

# **ENVIRONMENTAL MANAGEMENT PLAN**

**(EMP)**

for the

management of activities relating to the protection of the natural environment during the construction-  
and maintenance phases relating to the proposed

# **BIOREMEDIATION SITE**

## **FOR BLACK MOUNTAIN MINING**

**Farm Aggeneys 56/1, Aggeneys Northern Cape**

**MARCH 2018**

Compiled by: *EnviroAfrica cc*

# 1 Introduction

The main purpose of this Environmental Management Plan or Programme (EMP) is to prevent avoidable damage and/or minimise or mitigate unavoidable environmental damage associated with any construction, maintenance, or demolition work where there is a risk of environmental damage and to enhance positive benefits of the project.

It should be noted that this EMP should be read in conjunction with the Methodstatement (Attached as **Addendum A of this EMP and Appendix G of the BAR**). This Methodstatement was developed by the Eco-con, the contractor which conducted the pilot project and which is facilitating the process.

The EMP forms part of the contractual obligations to which all contractors/employees involved in construction, maintenance, or demolition work must be committed. It serves as a guideline and baseline information document for the construction and operational of the proposed project and aims to comply with Section 24N of the National Environmental Management Act (Act no 107 of 1998) also known as NEMA, as well as the Environmental Impact Assessment Regulations Notice No R 982 and any additional specific information requested by any State Department, including the Department of Environmental Affairs and Development Planning (D:EA&DP) for specific projects.

This EMP:

- identifies project activities that could cause environmental damage (risks) and provides a summary of actions required;
- identifies persons responsible for ensuring compliance with the EMP and provides their contact information;
- provides standard procedures to avoid and/or minimise the identified negative environmental impacts and to enhance the positive impact of the project on the environment;
- provides site and project specific rules and actions required, including a site plan/s showing:
  - areas where construction, maintenance, or demolition work may be carried out;
  - areas where any material or waste may be stored;
  - allowed access routes, parking and turning areas for construction or construction related vehicles;
- forms a written record of procedures, responsibilities, requirements and rules for Contractor/s, their staff and any other person who must comply with the EMP;
- provides a monitoring and auditing programme to track and record compliance and identify and respond to any potential or actual negative environmental impacts; and
- provides a monitoring programme to record any mitigation measures that are implemented;

The EMP is partly prescriptive (identifying specific people or organisations to undertake specific tasks, in order to ensure that impacts on the environment are minimised), but it is also an open-ended document in that information gained during the construction activities and/or monitoring of procedures on site could lead to changes in the EMP.

## 1.1. Terms of reference

EnviroAfrica (Pty) Ltd was appointed by Department of Agriculture, Land Reform & Rural Development, as the independent Environmental Assessment Practitioner (EAP) to draft the EMP. In terms of the special conditions of the contract (specifications) the EMP must include the following:

- Details of the EAP (Refer to Page ii of this document)

- Purpose of the EMP (Refer Par. 1.2)
- Legal requirements (Refer Par. 4 & 6.1)
- Management of possible impacts (Refer Par. 5-7)
- Institutional arrangements (Refer Par. 7.1)
- EMP operational & implementation procedures (Refer Par 5-9)
- Conclusion (Refer Par. 6)
- Annexures (Refer to Appendices)

## 1.2. Purpose of the EMP

The purpose of this Environmental Management Plan or Programme (EMP) is to give direction and guidance to all responsible parties, and binds all contractors, sub-contractors and other persons working on the site to adhere to the terms and conditions of the EMP during the construction and operational phase of the project. Any additional Site Specific conditions decided and agreed upon during the “On Site Start-Up Meeting” shall be included and will become a part of the EMP.

The overall aim of the EMP is to prevent avoidable damage and/or minimise or mitigate unavoidable environmental damage associated with the construction, and to a lesser degree the operational, phases of the proposed project.

The EMP forms part of the contractual obligations to which all contractors/employees involved in construction, maintenance, or demolition work must be committed. It serves as a guideline and baseline information document for the construction, operational and decommissioning phases of the proposed project and aims to comply with Section 24N of the National Environmental Management Act (Act no 107 of 1998) also known as NEMA, as well as the Environmental Impact Assessment (EIA) Regulations and any additional specific information requested by any State Department, including the Department of Environmental Affairs (DEA) for specific projects.

This EMP:

- identifies project activities that could cause environmental damage (risks) and provides a summary of actions required;
- identifies persons responsible for ensuring compliance with the EMP;
- provides standard procedures to avoid and/or minimise the identified negative environmental impacts and to enhance the positive impact of the project on the environment;
- provides site and project specific rules and actions required, through the start-up report;
- forms a written record of procedures, responsibilities, requirements and rules for Contractor(s), their staff and any other person who must comply with the EMP;
- provides for monitoring of compliance and record keeping.

The EMP is partly prescriptive (identifying specific people or organisations to undertake specific tasks, in order to ensure that impacts on the environment are minimised), but it is also an open-ended document in that information gained during the construction activities and/or monitoring of procedures on site could lead to changes in the EMP.

## 1.3. Scope

This EMP addresses the construction- and operational phases and all activities associated with this project. Compliance to the EMP shall be monitored by an independent Environmental Control Officer (ECO) who will visit the site on a regular basis during the construction phase (at least twice monthly).

