Mzingazi Golf Estate Draft Environmental Management Plan

Ndlovu Development Trust

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Contents

1 Aim of this document

In terms of Section 28 (1) of the National Environmental Management Act (108 of 1998) (NEMA):

"(1) Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment in authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment. (2)…the persons on whom subsection (1) imposes and obligation to take reasonable measures, including and owner or land, a person in control of land or premises, or a person who has a right to use the land or premises on which or in which – (a) any activity or process is or was performed or undertaken; or (b) any other situation exists, which causes or has caused or is likely to cause significant pollution or degradation of the environment. (3) The measures required in terms of subsection (1) may include measures to – (a) investigate, assess and evaluate the impact on the environment; (b) inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed in order to avoid causing significant pollution or degradation of the environment; (c) cease, modify or control any act, activity or process causing pollution or degradation; (d) contain or prevent the movement of pollutants or the causant of degradation; (e) eliminate the source of the pollution or degradation; or (f) remedy the effects of the pollution or degradation…"

Thus, the aim of this Environmental Management Plan (EMP) is to identify and minimise, as far as possible, potential impacts that the proposed construction of the housing development may have on the surrounding biophysical and socio-economic environment.

The EMP will serve as the environmental input to the contractors tender to ensure that the contractor complies with all the necessary management actions and incorporate this cost into the tender budget. The purpose of the EMP 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;

  Prevent or minimise all forms of pollution;

  Protect indigenous flora and fauna;

  Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment; and,

  Adopt the best practicable means available to prevent or minimise adverse environmental impacts.
- Develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of wastes;
- Describe all monitoring procedures required to identify impacts on the environment; and,
- Train employees and contractors with regard to environmental obligations.

2 Environmental Awareness and Compliance

2.1 RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT

An independent environmental consultant will arrange for inspections of the construction activities and EMP implementation throughout the project. After each inspection, the ECO will produce a monitoring report that will be submitted to the KwaZulu-Natal Department of Agriculture and Environmental Affairs (DAEA). Relevant sections of the minutes of customary site meetings will be attached to the monitoring report.

The Contractor and / or its agents will be responsible for environmental management on site during the construction period. A pre-construction meeting is recommended in order to reach agreement on specific roles of the various parties and penalties for non-compliances with the EMP. In addition surrounding residents, tenants or land owners must be notified in advance of any potentially disturbing activities.

2.2 TRAINING AND INDUCTION OF EMPLOYEES

The Contractor has a responsibility to ensure that all those people involved in the project are aware of and familiar with the environmental requirements for the project. The EMP shall be part of the Terms of Reference (ToR) for all Contractors, Sub-contractors and Suppliers. All Contractors have to give some assurance that they understand the EMP and that they will undertake to comply with the conditions therein. All senior and supervisory staff members shall familiarise themselves with the full contents of the EMP. They shall know and understand the specifications of the EMP and be able to assist other staff members in matters relating to the EMP.

An environmental awareness training programme for all staff members shall be put in place by the contractor. Before commencing with any work, all staff members shall be appropriately briefed about the EMP and relevant occupational health and safety issues.

2.3 COMPLAINTS REGISTER AND ENVIRONMENTAL INCIDENT BOOK

Any complaints received from the community must be registered and recorded by the contractor on site. The complaint must be brought to the attention of the site manager and ECO, who will respond accordingly. The following information will be recorded:

- Time, date and nature of the complaint;
- Response and investigation undertaken; and
- Actions taken and by whom.

All complaints received will be investigated and a response (even if pending further investigation) is to be given to the complainant within 7 days.

All environmental incidents occurring on the site will be recorded. The following information must be provided:

- Time, date, location and nature of the incident; as well as,

- Actions taken and by whom.

2.4 ENVIRONMENTAL MONITORING

Environmental monitoring of the construction of the housing development will be undertaken by the Environmental Control Officer (ECO) on a monthly basis. Monitoring will be undertaken to ensure compliance with all aspects of the EMP.

In order to facilitate communication between the ECO, Resident Engineer (RE) and Contractor, it is important that a suitable chain of command is structured that will ensure that the ECO's recommendations have the full backing of the project team before being conveyed to the Contractor. In this way, penalties as a result of non-compliances with the EMP may be justified as failure to comply with instruction from the highest authority.

2.5 NON-COMPLIANCE WITH THE EMP

Difficulties may be encountered with carrying out mitigation measures that could result in future non-compliance. The Contractor shall put in place procedures to motivate staff members to comply with the EMP, and to deal with acts of non-compliance, or malicious damage to the environment. Penalties for non-compliance need to be discussed with the Contractor at the earliest stage (during the Pre-Construction Meeting).

2.6 EMP AMENDMENTS / EMP INSTRUCTIONS

No EMP amendments (relaxation or revision of any mitigation measure) shall be allowed without approval from the relevant authority (DAEA). Motivations for amendments to the EMP may be discussed with WSP Environmental Consultants (WSPE). WSPE may propose EMP amendments on behalf of the proponent or issue EMP instructions (corrective actions, remediation and rehabilitation). These amendments or instructions issued by WSPE shall be implemented within the specified time frame.

3 Macro Legislative Framework

3.1 THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA ACT (108 OF 1996)

The Constitution of the Republic of South Africa is the legal source for all law, including environmental law, in South Africa. The Bill of Rights is fundamental to the Constitution of the Republic of South Africa and in, Section 24 states that:

Everyone has the right (a) to an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

3.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (107 OF 1998)

NEMA is South Africa's overarching environmental legislation and has, as its primary objective to provide for co-operative governance by establishing principles for decision making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by

organs of state and to provide for matters connected therewith (Government Gazette, 1998)

The Act provides for the right to an environment that is not harmful to the health and well being of South African citizens; the equitable distribution of natural resources, sustainable development, environmental protection and the formulation of environmental management frameworks (Government Gazette, 1998). Section 30 (1, 3 and 4) of the NEMA states that:

(1) (a) "incident" means an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to the public or potentially serious pollution of or detriment to the environment, whether immediate or delayed. (b) "responsible person" includes any person who; (i) is responsible for the incident; (ii) owns any hazardous substance involved in the incident; or (iii) was in control of any hazardous substance involved in the incident at the time of the incident;

(3) The responsible person or, where the incident occurred in the course of that person's employment, his or her employer must forthwith after knowledge of the incident, report through the most effective means reasonably available (a) the nature of the incident; (b) any risks posed by the incident to public health, safety and property; (c) the toxicity of substances or by-products released by the incident; and (d) any steps that should be taken in order to avoid or minimise the effects of the incident on public health and the environment to; (i) the Director-General; (ii) the South African Police Services and the relevant fire prevention service; (iii) the relevant provincial head of department or municipality; and (iv) all persons whose health may be affected by the incident.

