, especially during the dry season. A minimum requirement for construction in a high fire risk area is a water truck or cart, with a minimum capacity of 5000 litres, equipped with pump and hose (minimum length 30m), which must be permanently on site, where veld fire is at risk. d) Ensure that the Work Site, the contractor's camp and all living quarters are equipped with adequate fire fighting equipment. This includes at least rubber beaters when working in veld areas, and at least one fire extinguisher of the appropriate type irrespective of the site. Take immediate steps to extinguish any fire, which may break out on the construction site. e) No open fires are permitted on site, except in designated cooking area where adequate precautions need to be taken to prevent the spread of fire. Restrict contained fires for heating and cooking (i.e. in a fire drum) to designated areas on site. Prevent employees from creating fires randomly outside designated areas.	Planning Construction	Weekly	Contractor

T7.2	Security	<p>a) The contractor's representative or environmental officer must inform all adjacent landowners of any after-hour construction activities and any other activity that could cause a nuisance e.g. the application of chemicals to the work surface. Normal working hours are between 07h00 and 17h00 Monday to Friday. Arrangements are to be made with the Local Authority for after-hours work.</p> <p>b) Staff members residing in the construction camp will not be allowed to cause a nuisance to any neighbouring homesteads or dwellings. In the event of a complaint received from the adjacent land owners, the privilege to reside on the property will be cancelled immediately.</p> <p>c) No random cooking fires are to be allowed on construction sites except in designated cooking areas.</p>	Construction	Daily	Contractor
T7.3	Safety	<p>a) Best practice methods must always be employed and appropriated regulations adhered to.</p> <p>b) No open trenches are permitted without the use of demarcation tape.</p> <p>c) Speed limits must be enforced in all areas, including public roads and private property to avoid potential accidents.</p> <p>d) There must be a first aid facility on site.</p> <p>e) Regular auditing of safety requirements must be undertaken in order to monitor and control the problems before they become unmanageable.</p> <p>f) Workers rights to refuse work in unsafe condition must be respected.</p> <p>g) A record must be kept of all incidents on site.</p> <p>h) Personnel must be trained in basic site safety procedures (safety talks).</p> <p>i) Secure storage of materials on site particularly hazardous material e.g. chemicals and fuels.</p> <p>j) Adequate signage on and off the site about potential hazards must be provided.</p> <p>k) Controlled accesses will be constructed to manage the movement of vehicles and public in and out of the development site.</p> <p>l) Members of the general public must not be allowed near the construction site.</p> <p>m) Do not store any fuel or chemicals under trees.</p> <p>n) Do not permit any smoking within 3m of any fuel or chemical storage area, or refuelling area.</p> <p>o) The contractor must keep a first aid kit and telephone numbers of local emergency services in prominent positions at the staff quarters and the site office. All personnel must be made aware of these locations.</p> <p>p) The contractor on site during the construction phase must provide safety and security arrangements that should ensure that:</p> <ul style="list-style-type: none"> o The handling of equipment and material is supervised: o Construction vehicles are maintained and controlled by competent personnel o All excavated areas are clearly marked and that barrier tape is placed around them 	Construction	Daily	Contractor ECO

Table 8: Site clean up and rehabilitation

Relevant Activities		<ul style="list-style-type: none"> ▪ Lack or delay of rehabilitation may negatively impact on the aesthetic nature of the area and also cause long-term environmental damage. 			
Environmental Statement					
Ref:	Environmental Impact/Aspect	Mitigation	Phase	Monitoring	Responsibility
T8.1	Rehabilitation of environmental damage	a) The Environmental Control Officer must ensure that all temporary structures, materials, waste and facilities used for construction activities are removed upon completion of the project. b) Upon completion of the construction period, the ECO will ensure that any/all temporary access roads are returned to a state no worse than prior to construction commencing. c) Once heavy machinery has cleared the bulk of these material stockpiles, the disturbed areas will be levelled and cleared of any foreign material manually. d) Fully rehabilitate all disturbed areas and protect them from erosion. e) Slopes must be designed according to predefined specifications, aimed at the prevention of soil erosion, of efficient storm water control, of the eventual re-establishment of vegetation and of ultimately achieving aesthetically acceptable landscapes. f) In general, no slopes steeper than 1(V):3(H) must be allowed. g) Cut slopes must not be steeper than 1:2(V:H) and rounded off on the top edge. h) Bulk and fine shaping must be executed according to design, aimed at the prevention of soil erosion, of efficient storm water control, of the eventual re-establishment of vegetation and of ultimately achieving aesthetically acceptable landscapes. i) On all man-made slopes, the following rehabilitation methods must be applied: <ul style="list-style-type: none"> ○ Replacing and redistribution of stripped topsoil to a minimum depth of 200 mm. ○ Ripping at 300 mm but not more than 400 mm apart and parallel to contours, through the placed topsoil, to a depth of 100 mm at least, into the sub base soil below. ○ Sowing of specified grass seed mixture and fertilizer, if required. 	Post-construction	After construction	Contractor ECO
T8.2	Compliance	a) ECO to audit rehabilitation.	Post-construction	Once	ECO

Table 9: Managing of heritage sites and socio-economic issues

Relevant Activities		<ul style="list-style-type: none"> ▪ Heritage sites; ▪ Social; ▪ Economic 		
Environmental Statement				
EMP Ref:	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
T9.1	Heritage sites	a) Work in areas where artefacts are found must cease immediately. The excavation must be examined by an archaeologist as soon as possible. All necessary actions to minimize delays must be taken. b) Graves and valuable historic artefacts must be fenced off and excluded from the development.	All phases	Applicant Contractor ECO
T9.2	Socio-Economic	a) Local residents are to benefit from employment opportunities.	All phases	Applicant Contractor

Table 10: Compliance with conditions of the authorisation and monitoring

Relevant Activities		<ul style="list-style-type: none"> ▪ All Aspects of EMP ▪ Compliance ▪ Monitoring 		
Environmental Statement				
EMP Ref:	Environmental Impact/Aspect	Mitigation	Phase	Responsibility
T10.1	Compliance to EMP and authorisation	a) ECO to be employed in order to initiate the applicant and contractor as well as personnel on the subject of the EMP and authorisation and compliance thereto.	Planning	ECO
T10.2	Monitoring	a) Monitoring for any environmental impacts during the operational phase is recommended until a satisfactory standard of compliance is attained.	Construction Operational	Applicant ECO