The Client or the Construction Engineer or Project Manager, on behalf of the Client, will be responsible to ensure the implementation of the requirements of this EMP by all contractors and sub-contractors.

## 2. Project location and description:

Black Mountain Mine (BMM) is situated in Aggeneys, a small town in the Northern Cape Province. BMM is located 60km East of Pofadder and 110km West of Springbok. BMM is adjacent to the small town of Aggeneys located along the N14 highway between the towns of Pofadder and Springbok.



**Figure 1: Location of BMM in proximity to other towns**

Black Mountain Mining (BMM) wants to establish a bioremediation site to treat between 500 kg but less than 1 ton of hydrocarbon contaminated soil and cardboard boxes per day. Using biological agents, soil and cardboard contaminated by hydrocarbons are treated, breaking down the hydrocarbon rings. This will have a massive cost reduction since all contaminated soils and cardboard at present, is sent to Vissershok, a hazardous waste disposal site.

BMM has already started with a small pilot project in order to test the potential for such a remediation process. Eco-Con was appointed as the contractor to construct the pilot bioremediation treatment site and facilitate the process. The results have been very positive and BMM want to license this site to start treating all contaminated soils and cardboard on site.

The treatment methodology was taken from the method statement (Addendum A or Appendix G of the EIR) from the contractor, Eco-Con as well as liaison with the contractor via email. Hydrocarbon contaminated soil will be transported from the site identified and tipped within the designated demarcated area to undergo processing and final windrow formation. The site, approximately 630m<sup>2</sup>, consists of a 1000micron liner which is placed over berms and a hollowed area. The liner is thick and very durable and is used to prevent leaching of any contaminants into the soil below. However, in this process, leaching is very unlikely to occur, and if it does occur, it will carry bacteria to eliminate the effect.

The contaminated soil and carboard will be mixed with suitable organic matter. Following the introduction of the organic matter, the windrows will be turned and aerated regularly during the works with spades. At BMM aeration/ turning will done evert 14 days of every second month.

Natural occurring strains and forms of bacteria is used to digest petroleum hydrocarbon content of soil. For this facility a dry and wet application method is used to facilitate the bioremediation processes, due to Eco-con's low frequency visits.

The dry application method is called Supazorb, which is derived from a renewable source in Kwazulu-Natal. Pine needles' capulars contains the required bacteria. Organic matter like seedless compost may also be used in the event that soil density is too high. The organic matter that will be used can be described as pine needles and sometimes compost.

For the wet application method, a sprinkler system was installed to provide microbe enriched water to the contaminated soil. Microbe enriched water refers to used grey water transported from Kathu. The grey water is colonised prior to transportation to ensure sufficient amounts of aerobic bacteria colonies is available to digest contaminants and aerate the soil. Grey water is pumped from camp effluent tanks and treated, nitrated and phosphates serve as great growing catalysts. The sprinkler system is powered by a pump station with solar panels.

Bioremediated sand and boxes will then be used on site as rehabilitation sand on the mine.

Access to the proposed site will be via existing access routes. No civil or electrical services necessary. The sprinkler system is powered by a pump station with solar panels.



**Figure 2: Google image indicating the proposed Bioremediation within the recycling salvage yard, on Black Mountain Mining, Aggeneys**

### 3. Recommendations

The following are site specific recommendations, as per the various specialist assessments of the project. Please note that if there is any contradiction between the following specialists recommendations and/or the conditions of the Environmental Authorisation, and the recommendations in the sections below, the Environmental Authorisation and specialist recommendations take precedent.

#### 3.1 Botanical:

A biodiversity statement was conducted (**Appendix D of the EIR**). At the proposed bioremediation site, the loss of vegetation is negligible as the area is previously disturbed with no vegetation growth.

- Work should remain within the demarcated area chosen for the bioremediation site.
- Topsoil must be removed and stored separately for re-use for rehabilitation purposes. The topsoil and vegetation should be placed over the disturbed area to provide a source of seed bed to encourage re-growth of the species removed during construction/ operation.
- Once construction is completed, all further movement must be confined to the access tracks to allow vegetation to re-establish over excavated areas.
- The BMM ECO must oversee compliance to mitigation measures for this project

#### 3.2 Palaeontology

**A heritage impact assessment will still be conducted and these recommendations will be updated and included.**

- The responsible Environmental Control Officer (ECO) should monitor all substantial (> 1 m deep) excavations for fossil material.
- In the case of any significant fossil finds during construction (e.g. vertebrate teeth, bones, burrows, petrified wood, shells), these should be safeguarded - preferably in situ - and reported by the ECO as soon as possible to SAHRA (Contact details: Dr Ragna Redelstorff, SAHRA, P.O.Box 4637, Cape Town 8000. Tel: 021 202 8651. Email: rredelstorff@sahra.org.za, so that appropriate mitigation (i.e. recording, sampling or collection) by a palaeontological specialist can be considered and implemented. These recommendations should be incorporated into the Environmental Management Plan (EMP) for this borrow pit development.

#### 3.3 Archaeological

- If any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshells fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgit/ John Gible 021 462 5402) must be alerted. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Mimi Seetelo 012 320 8490), must be

alerted immediately. A professional archaeological or palaeontological significance, a Phase 2 rescue heritage operation may be required subject to permits issued by SAHRA.