(4) The responsible person or, where the incident occurred in the course of that person's employment, his or her employer, must, as soon as reasonably practicable after knowledge of the incident; (a) take all reasonable measures to contain and minimise the effects of the incident, including its effects on the environment and any risks posed by the incident to the health, safety and property of persons; (b) undertake clean-up procedures; (c) remedy the effects of the incident; (d) assess the immediate and long-term effects of the incident on the environment and public health.

3.3 ENVIRONMENTAL CONSERVATION ACT (73 OF 1989)

In terms of Section 21 of the Environmental Conservation Act (73 of 1989) (ECA), a number of activities have been identified as activities that may have a substantial detrimental effect on the environment. These listed activities, compel the applicant to follow the full EIA process and may include:

Section 1 (d): *The construction, erection or upgrading of roads, railways, airfields and associated structures*;

Section 1(m): *The construction, erection or upgrading of public and private resorts and associated infrastructure*;

Section 2(c): *The change of land use from agricultural or zoned undetermined use or an equivalent zoning, to any other land use*; and

Section 10: *The cultivation or any other use of virgin ground**.

3.4 SUSTAINABLE DEVELOPMENT

The principle of Sustainable Development has been established in the Constitution of the Republic of South Africa (108 of 1996) and given effect by NEMA and the ECA. Section 1 (29) of NEMA states that:

"1(29)…Sustainable development means the integration of social, economic and environmental factors into the planning, implementation and decision-making process so as to ensure that development serves present and future generations."

Similarly the guiding principles established in Section 2 (3) of NEMA state that:

"2(3) Development must be socially, environmentally and economically sustainable. (4) (a) Sustainable development requires the consideration of all relevant factors including the following: (i) That the disturbance of ecosystems and loss of biological diversity are avoided, or where they cannot be altogether avoided, are minimised and remedied; (ii) that pollution and degradation of the environment are avoided, or where they cannot be altogether avoided, are minimised and remedied…(vii) that negative impacts on the environment and on peoples environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied."

Thus Sustainable Development requires that there is an integration of social, environmental and developmental concerns and that greater attention to each of these aspects of development will lead to the fulfilment of basic needs, improved living standards for all, better protected and managed ecosystems and a safer, more prosperous future (United Nations Department of Economic and Social Affairs, Division for Sustainable Development, 1992).

4 MITIGATION MEASURES

4.1 SITE ESTABLISHMENT AND PRELIMINARY ACTIVITIES

Potential environmental impacts, impact sources and objectives are described, and environmental management mitigation measures to be implemented during construction are specified. The Contractor shall adhere to these measures at all times.

Site Establishment and Preliminary Activities			
Routing	**Monitor**	**Frequency**	**✓ / ×**
▪ The location of all underground services and servitudes must be identified and confirmed.	RE	Prior to moving onto site.	
▪ The choice of access routes should take into account minimum disturbances to residents and businesses neighbouring the site.	RE	Prior to moving onto site.	
Haulage Roads	**Monitor**	**Frequency**	**✓ / ×**
▪ All temporary access roads must be planned and approved by the RE and ECO ahead of construction activities and must not be created on an *ad hoc* basis.	RE	Prior to moving onto site and during construction.	
▪ Roads must have as little cut and fill as possible.	RE	Prior to moving onto site.	
▪ Roads are to be kept, where possible, to existing tracks.	ECO	During surveys and preliminary site	

<table>
<tr><td></td><td></td><td>investigations.</td><td></td></tr>
<tr><td>■ The digging of trenches to drain wetlands during construction must be avoided.</td><td>ECO</td><td>During construction of roads.</td><td></td></tr>
<tr><td>■ Where drains are absolutely necessary for the construction of roads, they are to be suitably rehabilitated following construction.</td><td>ECO</td><td>During construction of roads.</td><td></td></tr>
<tr><td>■ No trees/shrubs/groundcover may be removed or vegetation stripped without the prior permission of the ECO.</td><td>ECO</td><td>Before and during construction.</td><td></td></tr>
<tr><td>■ Contractors must construct formal drains on all temporary haulage roads in the form of side drains and mitre drains to prevent erosion and point source discharge of run-off.</td><td>RE</td><td>Prior to moving onto site.</td><td></td></tr>
<tr><td>■ Culverts and / or gabions should be constructed under the roads to maintain the natural flows of streams and seepage areas.</td><td>RE</td><td>During construction</td><td></td></tr>
<tr><td>■ Scour check walls must be constructed in the side drains as follows:

<table><tr><th>Gradient of Road</th><th>Scour Check Spacing.</th></tr><tr><td><4%</td><td>Not required</td></tr><tr><td>5%</td><td>20m</td></tr><tr><td>8%</td><td>10m</td></tr><tr><td>10%</td><td>5m</td></tr></table></td><td>RE</td><td></td><td></td></tr>
<tr><td>■ Scour checks can be constructed from material available on site or using driven wooden pegs.</td><td>RE</td><td>During construction of temporary roads.</td><td></td></tr>
<tr><td>Survey points</td><td>Monitor</td><td>Frequency</td><td>✓ / ×</td></tr>
<tr><td>■ Roads or trails that are cut to provide temporary access for survey work must be minimised.</td><td>RE</td><td>During surveys and preliminary site investigations.</td><td></td></tr>
<tr><td>■ Marking of survey points must have the RE's approval.</td><td>RE</td><td>During surveys and preliminary site investigations.</td><td></td></tr>
<tr><td>■ Vegetation clearing must be kept to a minimum during survey operations.</td><td>ECO</td><td>During surveys and preliminary site investigations.</td><td></td></tr>
<tr><td>Layout</td><td>Monitor</td><td>Frequency</td><td>✓ / ×</td></tr>
<tr><td>■ The Contractor is to adhere to the following when selecting an alternative site for the Contractor's Camp:

Choose as level an area as possible (gradients must not exceed 1:3);</td><td>RE</td><td>During surveys and preliminary site investigations.</td><td></td></tr>
<tr><td>Avoid locating the camp within 50m of a hydrological feature (Section 1 (24 and 29) National Water Act (36 of 1998));</td><td>RE</td><td>During surveys and preliminary site investigations.</td><td></td></tr>
</table>

Locate the Contractor's Camp within an already disturbed area;	RE	During preliminary site investigations.	
■ The site selected must be approved by the ECO. If the ECO is not satisfied with the proposed site, alternative sites must be proposed and discussed with the ECO until an acceptable compromise is reached.	RE/ECO	During surveys and preliminary site investigations.	
■ Where possible cut to fill must be avoided during the establishment of the Contractor's Camp.	RE	During site establishment.	
■ The Contractor's Camp should not exceed an area of 0.5ha.	RE/ECO	During site establishment.	
■ The extent of the Contractor's Camp must be defined and fenced off and all activities must be confined within this area. The ECO must agree to any extension or change in location of the Contractor's Camp.	RE/ECO	During preliminary site investigations.	
■ The Contractor's Camp is to be maintained in a neat and orderly state at all times.	RE	Before and during construction.	
■ Provision must be made for adequate cooking and ablution facilities.	ECO	Ongoing.	
■ Gas or electricity must be used for cooking purposes to avoid the use of fires and potential stripping of the surrounding vegetation for fuel.	ECO	Ongoing.	
■ Adequate parking must be provided for site staff and visitors.	RE	During site establishment.	
Ablutions	**Monitor**	**Frequency**	**✓ / ×**
■ Potable water must be available at all times at various points within the Contractor's Camp.	ECO	Before and during construction.	
■ Where waterborne sewerage is not available a reputable company, approved by the RE, must provide portable chemical toilets. Such toilets must be available for all staff.	ECO	During site establishment.	
■ Toilets must be no closer than 50m from any natural water body watercourses (Section 1 (24 and 29) National Water Act (36 of 1998)).	ECO	During site establishment.	
■ The construction of long drop toilets is forbidden.	ECO	Ongoing.	
■ Under no circumstances may open areas or the surrounding bush be used as a toilet facility.	ECO	Ongoing.	
■ Under no circumstances may Lake Mzingazi be used as a toilet or cleaning facility by workers on site.			
Provision for Camp Waste Disposal	**Monitor**	**Frequency**	**✓ / ×**
■ An adequate number of waste receptacles must be available at strategic locations around the Contractor's Camp for gathering all domestic refuse, and to minimise littering.	ECO	Ongoing.	
■ Bins must be lined for efficient control and safe disposal of waste.	ECO	Ongoing.	
■ Recycling and the provision of separate waste receptacles for	ECO	Ongoing.	

different types of waste must be encouraged.			
▪ The excavation and use of rubbish pits on site is forbidden.	ECO	Ongoing.	
▪ A fenced area must be allocated for waste sorting and disposal.	RE/ECO	During site establishment.	
General Substances and Materials	**Monitor**	**Frequency**	**✓ / ×**
▪ Choice of location for storage areas must take into account prevailing winds, distance from water bodies and general on-site topography.	ECO	During site establishment.	
▪ The proximity of houses, schools and businesses must be taken into account when locating the storage area.	RE	During preliminary site investigations.	
▪ Storage areas must be designated, demarcated and adequately fenced if necessary.	ECO	During site establishment.	
▪ A lockable, mobile structure must be erected on an impermeable surface for storing materials, equipment, chemicals, etc.	RE/ECO	During site establishment.	
▪ Fuel tanks must meet relevant specifications and be elevated so that leaks may be detected.	ECO	During site establishment.	
▪ All fuel required on site is to be stored at the Contractor's Camp within an adequately sized bund wall that has an impermeable base. The ECO must ensure that the capacity of the bund wall is adequate to cope with a spill / leak of the fuel storage container.	RE/ECO	During site establishment.	
▪ An overflow pipe to the grease trap must be fitted to the concrete bund wall in case of the tank rupturing.	RE/ECO	During site establishment.	
▪ A designated working area must be constructed and must be underlain by an impermeable surface (e.g. a concrete slab or plastic lining).	ECO	During site establishment.	
▪ All handling of potentially toxic or hazardous material, and the repair, maintenance and storage of vehicles and equipment must be undertaken on the impermeable working surface in accordance with the Materials Safety Data Sheets (MSDS).	RE/ECO	Ongoing.	
▪ Fire prevention facilities must be present and easily accessible at all storage facilities.	ECO	During site establishment.	
Fencing	**Monitor**	**Frequency**	**✓ / ×**
▪ The Contractors camp must be adequately fenced with bonnox type fencing (approximately 2m high, topped with razor wire) to discourage the theft of materials and equipment from the construction site.	RE	During site establishment.	
Risks Associated with Materials on Site	**Monitor**	**Frequency**	**✓ / ×**
▪ Material stockpiles must be stable and well secured to avoid collapse and possible injury to workers / residents.	RE	Ongoing.	
▪ Flammable materials should be stored as far as possible from adjacent residential / commercial areas.	RE/ECO	During site establishment.	
▪ Fire fighting equipment is to be present on site at all times in	RE/ECO	During site	

accordance with the Occupational Health and Safety Act (85 of 1993).		establishment.	
■ Obstruction to drivers' line of site as a result of stockpiles must be avoided, especially at intersections and on corners.	ECO	Ongoing.	
■ Residents, tenants and land owners adjacent to the site are to be notified in advance of any known potential risks with the construction site and associated activities.	RE	Ongoing.	
Hazardous Substances and Materials	**Monitor**	**Frequency**	**✓ / ×**
■ Material Safety Data Sheets (MSDS's) shall be readily available on site for all chemicals / hazardous substances to be used on site. Where possible and available MSDS's should include additional information on ecological impacts and measures to minimise and mitigate against any negative environmental impacts in the result of an accidental spill.	RE	Before construction commences.	
■ Hazardous storage and refuelling areas must be bunded with an impermeable liner to protect water quality. The Contractor shall submit a methods statement to the RE for approval.	RE/ECO	During site establishment.	
■ Storage areas containing hazardous substances / materials must be clearly sign posted.	ECO	During site establishment.	
■ Residents living adjacent to the Contractors Camp must be notified of the existence of the hazardous substances / materials storage area.	ECO	When moving onto site or when the relevant materials arrive on site.	
■ Staff handling hazardous substances / materials must be aware of their potential impacts and follow appropriate safety measures.	ECO	During staff induction / Ongoing.	
■ The Contractor must submit a method statement and plans for the storage of hazardous materials and emergency procedures.	ECO	Prior to establishment of storage area.	
Materials Management	**Monitor**	**Frequency**	**✓ / ×**
■ Contractors shall prepare a source statement indicating the sources of all materials (including topsoil, sands, natural gravels, crushed stone etc.) and submit these to the RE for approval prior to the commencement of any work.	RE/ECO	On award of contract.	
■ A signed document from the supplier of natural materials must be obtained confirming that they have been obtained in a sustainable manner and in compliance with relevant legislation.	ECO	On receipt of natural materials.	
Environmental Education and Awareness	**Monitor**	**Frequency**	**✓ / ×**
Ensure that all site personnel have a basic level of environmental awareness training. The Contractor must submit a proposal for this training to the ECO for approval. Topics covered should include: – What is meant by "environment"; – Why the environment needs to be protected and conserved;	ECO	During staff induction / Ongoing.	