## 4. Management Procedures

### 4.1 Functions and Responsibilities for the Construction Phase

Formal responsibilities are necessary to ensure that key procedures are executed. Specific responsibilities of BMM (The Applicant) with the implementing agent Project Manager and Environmental Control Officer for the construction phase of this project are as detailed below.

#### **The Applicant**

- Ensure that the Contractor(s) is aware of all specifications, legal constraints and standards and procedures pertaining to the project specifically with regards to the environment;
- Ensure that all stipulations within the EMP are communicated and adhered to by Department of Transport, Roads and Public Works (DTRPW) and its Contractor(s);
- Monitor the implementation of the EMP throughout the project by means of site inspections and meetings. This will be documented as part of the site meeting minutes;
- Be fully conversant with all relevant environmental legislation.

#### **The Project Manager will:**

- Be fully conversant with the Environmental Management Plan;
- Be fully conversant with all relevant environmental legislation and ensure compliance with these;
- Have overall responsibility for the implementation of the EMP;
- Conduct audits to ensure compliance to the EMP;
- Prevent actions that will harm or may cause harm to the environment, and take steps to prevent pollution on the site; and
- Confine activities to the demarcated construction site.

#### **The Environmental Control Officer (ECO) will:**

- Be fully conversant with the Environmental Management Plan;
- Be fully conversant with all relevant environmental legislation and ensure compliance with them;
- Convey the contents of this document to the Contractor site staff and discuss the contents in detail with the Project Manager and Contractor. Training will be required to ensure all staff understands the process;
- Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMP and Environmental Authorisation (or Record of Decision);
- Take appropriate action if the specifications contained in the EMP are not followed;
- Monitor and verify that environmental impacts are kept to a minimum, as far as possible;
- Review and approve construction methods (where it could result in environmental impacts), with input from the Project Manager, where necessary;
- Ensure that activities on site comply with all relevant environmental legislation;
- Order the removal from the construction site of any person(s) and/or equipment in contravention of the specifications of the EMP;
- Liaise with the Project Manager regarding the monitoring of the site; and
- Report any non-compliance or remedial measures that need to be applied to the appropriate authorities. (Martin, 2007)
- The responsible Environmental Control Officer (ECO) should monitor all substantial (> 1 m deep) excavations for fossil material. In the case of any significant fossil finds during construction (e.g. vertebrate teeth, bones, burrows, petrified wood, shells), these should be safeguarded - preferably in situ - and reported by the ECO as soon as possible to SAHRA (Contact details: Dr Ragna Redelstorff, SAHRA, P.O.Box 4637, Cape Town 8000. Tel: 021 202 8651. Email:

rredelstorff@sahra.org.za, so that appropriate mitigation (i.e. recording, sampling or collection) by a palaeontological specialist can be considered and implemented.

### **Contractors and Service Providers:**

All Contractors (including subcontractors and staff) and service providers are ultimately responsible for:

- Complying with the environmental management specifications;
- Submitting an obligatory Methods Statement for approval by the ECO before any work is undertaken;
- Adhering to any instructions issued by the Project Manager on advice of the ECO;
- Submitting a report at each site meeting which will document all incidents that have occurred during the period before the site meeting;
- Keeping on file the list of transgressions issued by the ECO in the site office;
- Maintaining a public complaints register; and
- Arrange for all employees and those of subcontractors to receive training before the commencement of construction in order that they are aware of the conditions of the EMP.

## **4.2. Monitoring**

A monitoring programme will be put in place not only to ensure conformance with the EMP through the contract/work instruction specifications, but also to monitor any environmental issues and impacts which have not been accounted for in the EMP that are, or could result in significant environmental impacts for which corrective action is required.

An Environmental Control Officer must be appointed to ensure compliance with the EMP, and to carry out monitoring activities. The Environmental Control Officer must have the appropriate experience and qualifications to undertake the necessary tasks. The Environmental Control Officer will report to the Project Manager should any non-compliance be evident or corrective action necessary.

All instruments and devices used for the measurement or monitoring of any aspect of this EMP must be calibrated, appropriately operated and maintained, and records well kept.

## **4.3 Non-Conformance and Corrective Action**

The monitoring of the mining and construction or operation of the road may identify non-conformances to the EMP. Non-conformances may also be identified through incidents, emergencies or complaints. In order to correct these non-conformances, the source must be determined and appropriate corrective actions must be identified.

### ***Compliance with the Environmental Management Plan***

- The EMP will be available on-site at all times;
- All persons employed by the Contractor or his sub-contractors will abide by the requirements of the EMP;
- Any members of the construction workforce found to be in breach of any of the specifications contained within the EMP may be ordered by the Project Manager to leave the site. The order may be given orally or in writing.
- Confirmation of an oral order will be provided as soon as practically possible, but the absence of a written order will not be cause for an offender to remain on site. No extension of time will be granted for any delay or disadvantage to the Contractor brought about by an offender ordered to leave the site;
- The Contractor will not direct a person to undertake any activity which would place them in contravention of the specifications contained within the EMP;



- Should the Contractor be in breach of any of the specifications contained in the EMP, the Project Manager will, in writing, instruct the Contractor responsible for the incident of non-compliance regarding corrective and/or remedial action required, specify a timeframe for implementation of these actions, implement a penalty and/or indicate that work will be suspended should non-compliance continue;
- Should non-compliance continue, further written notification will be forwarded to the Contractor responsible for the incident of non-compliance outlining the required corrective and/or remedial action, the timeframe for implementation, penalties and/or work will be suspended as specified previously;☐
- The Contractor will be responsible and will bear the cost of any delays, corrective or remedial actions required as a result of non-compliance with the specifications and clauses of the EMP;
- Departmental officials will be given access to the property for the purpose of assessing and/or monitoring compliance with the conditions contained in the EMP, at all reasonable times

#### 4.4 ENVIRONMENTAL AWARENESS PLAN

##### **On-site Start up meeting:**

The Mandatory On -site Start up meeting must be conducted at least 14 days but not less than 5 working days prior to commencement of any site/camp establishment, earthworks and/or construction activities and will relate to additional discussed information that must be complied with during the construction phase.