– How construction activities can impact on the environment; – What can be done to mitigate against such impacts; – Awareness of emergency spills response provisions; and – Social responsibility during construction (being considerate to residents etc.). It is the Contractors' responsibility to provide the site foreman with no less than 1 hour's environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff.	ECO	Prior to moving onto site.	
■ Translators are to be used if necessary, to ensure that all staff understand what is required of them in terms of the EMP.	ECO	Ongoing.	
■ The RE / ECO must be on hand to explain any technical issues and to answer questions.	ECO	Ongoing.	
■ Use should be made of environmental awareness posters on site.	ECO	Ongoing.	
■ The need for a 'clean site' policy needs to be explained to everyone working on site.	ECO	During staff induction, followed by ongoing monitoring.	
Worker Conduct on Site	**Monitor**	**Frequency**	**✓ / ✗**
A general regard for the social and ecological well being of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following rules: ■ No alcohol / drugs to be allowed on site. ■ No firearms allowed on site or in vehicles transporting staff to / from the site. ■ Prevent excessive noise. ■ No harvesting of firewood from the site or from areas adjacent to it. ■ Construction staff are to make use of the facilities provided for them, as apposed to *ad hoc* alternatives. ■ Trespassing on private / commercial properties adjoining the site is forbidden. ■ Driving under the influence of alcohol is prohibited.	ECO	During staff induction, followed by ongoing monitoring.	
Dust / Air Pollution	**Monitor**	**Frequency**	**✓ / ✗**
■ Areas that have been stripped of vegetation must be dampened periodically to avoid excessive dust.	ECO	Ongoing.	
■ The Contractor must make alternative arrangements (other than fires) for cooking and / or heating requirements. LPG cookers may be used, provided that all safety regulations are followed.	RE	Ongoing.	

Soil Erosion	Monitor	Frequency	✓ / ✗
▪ Where possible the time that stripped areas are left exposed should be kept to a minimum.	RE/ECO	Throughout the project duration.	
▪ Wind screening and stormwater control must be undertaken to prevent soil loss from the site.	RE/ECO	During site establishment.	
Stormwater Management	**Monitor**	**Frequency**	**✓ / ✗**
▪ To prevent stormwater damage, the increase in surface runoff as a result of construction activities needs to be calculated and an appropriately designed stormwater management system needs to be put in place. A drainage plan must be submitted to the RE for approval.	RE	During surveys and preliminary site investigations.	
▪ Temporary cut off drains and berms may be required to capture stormwater and promote infiltration.	ECO	During site establishment.	
Fauna and Flora	**Monitor**	**Frequency**	**✓ / ✗**
▪ Vegetation not to be removed must be clearly marked beforehand with chevron tape. The ECO must be given time to identify vegetation that is not to be removed before the contractor begins clearing the site.	RE/ECO	During site establishment followed by ongoing monitoring.	
▪ Care must be taken to avoid the introduction of invasive plant species to the site and surrounding areas.	ECO	Ongoing.	
▪ On site finalisation of road alignments is to be undertaken with input from the vegetation and wetland specialist involved in the Environmental Scoping Process. Ecologically valuable areas are to be avoided.	ECO	During surveys, preliminary site investigations and site establishment	
▪ Security fence will be erected prior to the construction phase of the project.	ECO	During site establishment	
▪ Security fences must not traverse sensitive features, particularly sensitive / ecologically valuable vegetation and wetlands, on the golf course.	ECO	During site establishment	
Social Impacts: Visual and Noise	**Monitor**	**Frequency**	**✓ / ✗**
Noise Impacts			
▪ Construction vehicles are to be well maintained and fitted with silencers prior to the construction.	ECO	Prior to moving onto site.	
▪ Equipment fitted with noise reduction facilities will be used as per operating instructions and maintained properly during operations.	ECO	Ongoing.	
Visual Impacts			
▪ Storage facilities, elevated tanks and other temporary structures on site should be located in such a way that they have as little visual impact on local residents and businesses as possible.	RE/ECO	During surveys, preliminary site investigations and site establishment.	
▪ Special attention should be given to the screening of highly reflective materials on site.	ECO	During site establishment.	

Security ■ A security fence will be erected prior to construction to ensure the safety of residents abutting the golf course.	ECO	During site establishment.	
General	**Monitor**	**Frequency**	**✓ / ×**
■ Section 30 of NEMA makes provision that anyone who causes pollution or degradation of the environment is responsible for preventing impacts occurring, continuing or recurring and for the costs of repair of the environment.			
■ An earthen berm must be constructed along the upslope perimeter of the Contractor's Camp, to divert excess surface runoff away from potentially contaminated surfaces within the Contractors' Camp.	RE/ECO	During site establishment.	
■ An earthen berm must also be constructed along the down slope perimeter of the Contractor's Camp, to contain any contaminated runoff.	RE/ECO	During site establishment.	
■ The subsoil stripped from the camp can be used for creating the berm.	RE/ECO	During site establishment.	
■ All wastewater and contaminated runoff from the storage and working areas of the Contractor's Camp must be channelled into an appropriately sized, designed and located collection sump.	ECO	During site establishment.	
■ The sump must be adequately sized (capable of containing a storm event), properly managed and pumped out regularly to prevent overflows.	RE/ECO		
■ Contaminated liquids and sediments from the sump must be disposed of at an appropriate permitted disposal site.	ECO	Ongoing.	

Additional Notes:

4.2 MANAGEMENT OF CONSTRUCTION ACTIVITIES AND WORKFORCE

Most environmental impacts of developments occur in the construction phase of the project. As a result the regulation of construction activities and the general conduct of the workforce is an essential component of this EMP and must be carried out in conjunction with the ECO.

Management of Construction Activities and Workforce			
Site Access	**Monitor**	**Frequency**	**✓ / ×**
■ The Contractor is to ensure that all access roads are maintained in good working condition by attending to potholes, corrugations and storm water damage as soon as these develop.	RE	Weekly and after heavy rains.	
■ If necessary staff must be employed to clean surfaced roads adjacent to construction sites where materials have been spilt.	ECO	When necessary.	
Maintenance of the Contractors Camp Surfaces	**Monitor**	**Frequency**	**✓ / ×**
■ Contractor must monitor and manage site drainage to avoid standing water and soil erosion.	RE	Ongoing.	
■ Run-off from the Contractors Camp must not discharge into adjacent properties.	RE	Ongoing.	
Waste Management	**Monitor**	**Frequency**	**✓ / ×**
General			
■ The Contractor must identify disposal sites for the various categories of waste likely to be generated on site and must provide the ECO with documented proof of the type and volume of waste disposed of at these sites.	ECO	Weekly.	
■ The general cleanliness of the site and compliance with the waste disposal requirements outlined will form part of the site inspections undertaken by the ECO.	ECO	Ongoing.	
■ Where possible, waste containers must be collected for recycling programmes provided that the original contents of the containers were not hazardous.	ECO	Ongoing.	
Domestic Waste			
■ The working areas and the Contractor's Camp are to be cleared of litter on a daily basis.	RE	Ongoing.	
■ Domestic waste is to be stored in watertight, scavenger-proof and wind proof waste receptacles at the camp.	ECO	During site establishment.	
■ Domestic waste is to be cleared on a regular basis and transferred to a permitted domestic disposal site. No domestic waste is to be buried or burned on site.	RE	Ongoing.	
Scrap Metal and Hazardous Substance Containers			
■ Scrap metal (components, sheet metal, nails, tins) must be stored in a designated scrap metal container (e.g. a skip)	ECO	Ongoing.	

located at the Contractor's Camp.			
▪ All scrap metal is to be collected on the completion of a days work and transferred to the container.	RE	Daily.	
▪ When the scrap metal container is full, the scrap metal must either be collected by a scrap metal dealer or transferred to an appropriate disposal site.	ECO	Ongoing.	
▪ Hazardous substance containers, contaminated substrates and materials used in the clean-up of spillages must be stored in a designated, impermeable container (e.g. a skip) located at the Contractor's Camp if it is not possible to remove them from the site immediately.	RE/ECO	When necessary.	
▪ The hazardous substance containers, contaminated soil, clean-up materials, etc. must be transferred to an appropriate disposal site on a regular basis.	ECO	Ongoing.	
Construction Debris			
▪ On completion of construction, all leftover construction materials are to be removed from the working area and Contractor's Camp (sand, gravel, cement, cement bags, timber).	RE/ECO	On completion of project.	
▪ The materials must be disposed of at an appropriate site, sold / donated to the local inhabitants or taken to the Contractor's depot.	RE/ECO	On completion of project.	
▪ Construction debris is **not** to be buried on site.	RE/ECO	Ongoing.	
Ablution Facilities	**Monitor**	**Frequency**	**✓ / ×**
▪ An adequate number of self-contained chemical toilets must be established at the Contractor's Camp and active working area. Contractors must supply toilet paper at all toilets, and will be responsible for their maintenance and servicing.	RE	During site establishment / Daily.	
▪ The ablution facilities should conform to any requirements stipulated by the Department of Health and the Local Authorities.	RE	Prior to moving onto site.	
▪ Toilets must be placed outside areas susceptible to standing or flowing water and siting must be done in consultation with the ECO.	RE/ECO	During site establishment.	
▪ The ablution facilities must be maintained in a clean and orderly state and are to be regularly cleared to prevent odour and pest problems.	ECO	Weekly.	
▪ Contractors must ensure that no spillage occurs when chemical toilets are cleaned and cleared and that the contents is carefully stored and transported when removing off-site. All spills must be recorded in the Environmental Incident Record Book.	RE	When necessary.	
▪ **No** pit latrines are to be used.	RE/ECO	During site establishment.	

▪ Performing ablutions outside toilet facilities is **prohibited**.	ECO	Weekly.	
Provision of Water	**Monitor**	**Frequency**	**✓ / ×**
▪ Potable water is to be sourced from an existing supply, and made available at various localities around the Contractor's Camp.	RE	During site establishment / Ongoing.	
▪ A dedicated source of water for dust suppression purposes must be determined during site establishment and be approved by the ECO.	RE/ECO	During site establishment.	
Concrete Mixing	**Monitor**	**Frequency**	**✓ / ×**
▪ If small volumes of concrete are to be mixed (manually), mixing is to be undertaken on a hard surface covered in plastic sheeting so that concrete waste and runoff can be contained.	ECO	Ongoing.	
▪ If large volumes are generated the following requirements must be met: – Mixing area must be underlain by an impermeable surface that is sufficient to trap spills; – Runoff from the concrete mixing area is to be contained and channelled into a sump. – All concrete waste is to be collected and removed from the site for disposal at an appropriate disposal site.	ECO	Ongoing.	
Fauna and Flora	**Monitor**	**Frequency**	**✓ / ×**
▪ The following requirements must be met to ensure the protection of the vegetation: – Where possible, indigenous trees on site are to be protected. – All staff members are required to attend the environmental awareness meeting; – Employees are subject to fines, should they be caught removing flora from the site or immediate surrounds. – No member of the construction team may harvest, damage or remove plants, especially those in designated 'out of bounds' areas. – Use only plant species endemic to the site for rehabilitation purposes. – Revegetate the disturbed area as quickly as possible.	ECO	During staff induction / Ongoing.	
Wetlands	**Monitor**	**Frequency**	**✓ / ×**
▪ Fences are to follow routes of least sensitivity and are to be designed to ensure minimal impact on habitat.	ECO	Prior to construction	
▪ Pipeline routes are to be clearly demarcated prior to them being laid and assessed by the Environmental Control Officer (ECO) to ensure that they follow the route of least impact and do not impact on the subsurface flow of wetlands.	ECO	Prior to construction	

▪ The construction of roads over wetlands, riverine areas and drainage lines should be avoided.	ECO	Prior to construction	
▪ If construction of roads over wetlands cannot be avoided then culverts and / or gabions should be constructed under the roads to maintain the natural flows of streams and seepage areas.	ECO	Prior to construction	
▪ The outflow points of these drains should be directed to natural drainage lines. A predominantly vegetated buffer area, at least 20m wide should be included between the stormwater outflow and the outer boundary of the wetland.	ECO	Prior to construction	
▪ The digging of trenches to drain wetlands during construction must be avoided.	ECO	Prior to construction	
▪ A sufficient number of culverts and / or gabions are to be incorporated into road construction over wetlands in the vicinity of Prodigal Son. – Culverts are to be placed at regular intervals to reduce the draining of the wetland immediately downstream of the road – Culvert density should increase as one moves towards the thalweg	ECO	Prior to construction	
Removal of Vegetation	**Monitor**	**Frequency**	**✓ / ×**
▪ Site clearing activities should only be conducted immediately prior to construction, to reduce the amount of time topsoil is exposed, and thus the potential for erosion. ▪ In areas where vegetation is to be disturbed, disturbance is to be minimised through the careful placement of houses in consultation with a specialist ecologist.	ECO ECO	Ongoing. Ongoing.	
▪ Chevron tape is to be placed around individual plants species identified as being rare and / or valuable and homes are to be designed taking these plants into consideration.	ECO	During surveys, preliminary site investigations and site establishment.	
Weed Control	**Monitor**	**Frequency**	**✓ / ×**
▪ The Contractor is to control and eradicate the spread of alien weeds during the project. The ECO will provide the Contractor with the most appropriate, species-specific methods for eradicating problem plants. ▪ Alien plants that have been removed are not to be discarded but are to be collected and transferred to the Contractor's Camp where they can be burned in a controlled manner.	ECO ECO	Ongoing. When required.	
Water Quality	**Monitor**	**Frequency**	**✓ / ×**
▪ The Contractor is to control and minimise the washing of soil into watercourses by implementing the following: – Appropriate soil management strategies; – Prompt rehabilitation to protect and stabilise exposed soil	ECO	Weekly (Summer) / Monthly (Winter)	