On-site Start-up Meeting points of discussion are:

- The construction EMP& other relevant site documents
- Discussion of the Environmental Authorisation
- Project to be discussed and all uncertainties are cleared
- Method statements to be discussed
- Road and construction areas to be demarcated
- Materials stockpile and lay down areas to be demarcated
- Method of stockpiling to be discussed
- Firefighting procedures
- Mandatory firefighting equipment and fire preventative measures
- Solid waste removal
- Placement type and service of the toilets to be agreed on
- Placement and types of rubbish bins and removal of rubbish to be agreed on
- Environmental Education and awareness training to all contractors & onsite staff/labour

## 5 Site Specific Mitigation measures

### 5.1 AIR QUALITY

#### **Sources:**

- Fuel burning engines;
- Fire; and
- Dust generation at borrow pit and on access roads.

#### **Mitigation measures:**

- All activities on site must comply with the requirements of the Atmospheric Pollution Prevention Act (Act No. 45 of 1965) and/or the National Environmental Management: Air Quality Act (Act No. 39 of 2004);

- Burning of materials including wood, grass and refuse which emit visible smoke will not be permitted on site;
- Waste must be disposed, as soon as possible at a licensed municipal site. Waste must not be allowed to stand on site to decay, resulting in malodours and attracting vermin; and
- No open fires are to be allowed on site.

**Maintenance:**

The Contractor will ensure that all vehicles and machinery are fitted with appropriate emission control equipment, are maintained frequently and serviced to the manufacturers' specifications.

**Corrective Actions:**

If monitoring results or complaints indicate inadequate compliance with the EMP, the source of the problem must be identified and existing procedures or equipment modified to ensure that the problem is rectified

## 5.2 Dust Control

**Potential Impacts:**

Dust and particulates from vehicle usage, excavations, temporary stockpiles and land clearing.

**Sources:**

- Dust caused by strong winds
- Clearing of vegetation and topsoil;
- Loading and unloading of trucks;
- Dust caused by vehicle movement on access route; and

**Controls:**

- Dust will be monitored
- If dust becomes a problem, dust will be controlled by means of water spray vehicles or other practical means
- No over-watering of the mining area or roads surfaces should occur
- Speed limits must be enforced in all areas, including public roads and private property to limit the levels of dust pollution, avoid dangerous conditions and limit excessive deterioration of the access route. Max speed of 40km/h maintained on the construction site;
- Under extreme windy conditions, work will be stopped

**Maintenance:**

- A complaints register will be developed to manage the complaints relating to impacts on the landowners and nearby communities (Although there are no nearby communities expected near the site).

**Corrective Actions:**

If monitoring results or complaints indicate inadequate compliance with the EMP, the source of the problem must be identified and existing procedures modified to ensure that the problem is rectified.

## 5.3 NOISE MANAGEMENT PLAN

**Potential Impact:**

Nuisance noise from excavation and hauling of excavated material is expected to be very low and will not impact surrounding communities. The site is not close to any community/ development.

**Sources:**

- Excavations
- Noise from trucks collecting gravel material

**Controls:**

- Excavation and hauling activities should be limited to daylight hours.
- Surrounding communities and neighbours should be notified before site establishment of activities that will be conducted on site.
- Compliance with appropriate legislation with respect to noise is mandatory, although no noise pollution is expected.

**Maintenance:**

- The excavator and hauling trucks must be maintained in a good working order.
- A complaints register must be kept on site for anyone who wishes to lodge a complaint pertaining to noise pollution.

**Corrective Actions:**

- The Contractor will respond timeously in the event of any complaints by local residents or others about disturbing noise. The noise source will be identified and appropriate noise mitigatory measures instituted in consultation with the affected party(ies); and
- In the case of legitimate complaints, the noise level must be tested by a specialist.