surfaces. – Follow the requirements for soil stockpiling and management. ■ The Contractor is to prevent the contamination of water by materials used during construction and ensure the following: – Implement measures to prevent seepage of liquid materials into ground where it could contaminate groundwater; – Ensure prompt cleaning up of accidental spillages (Section 20 of the National Water Act (36 of 1998)). ■ The Contractor is to prevent the contamination of hydrological features by diesel, grease, oil, etc. derived from the camp and working area by ensuring that: – The machinery / equipment is maintained in a good operating condition; – Specially designated areas for vehicle maintenance are created; – Accidental spillages are cleaned up promptly and all contaminated material disposed appropriately.	ECO ECO	Weekly Weekly.	
Stormwater Management	**Monitor**	**Frequency**	**✓ / ×**
General Principles ■ Stormwater Management Plan should be implemented during the construction phase of the development to handle all stormwater run-off on site.	RE/ECO	Prior to construction	
■ There is to be a periodic inspection of the sites drainage system to ensure that the flow of surface water is not obstructed. ■ The use of high velocity stormwater pipelines is to be avoided and where possible open, high friction, semi-permeable channels are to be used. ■ A number of smaller stormwater outfall points are to be constructed as apposed to a few large outfall points. ■ Stormwater outfalls are to be designed to reduce flow velocity and avoid stream bank and soil erosion. ***Unchannelled Flow*** ■ During construction, unconfined surface flow must be contained to avoid soil erosion.	RE/ECO RE/ECO RE RE/ECO	Monthly. As directed by the RE. As directed by the RE. As directed by the RE. As surfaces become exposed.	
Soil Erosion	**Monitor**	**Frequency**	**✓ / ×**
■ Once the site has been cleared of vegetation, the top layer of soil (150mm) should be removed and stockpiled in a designated area. ■ The entire site must not be cleared of vegetation before construction commences, ensuring that exposed areas are	ECO RE/ECO	Ongoing. Ongoing.	

kept to a minimum, wherever possible.			
▪ Topsoiling and revegetation shall commence immediately after the completion of an activity.	ECO	On completion of each phase.	
▪ Stormwater management and wind screening must be undertaken to prevent soil loss from the site.	RE	Ongoing.	
▪ Side tipping of spoil and excavated materials shall not be permitted – all spoil material shall be deposited of as directed by the RE.	RE	Ongoing.	
▪ Battering of all banks shall be such that cut and fill embankments are no steeper than the previous natural slopes unless otherwise permitted by the RE. Cut and fill embankments steeper than the original ground levels are to be revegetated immediately on completion of trimming. Alternatively cut and fill embankments are to be protected against erosion using bioengineering stabilisation measures.	RE/ECO	As cut and fill activities are completed.	
▪ All embankments, unless otherwise directed by the RE shall be protected by a cut off drain to control surface flow and prevent erosion.	RE	Immediately after the creation of the embankment.	
Soil Handling	**Monitor**	**Frequency**	**✓ / ×**
▪ Soil must not be handled when it is wet as this will result in unnecessary compaction.	RE	When necessary.	
▪ Repeated handling of soil must be avoided as this results in compaction and the loss of soil structure. Planning the soil stripping and stockpiling process and allocating formal stockpile areas to reduce repeated handling.	RE/ECO	Ongoing.	
▪ If the soil stockpiles are to remain unused for more than two months they need to be vegetated with a suitable grass / legume mix.	ECO	When necessary.	
▪ In order to minimise the risk of spillage and loss through wind erosion, trucks transporting soil must not be overloaded when conveying soil to and from the site.	RE	Ongoing.	
▪ Soils being transported long distances must be covered with a tarpaulin.	RE	Ongoing.	
Stockpile Management	**Monitor**	**Frequency**	**✓ / ×**
General Guidelines			
▪ Stripped soil is to be stockpiled so that it can be used in the rehabilitation process.	RE/ECO	Ongoing.	
▪ Soil that is to be stockpiled for an extended period must be stored at:	ECO	When necessary.	
▪ A sheltered site where it will not be exposed to the effects of wind erosion;			
– Outside the working area where it will not be disturbed or contaminated;			
– Away from drainage lines so as to avoid the risk of			

erosion; – Topsoil (top 200 mm) is not to be mixed with subsoil.	ECO	When necessary.	
■ Soil is not to be stockpiled against tree trunks as this will encourage ant infestations.	ECO	Locate as directed by the RE.	
■ Topsoil is not to be used as a bedding material.	ECO	When necessary.	
Location of Soil Stockpiles			
■ Stockpiles must not be situated such that they obstruct natural waterways and drainage lines.	RE/ECO	Locate as directed by the RE.	
■ Soil is to be stockpiled in small manageable piles (Not to exceed 2m).	RE	Ongoing.	
Stockpile Maintenance			
■ Stockpiles are to be protected from wind and water erosion: – Short-term stockpiling (less than 3 weeks) erosion control measures will not need to be implemented; however, limitations on the area to be cleared will apply. – Medium-term stockpiling (more than 3 weeks), stockpiles must be covered with biomatting. – Long-term stockpiling (more than 2 months), stockpiles must be revegetated by hydroseeding or sowing with an appropriate grass / legume mix.	ECO	Weekly.	
■ The colonisation of stockpiles by invasive plants must be controlled by removing the plants when they germinate. The purpose of this is to reduce the risk of developing a seedbank of invasive species within the stockpiled soil.	ECO	Monthly.	
Spoil Use, Handling and Disposal	**Monitor**	**Frequency**	**✓ / ×**
■ Excess material must first be used for: – Creation of rock gabions where required for slope protection and erosion control; – Rehabilitation of cuts; – Backfill for excavations.	RE/ECO	Ongoing.	
■ Should the volume of spoil to be disposed of be too large or if the density of spoil stockpiles becomes too high, the spoil will have to be removed from the working area to an appropriate area.	RE	When necessary.	
Dust / Air Pollution	**Monitor**	**Frequency**	**✓ / ×**
■ Exposed surfaces must be revegetated as soon as possible.	RE/ECO	Ongoing.	
■ Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present.	RE	Ongoing.	
■ Soils must either be covered with a biomatting or revegetated, and stockpiles are to be located in sheltered areas where they will not be exposed to the erosive effects of the wind.	RE	Ongoing.	