## 5.4 SOIL MANAGEMENT PLAN

### 1.1.1 Topsoil

**Controls:**

- Topsoil will be removed from all areas where physical disturbance of the surface will occur, prior to the disturbance occurring.
- Topsoil will be removed when the access route is scraped. Due to the short duration of the project, topsoil stripped from the access route will be kept next to the route, to use for rehabilitation.
- Topsoil stripped from borrow pit site will be stockpiled, stored and protected on site for rehabilitation after the project is completed.
- In the event of a hydrocarbon spill, the contractor must take the suitable measures to contain the pollution and prevent it from spreading or seepage. Once this spill has been contained, contaminated material (soil, etc) shall be removed and disposed of at a registered hazardous waste disposal site.
- Topsoil management plan need to be agreed upon site start up meeting

**Maintenance:**

- Topsoil removed will be stored in such a way that it will not cause damming up of water or wash away, and will not exceed a height of two metres.
- Stored topsoil will be free of deleterious matter such as large roots, stones, refuse, stiff or heavy clay which would adversely affect its suitability for planting

### 5.4.1 Excavation

**Controls:**

- Any excavations must be undertaken within the confines of the corner coordinates given on the locality map.
- The responsible Environmental Control Officer (ECO) should monitor all substantial (> 1 m deep) excavations for fossil material. In the case of any significant fossil finds during construction (e.g. vertebrate teeth, bones, burrows, petrified wood, shells), these should be safeguarded - preferably in situ - and reported by the ECO as soon as possible to SAHRA (Contact details: Dr Ragna Redelstorff, SAHRA, P.O.Box 4637, Cape Town 8000. Tel: 021 202 8651. Email: rredelstorff@sahra.org.za, so that appropriate mitigation (i.e. recording, sampling or collection) by a palaeontological specialist can be considered and implemented.
- The perimeter of the mining area shall be fenced with stockpile fencing to keep out animals and to ensure that excavations do not take place in no-go areas or outside of the development footprint.
- Excavated material will be hauled away on trucks to the Brandvlei Waste Water Treatment Works where it will be used for construction of an artificial wetland.
- The laydown area, where trucks will upload gravel material, will also be fenced with stockpile fencing to ensure trucks stay clear of no-go areas.

**Maintenance:**

Regular daily inspections are essential to ensure no-go areas remain clear.

#### 5.4.2 Erosion and Stormwater Control

**Controls:**

- During excavations, borrow pit slopes shall be profiled so ensure that they are not subjected to excessive erosion
- In terms of stormwater control, the natural slope of the hill be kept intact, so when rain does fall, it will flow its natural course. The area is not subjected to high rainfall.
- Natural storm water run-off, which is not polluted by the site operations, must be diverted around topsoil stockpile.
- All cleared areas will be proactively rehabilitated and in accordance with specific instructions from the Project Manager;

#### 5.5 WASTE MANAGEMENT PLAN

**Potential Impacts:**

- Inefficient use of resources resulting in excessive waste generation; and
- Litter or contamination of the site or water through poor waste management practices.

**Sources:**

- Packaging;
- Construction wastes;
- Domestic waste from staff on site.

**Controls:**

- Adhere to waste management guidelines and any relevant license conditions imposed.
- Where possible, construction wastes on site must be reused or recycled;
- Disposal of waste must be in accordance with relevant legislative requirements;
- The Contractor must familiarise themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation;
- The contractor will appoint a person to manage and control waste;
- Integrated waste management on site will be carried out by applying, in order of preference, waste avoidance, reuse, recycling and environmentally responsible disposal;
- Burning of waste material will not be permitted;

- The Contractor will provide and maintain adequate facilities for litter collection (e.g. bins) at strategic locations around the site camp such as the office, parking, housing facilities and locations where food is consumed. All refuse receptacles shall be weather-, tamper- and vermin- proof;
- A high quality of housekeeping will be maintained on the mining and construction sites to ensure that materials are not left where they can be washed or blown away to become litter;
- Littering must be prohibited and routine clean-up drives must be implemented;
- Stockpiled waste must not remain on site for longer than 30 days;
- The Contractor must supply waste bins/skips throughout the site at locations where mining and construction personnel or labourers are working. The bins must be provided with lids and an external closing mechanism to prevent contents from blowing out, and must be scavenger proof to prevent animals attracted to waste. Bins must be emptied on a regular basis and the waste removed to the construction camp where it must be contained in scavenger, water and windproof containers until disposed of;
- Waste (general and hazardous) generated during the construction phase may only be disposed of at appropriately licensed sites in terms of applicable Environmental legislation;
- The collection, storage and disposal of waste may not cause any nuisance (odours, fumes, aesthetic impacts, etc.);
- No waste may be disposed of on neighbouring land;
- Anything recyclable must be recycled; and
- Illegal dumping must be prohibited.

#### **Maintenance:**

- Litter collection at the mining and construction sites will be undertaken at least once per working day. Work teams will be supplied with refuse bags which can be disposed of daily in skips at centralised locations;
- All waste containers will be emptied at least once a week; and
- Waste documentation must be completed and kept on site.

#### **Corrective actions:**

- A complaints register must be maintained, in which any complaints from the community must be logged (although no community is in close proximity). All complaints must be investigated and, if appropriate, acted upon; and
- Corrective actions are required to be undertaken immediately after a complaint is made or a non-conformance is identified.

## **5.6 HANDLING AND STORAGE OF HAZARDOUS WASTE**

#### **Potential Impacts:**

- Contamination of soil from trucks and excavator through hydrocarbon/ oil spills
- Contamination of soil from temporary ablution facilities

#### **Controls/ mitigation**

- No hazardous waste (i.e. hydrocarbon/ fuel/ oil) to be stored on site.
- No refuelling of trucks will be permitted on site
- Ensure spill kits are available on site to clean up potential spills and leaks
- The contractor is responsible for the training of workers with regards to spill response
- Ensure drip trays are available to place under any stationary vehicles/ excavator
- Ensure temporary ablution facilities are maintained and serviced and sewage is disposed of at a licensed facility.

#### **Maintenance:**

- Any accidental spills to be corrected immediately
- Waste records must be kept available for review
- Implement appropriate actions and measures to reduce or prevent contamination of the ground and surface water as a result of a spill of potentially hazardous substances.

**Corrective Actions:**

- Observation and supervision of vehicle maintenance throughout the project life cycle
- Arrange and supervise the implementation of cleanup operations and appropriate disposal of contaminated materials at the hazardous waste disposal site;
- A complaints register must be maintained, in which any complaints from the community (although no community in close proximity to the site) must be logged. All complaints must be investigated and, if appropriate, acted upon;
- Keep written records detailing the type of spill, the corrective and remedial measures implemented in the stopping or reduction of the spill, and the clean up of the spill. Such progress reporting is important for monitoring and auditing purposes and the written reports may afterwards be used for training purposes in an effort to prevent similar future occurrences;
- Report the nature and extent of the spill to the ECO or Project Manager, as soon as reasonably possible, but within 24 hours.

## **APPENDIX 1: DECLARATION OF UNDERSTANDING**

# DECLARATION OF UNDERSTANDING

I \_\_\_\_\_

Representing: \_\_\_\_\_

Declare that the conditions of the EMP were brought to my attention and that I have read and understood the contents of this Environmental Management Plan and that a copy of this EMP has been made available to me.

Site: \_\_\_\_\_

Date: \_\_\_\_\_

I also declare that I understand my responsibility in terms of enforcing and implementing the Environmental Specifications as set out in this Environmental Management Plan.

I also undertake to inform all persons under my supervision of these specifications and the contents of the Environmental Management Plan.

Signed: \_\_\_\_\_

Place: \_\_\_\_\_

Date: \_\_\_\_\_



Witness 1: \_\_\_\_\_

## **APPENDIX 2: START-UP REPORT**

To be included after start-up meeting.

## **APPENDIX 3: ENVIRONMENTAL EDUCATION**

# ENVIRONMENTAL TRAINING FOR CONSTRUCTION.

## The why, what and how...

### BUT WHY...

#### ... should we care about the environment?

The environment provides us with everything we need to survive – food, water, fuel, air, etc. Human activity uses resources and has an impact on those resources. Managing our resource use and ensuring that our impact is minimized will ensure that these resources are not depleted.

The Constitution says that all people in South Africa have the right to a healthy environment. If you damage the environment, you are taking away that basic right of others as well as future generations – your children and grandchildren!

#### ...environmental management if there is already conservation?

Historically, development and environmental conservation have been in conflict, because conservation was understood as the protection of resources, and development as the use, or exploitation of resources. The two competed for the same resources, but both are needed! Enter: *SUSTAINABLE DEVELOPMENT*.

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable development thus aims to improve the quality of human life while living within our ecological means = the wise use of resources!

#### ...environmental management of construction?

South Africa's effort to attain sustainable development is based on the concept of Integrated Environmental Management (IEM). The purpose of IEM is to resolve or lessen any negative environmental impacts and to enhance positive aspects of development.

IEM is designed to ensure that the environmental consequences of development proposals are understood and adequately considered in the planning, implementation and management of all developments.

It is intended to guide, rather than impede the development process by providing a method of gathering, analysing and utilising information about the environmental impacts of development. IEM and other principles of Environmental Management are set out in the National Environmental Management Act (No. 107 of 1998) & National Environmental Management Amendment Act (No. 62 of 2008)

### BUT WHAT...

#### ...exactly is the 'environment'? What if we're not working near rivers or fynbos or leopard toad habitat?

The environment is not only the 'conservation-worthy' such as rare plants and endangered animals. The environment is everything around you!

It is made up of living things (e.g. people, plants & animals) and non-living things (e.g. soil, water, buildings & cars). People and man-made things are also important parts of the environment.

Protection of the environment means that all living and non-living things are protected. During construction, Environmental Management Programmes (EMP's) are implemented not only to protect fynbos or leopard toads but also to protect people (both on site and off), property (houses, cars, etc.) as well as natural resources such as water, air and soil.

### **...do Environmental Management Programmes (EMP's) do? What does this mean for my contract?**

EMPs are tools to facilitate environmental management during the construction phase of development projects and thereby avoid *unnecessary* impacts to the environment.

In the past, the functionality and efficiency of EMPs was hampered by resistance from contractors and engineers, the difficulties of costing for compliance and the lack of legal enforceability.

Now Environmental Management Programmes (EMP's) are stipulated in the Environmental Authorisations (ROD) as a condition of the approval to go ahead with the development, in other words it is legally binding.

When you sign a contract do work on a project with an EMP, you are legally bound to comply with that EMP!
---

Methods of implementing EMPs are becoming more and more stringent and issues of enforceability are being addressed. Those individuals and companies that are familiar with compliance with EMPs will be at a competitive advantage!

### **...do EMPs consist of?**

EMPs usually contain an environmental policy statement, organisational structure detailing the responsibilities and authorities involved in the project, procedures for communication and record-keeping and environmental specifications.

EMPs are adapted to the scale and sensitivity of the construction project. They can be thick documents detailing specifications for every eventuality specifically adapted to the project, or they can be short and brief documents setting out standard environmental procedures and controls. Sometimes EMPs include extensive penalty and incentive schemes.