▪ Appropriate dust suppression measures must be used when dust generation is unavoidable (dampening).	RE	Ongoing.	
▪ No fires are allowed on site, except for the burning of fire breaks and alien species.	RE	Ongoing.	
▪ Vehicles and machinery are to be kept in good working order and to meet manufacturers specifications for safety, fuel consumption etc.	ECO	Ongoing.	
▪ Should excessive emissions be observed, the Contractor is to have the equipment seen to as soon as possible.	RE	As directed by the RE.	
Hazardous Substances	**Monitor**	**Frequency**	**✓ / ✗**
The handling and storage of hazardous materials must be in accordance with the MSDS and must be restricted to the Contractor's Camp as the appropriate pollution control measures will need to be in place. If additional areas / sites are required for the storage or handling of hazardous substances, they must be assessed and approved by the ECO who will then instruct the Contractor to implement the appropriate controls.	RE/ECO	Before construction commences / As additional hazardous are required.	
Inventory of Substances			
▪ The Contractor must compile an inventory of all fuels and hazardous substances to be used and stored on the site, and must ensure that they know the effects of these substances on their staff and the environment. A copy of this inventory must be supplied to the RE and ECO.	RE/ECO	Before construction commences / As additional hazardous are required.	
Handling and Storage			
▪ The Contractor must ensure that the quantities of fuels and chemicals stored on site are appropriate for his / her requirements, and must also ensure that they are appropriately stored and handled so as to minimise the risk of spills.	ECO	Ongoing.	
▪ All fuels and chemicals must be confined to specific and secured areas that have to be approved by the ECO.	ECO	During site establishment / Ongoing.	
▪ Chemicals must be stored in a bunded area with an impermeable base (e.g. concrete or plastic lining), which is capable of containing 110% of the bunded material.	ECO	Ongoing.	
Spills of Hazardous Substances			
▪ The accidental or negligent spillage of any fuels or potentially hazardous substances must be cleaned up immediately using the most appropriate methodologies, equipment and materials.	RE	When necessary.	
▪ The Contractor must ensure that the necessary materials, equipment and chemicals are available on the site to deal with spills of any of the hazardous materials present (e.g. Drizit).	RE/ECO	During site establishment.	
▪ The Contractor must devise a procedure for dealing with accidental spills, which has to be approved by the ECO. The procedure must distinguish between those spills that can be cleaned up by the Contractor and those that will require specialist input. The name and contact numbers of various	ECO	Prior to moving onto site.	

clean up companies must be posted and visible at the camp office. This procedure must also include a provision to notify the Resident Engineer and ECO of any spills.			
▪ Any contaminated soil or water must be removed and stored in a skip until it can be disposed of at an appropriate disposal site.	ECO	When necessary.	
Recording of Incidents			
The Contractor must provide an Environmental Incident Record Book on site to record the details of any environmental incidents (date, time, cause, action taken). This book will be regularly checked by the ECO who will also cross reference the entries with observations made during site visits.	ECO	Prior to moving onto site / Ongoing.	
Contaminated Water and Soils	**Monitor**	**Frequency**	**✓ / ×**
▪ All soil that is contaminated must be removed and stored in a skip until it can be disposed of at an appropriate disposal site.	ECO	Ongoing.	
▪ All wastewater and polluted runoff from contaminated areas must be channelled into an appropriately sized, designed and located collection sump.	RE/ECO	During site establishment / Ongoing.	
▪ The size, design and location of the polluted runoff capture system must be assessed and approved by the ECO.	ECO	During site establishment.	
▪ The collection sumps must be properly managed and regularly cleared to prevent overflows.	ECO	Ongoing.	
▪ Contaminated water / sediment from the sumps must be disposed of at an appropriate disposal site.	RE/ECO	Ongoing.	
Fuel Tanks	**Monitor**	**Frequency**	**✓ / ×**
▪ All liquid fuels (e.g. diesel and petrol) which are stored in tanks or drums must have a bund wall around the tanks to prevent liquids from escaping in the event of a spill or leak.	RE	During site establishment.	
▪ The volume of the bund must be 110% of the volume of the storage tanks.	RE	During site establishment.	
▪ The fuels dispenser must be hung within the bunded area while not in use.	ECO	Ongoing.	
▪ Fuel tank(s) must be located in an area, which is easily accessible for vehicles.	RE/ECO	During site establishment.	
▪ The Contractor will be responsible for ensuring that any party delivering fuels or other chemicals to the site is aware of the appropriate storage / drop-off locations and the environmental controls that apply.	RE	When necessary.	
Equipment / Machinery	**Monitor**	**Frequency**	**✓ / ×**
▪ The Contractor must store all equipment that may leak on an impermeable surface, with watertight drip trays to catch any pollutants.	ECO	Ongoing.	
▪ The drip trays must be cleaned regularly, and must not be allowed to overflow.	RE/ECO	Ongoing.	

■ Chemicals collected in the drip trays must be collected and disposed of in an appropriate manner (MSDS).	RE/ECO	Ongoing.	
Personal Safety	**Monitor**	**Frequency**	**✓ / ✗**
Hard Hats ■ The following personnel are required to wear hard hats: – All persons within 10m of any situation where any form of lifting or hoisting equipment is being undertaken; – Any personnel working in any other situation where possibility of head injury is present.	RE/ECO	Ongoing.	
Protective Gloves ■ Protective gloves are to be worn by all persons engaging in the following: – Handling of heavy or sharp edged materials; – Welding or gas cutting activities; – Handling of corrosive chemicals.	RE/ECO	Ongoing.	
Safety Footwear ■ All persons entering the workshop area and active working area must wear approved safety boots.	RE/ECO	Ongoing.	
Safety Goggles ■ The following persons must wear safety goggles at all times: – Persons operating equipment under dusty conditions; – Persons engaged in cutting or welding activities; – Persons engaged in grinding activities; – Persons handling hazardous chemicals.	RE/ECO	Ongoing.	
Socio-Economic Environment			
Disruption of Infrastructure and Services			
■ Should the construction staff be approached by members of the public or other stakeholders they are to assist them in locating the RE or Contractor.	RE	Ongoing.	
■ The Contractor is to inform surrounding residents and businesses in writing of disruptive activities at least 24 hours in advance. This can either take place by way of leaflets placed in post boxes giving the RE and Contractors contact details or any other method approved by the RE.	RE/ECO	At least 24 hours before the activity is to take place.	
Visual Impacts			
■ The site is to be kept clean at all times to minimise the visual impacts of the site.	ECO	Weekly.	
■ Lighting of the Contractors Camp should be pointed downwards and away from oncoming traffic and surrounding properties to minimise the visual intrusion.	ECO	During site establishment.	

Noise	Monitor	Frequency	✓ / ✗
▪ Disturbance of the residents / businesses in the vicinity of the construction areas will have to be taken into account during the construction period.	RE	Ongoing.	
▪ The siting of areas for delivery of equipment and materials must take into account the noise generated by vehicles as well as noise generated by off-loading equipment.	RE	During site establishment.	
▪ Jackhammers and their associated compressors exhibit continuous noise that could impact on nearby residents. Acoustic treatment of the jackhammers must include silencers.	RE	Prior to moving onto site / Ongoing.	
▪ All vehicles and equipment must be properly maintained to reduce unnecessary noise.	RE	Ongoing.	
▪ Noisy activities are to be restricted to the times given in the project specifications or general conditions of the contract.			
Staff Conduct	**Monitor**	**Frequency**	**✓ / ✗**
▪ The Contractor must monitor the performance of construction workers to ensure that the points relayed during their induction have been properly understood and are being followed. If necessary the ECO and / or a translator is to be called onto site to further explain aspects of environmental or social behaviour that are unclear.	RE/ECO	Ongoing.	
Damage to Property and Structures	**Monitor**	**Frequency**	**✓ / ✗**
▪ Damage to structures and fences on private property must be avoided as far as possible.	RE	Ongoing.	
▪ Should damage to the aforementioned occur, the Contractor will be responsible for repairing the damage caused or compensating the property owner accordingly.	RE	Ongoing.	
▪ Any fencing removed to enable construction to proceed must be replaced on completion of work in that area.	RE	Ongoing.	
Communication with I&AP's	**Monitor**	**Frequency**	**✓ / ✗**
▪ The RE and Contractor are responsible for ongoing communication with all I&AP's.	RE/ECO		
▪ A complaints register is to be located at the site office. The Contractor must account for any missing pages. This register is to be tabled during monthly site meetings.	ECO	Monthly.	
▪ I&AP's need to be made aware of the existence of the complaints register and the methods of communication available to them.	RE/ECO	Ongoing.	
▪ Queries and complaints are to be handled by: – Documenting details of such communications; – Submitting these for inclusion into the complaints register; – Brining issues to the immediate attention of the RE; and – Taking remedial action as per the RE and / or ECO's	ECO	Ongoing.	