<h4>A WORD ON METHOD STATEMENTS:</h4>
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<p>A method statement can be requested or proposed when an activity is either not included in the EMP at all, if the EMP specifications for an activity are not deemed adequate, if an activity is required that is not allowed by the EMP, etc. In other words, when the EMP does not give enough information to manage the environmental impact of a specific activity.</p>
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<p>A method statement is defined as a written submission by the Contractor setting out the plant, materials, labour and method proposed to carry out an activity. Method statements must provide enough detail that the environmental impact of the activity can be assessed. Method statements must therefore be submitted well in advance of the activity (usually at least 5 days but sometimes more).</p>
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<p>Method statements are therefore an extension of the EMP, are also legally binding and are intended to ensure that the environmental implications of an activity outside of the EMP can be addressed.</p>
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<p>Method statements usually require the approval by the engineer, the ECO/ESO/DEO, etc. before the activity can take place. If such an activity takes place without approval and result in environmental damage, the contractor is responsible for the cost of rehabilitation/clean-up/etc.</p>
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### **...is an ECO, ESO, DEO, etc.?**

EMPs usually require the appointment of an ECO, ESO, DEO, etc. to oversee the implementation of and compliance with the EMP on behalf of the engineer or the contractor(s). Ultimate responsibility for compliance with the EMP lies with the contractor(s) and the engineer.

ESO = Environmental Site Officer – usually on site permanently or often. Can be independent consultant or from contractor/engineer.

ECO = Environmental Control Officer – usually visits site on a regular basis and audits compliance with the EMP. Usually independent consultant.

DEO = Designated Environmental Officer – usually on site permanently, usually member of contractor or engineer site staff.

Organisational structures and responsibilities differ from project to project and depend on environmental sensitivity of the project, scale of the project, etc. Increasingly nowadays, each party is required to appoint their own person responsible for environmental management on site, e.g. the engineer would have an ESO/ECO and the main contractor(s) would have an ESO/DEO etc.

It is therefore important to familiarise yourself with that part of the EMP that deals with organisation and responsibilities for each contract that you are involved in.

## **BUT HOW...**

### **...do EMPs promote sustainable development?**

They don't!

It is the people on site that protect the environment. The EMP, like any other plan or policy, is not worth anything if there isn't a commitment from those working on the project to compliance with the EMP.

### **...can I ensure my work comply with the EMP?**

Environmental specifications in different EMPs can vary from vague to very detailed.

- Firstly, it is obviously important to know what those specifications are, vague or not, so **READ THE DOCUMENT!** Ignorance does not absolve you from your responsibility. A copy of the EMP must be kept at the site office at all times.
- It also helps to understand **WHY** those specifications are there – some things are obvious but others may not be. Some EMPs may have specifications that are not relevant. Don't be afraid to question the EMP; it can only increase its efficiency!
- Know where the sensitive areas on site are – watercourses, wetland areas, residential areas, etc. – and be extra vigilant when working in these areas.

Mostly environmental management of construction activities and compliance with EMPs require only common sense and with good housekeeping the battle is half won!

The enclosed environmental hand-out sets out the standard environmental specifications

## DO'S AND DON'TS (1)

**Workers & equipment must stay inside the site boundaries at all times.  
Nobody may enter areas marked as No-go areas.**

*Why?* Construction activities, equipment and people cause damage and disturbance to the area surrounding the site. As small an area as possible will be affected if all workers and equipment stay within the site boundaries. This is especially important if there are people who live around the site or natural areas around the site which should not be disturbed.



**Do not swim in or drink from streams.  
Do not throw oil, petrol, diesel, concrete or rubbish in streams.  
Do not work in the stream without direct instruction.  
Do not damage the banks or plants of streams.**

*Why?* River water may be polluted which could make you sick. Oil, petrol, diesel, concrete or rubbish will kill plants and animals living in the water. They may also make people who may drink the water downstream sick. Rubbish in the stream also makes it look ugly. People and machinery working in the stream will damage it and kill plants and animals living in the stream. It may also cause erosion, which is expensive to repair. The plants on the edge of the stream bind the soil together and prevent soil from getting washed away. Soil washed into a stream may affect people using the water downstream (e.g. for irrigation).



**Protect animals on the site.  
Ask your supervisor to remove animals found on site.**

*Why?* Animals are an important part of the environment. All animals have a purpose, even snakes which catch mice and rats. Other important animals are owls, chameleons and frogs.



**Do not damage or cut down any trees or plants without permission.  
Do not pick flowers.**

*Why?* Some plants are rare and may take a long time to grow back, if at all. Plants in the “no go” areas should not be damaged. Some plants will die if their flowers are picked. Rare plants may be lost.



**Put cigarette butts in a rubbish bin.  
Do not smoke near gas, paints or petrol.  
Do not light any fires without permission.  
Know the positions of firefighting equipment.  
Report all fires.  
Do not burn rubbish/ vegetation without permission.**

*Why?* Leaving a burning cigarette butt on the ground may lead to runaway fires which are dangerous to construction workers, people living around the site, equipment, houses, plants and animals. Smoking near flammable material is dangerous and may cause an explosion. Lighting a fire without permission may cause a runaway fire (see above). Reacting quickly to fires that break out will prevent them from spreading and causing damage.