instructions. ■ Selected staff are to be made available for formal consultation with I&AP's in order to: – Explain the construction process; and – To answer any questions.	ECO	Ongoing.	

Additional Notes:

4.3 POST CONSTRUCTION ACTIVITIES

Site rehabilitation is an essential component of this EMP and must be carried out in conjunction with the ECO. The guideline is to be used as the basic structure for the site rehabilitation; the specific details must be decided by the Rehabilitation Contractor in conjunction with the ECO. This applies most specifically to the soil replacement and revegetation components which should also contain input from vegetation and wetland specialists involved during the scoping phase.

- The requirements for the control of soil, water, dust and noise pollution stipulated in this EMP still applies during the site rehabilitation phase of the project.
- Similarly, the requirements for soil management, erosion control, alien vegetation removal and vegetation and fauna protection also apply.

Post Construction			
Infrastructure	**Monitor**	**Frequency**	**✓ / x**
■ Disassemble all infrastructure units and remove components from the working areas and Contractors Camp. This will include temporary office and storage structures and containers, water supply pipelines, water storage containers, power supply, etc.	RE	On completion of the project.	
■ Drain all portable chemical toilets, being careful not to spill	RE	On completion of	

the contents. Transfer the contents to an appropriate disposal site.		the project.	
■ Drain all wastewater and sewage associated with the temporary ablution facilities and transfer the waste to an appropriate disposal site.	RE	On completion of the project.	
■ Disassemble all fencing around the camp and either sell, auction or donate the components to the local community or transfer the waste components to a disposal site or the Contractors base.	RE	On completion of the project.	
Pollution Control Structures	**Monitor**	**Frequency**	**✓ / ×**
■ Excavate all areas of contaminated substrate, transfer the contaminated substrate to an appropriate disposal site and treat the affected areas with appropriate ameliorants.	RE	On completion of the project.	
■ Remove all plastic linings used for pollution control and transfer to an appropriate disposal site.	RE	On completion of the project.	
■ Break up all concrete structures that have been created (e.g. working and parking surfaces) and remove concrete waste to an appropriate disposal site.	RE	On completion of the project.	
Waste	**Monitor**	**Frequency**	**✓ / ×**
■ Remove all leftover construction materials from the Contractors Camp and working areas and either sell, auction, donate to the local community or transfer to the Contractor's base.	RE	On completion of the project.	
■ Remove all construction debris, litter and domestic waste from the Contractors Camp and working areas and transfer to an appropriate disposal site. Remove all waste receptacles from the camp and working area and either donate to the local community, auction, or transfer to Contractor's base.	RE	On completion of the project.	
■ Do not burn or bury any waste at the Contractors Camp or in the working area – all waste is to be transferred to a permitted disposal site.	RE/ECO	On completion of the project.	
Collection Sumps	**Monitor**	**Frequency**	**✓ / ×**
■ Drain all collection sumps and dispose of the contaminated liquid and solids at an appropriate disposal site.	RE/ECO	On completion of the project.	
■ Remove the tanks or plastic linings or similar and transfer to a permitted site for disposal.	RE/ECO	On completion of the project.	
Revegetation	**Monitor**	**Frequency**	**✓ / ×**
■ The use of vegetative screening and natural colours must be employed to reduce the visual impact for neighbouring landowners as far as possible.	ECO	During landscaping phase.	
■ It is important that the revegetation activities be planned in advance to ensure that seed and plant stockists are able to supply the required volume when required.	RE	On completion of the project.	
■ Only indigenous and preferably endemic plant species will	ECO	During landscaping	

be permitted in the gardens. ▪ All revegetated areas will need to be watered to ensure plant growth and development. The volume and frequency of watering will be left to the discretion of the Rehabilitation Contractor and ECO.	RE/ECO	phase. As per the instructions of the ECO.	
Operational Activities	**Monitor**	**Frequency**	**✓ / ✗**
▪ Wetlands – Wetlands are to be demarcated and sign posted to notify residents and golfers of their location and extremities. – Golfers and residents should be prohibited from entering wetlands. – Wetland unit M is to be rehabilitated and incorporated into the golf course layout.	Homeowners Association	Ongoing.	
▪ Vegetation – An extensive alien plant eradication programme needs to be implemented. – Alien plant eradication programme should apply species specific eradication methods. – Alien plant abundance is to be monitored to assess the success of implementation programme.	Homeowners Association	Ongoing.	
▪ Waste Management: – Sites are to be kept clean, neat and free from litter at all times. – Where possible, plastics, paper, glass and cans should be separated from other domestic waste for recycling. If waste is to be recycled, appropriately labelled waste receptacles should be made available.	Homeowners Association	Ongoing.	
▪ Hazardous Materials: – All hazardous materials are to be stored on impermeable surfaces. – No chemicals are to be discharged to sewer.	Homeowners Association	Ongoing.	
▪ Visual And Aesthetic: – Suitable fast growing trees should be planted around each site to screen the houses from the surrounding properties and each other.	Homeowners Association	Ongoing.	
▪ Noise Management: – Ensure that routine maintenance is conducted during normal business hours. – No loud music is to be permitted at all times.	Homeowners Association	Ongoing.	
▪ General Behaviour: – No motorbikes (including three-wheelers and quad	Homeowners Association	Ongoing.	

bikes) are to be allowed on the site. – No off-road driving. – No domestic cats are allowed within the Mzingazi Golf Estate – No domestic animals will be allowed on the property. – No trespassing on adjacent properties. – No hunting or shooting.			

Additional Notes:

5 Conclusion

In terms or NEMA everyone is required to take reasonable measures to ensure that they do not pollute the environment. Reasonable measures include informing and educating employees about the environmental risks of their work and training them to operate in an environmentally responsible manner. Furthermore, in terms of NEMA, the cost to repair any environmental damage shall be borne by the person responsible for the damage.

If the above-mentioned management recommendations are adopted it is anticipated that most of the negative environmental impacts of construction can be mitigated against. An appointed ECO will need to monitor the site throughout construction to ensure that the required environmental controls are in place and working effectively.