## DO'S AND DON'TS (2)



**Work with petrol, oil & diesel only in designated areas.**  
**Report any petrol, oil & diesel leaks or spills.**  
**Use a drip tray under vehicles & machinery.**  
**Empty drip trays after rain & throw away were instructed.**

*Why?* Designated areas should have measures to protect against petrol, oil & diesel spills. Oil, petrol and diesel can drip onto the soil and soak into it. Plants will not grow and animals will not live in dirty soil. It also looks ugly to people living around the area.

Drip trays will prevent oil, petrol or diesel from soaking into the soil and killing plants and animals.

If drip trays are not emptied they may overflow and pollute the surrounding soil. If oil, petrol or diesel is put into a stream, plants and animals living in the stream will be killed. They may also make people who may drink the water downstream sick. Ask your supervisor where drip tray water may be disposed of on site.



**Try to avoid producing dust – wet dry ground and stockpiles.**

*Why?* Dust can be irritating to people and can reduce production on site. It can cause problems such as eye irritations and coughs. It also reduces visibility on and around the site, which can be dangerous to drivers and pedestrians, and can cause damage to the surrounding environment.

Soil should not be made too wet because that will cause safety problems and soil may be washed away.



**Do not make loud noises around the site, especially near schools and homes.**  
**Report or repair noisy vehicles.**

*Why?* Loud noises are irritating to workers and people living around the site. Loud noise can also be harmful to people (especially children) and affect their hearing.

By keeping vehicles in good condition, loud noise can be prevented.



**Use the toilets provided.**  
**Report full or leaking toilets.**

*Why?* Sewage attracts flies and other irritating pests. If the site is near a river or stream, sewage makes the water smell and people who swim in it or use it to wash their clothes will get sick. It also causes plants to grow too much which blocks the river, which may cause flooding of houses and property.

Regular emptying of toilets is hygienic and will also prevent overflows.



**Make sure that you eat where there is a rubbish bin nearby.**  
**Never eat near a river or stream.**  
**Put packaging & leftover food into rubbish bins.**

*Why?* Eating areas generate a lot of rubbish and litter (e.g. bottles and packets) which will pollute the site and surrounding areas. Therefore, eating must be done near bins which are placed in the eating.



Rubbish in a stream looks ugly and can be harmful to people's health. It may also kill the plants and animals living in the stream. Rubbish and food left lying around will attract pests (such as rats) which are dangerous to people and cause a health hazard. Also, rubbish left lying around is ugly and unpleasant to look at.



**Do not litter—put all rubbish (especially cement bags) into the bins provided.**  
**Ask your supervisor for a bin if there is none. Bins must be provided.**  
**Report full bins to your supervisor.**  
**The responsible person should empty bins regularly.**

*Why?* Litter is ugly. It is also dangerous and unhealthy to adults, children and animals walking around the area. Not putting the lid back on the bin will cause rubbish to be blown away. Regularly emptying bins will prevent litter and rubbish flying around the site.



**Always keep to the speed limit.**  
**Drivers - check & report leaks.**

**Ensure loads are secure & do not spill.**

*Why?* Speeding is dangerous to people who live in the area, especially children. Speed kills! Faulty vehicles are dangerous to the driver, pedestrians and other motorists. Leaks can also pollute the ground and water and smoke from vehicles can cause health problems. This is a potential danger to other motorists. Also, do not overload vehicles.



**Know all the emergency phone numbers.**

*Why?* Prompt reaction to an accident, fire or spill will reduce the risk of serious damage to the environment and to workers.



**If rules are broken:**  
**- Spot fines**  
**- Removal from site.**  
**- Construction may be stopped.**

*Why?* Failure to adhere to the EMP may result in spot fines being issued to the company. It is then the Site Agent's responsibility to collect these fines from guilty individuals and he may even deduct fines off your wages. The fines are meant to act as an incentive for workers to take the EMP seriously. A person may be removed from site if they continually disregard the specifications in the EMP. If the EMP is not adhered to, the local Environmental Authority may stop construction.



**Report any breaks, floods, fires, leaks and injuries to your supervisor.**  
**Ask questions!**

**Thank you for your attention.**

## **APPENDIX 4: BASIC RULES OF CONDUCT**

## BASIC RULES OF CONDUCT

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

**NOTE: ALL new site personnel must** attend an environmental awareness presentation. Please inform your foreman or manager if you have not attended such a presentation or contact the ESO.

### DO:

- Use the toilet facilities provided – report dirty or full facilities
- Clear your work areas of litter and building rubbish at the end of each day – use the waste bins provided and ensure that litter will not blow away.
- Report all fuel or oil spills immediately & stop the spill continuing.
- Dispose of cigarettes and matches carefully. (Littering is an offence.)
- Confine work and storage of equipment to within the immediate work area.
- Use all safety equipment and comply with all safety procedures.
- Prevent contamination or pollution of streams and water channels.
- Ensure a working fire extinguisher is immediately at hand if any “hot work” is undertaken e.g. welding, grinding, gas cutting etc.
- Report any injury of an animal.
- Drive on designated routes only.
- Prevent excessive dust and noise.

### Do not:

- Remove or damage vegetation without direct instruction.
- Make any fires.
- Injure, trap, feed or harm any animals – this includes birds, frogs, snakes, lizards etc.
- Enter any fenced off or marked area.
- Allow cement or cement bags to blow around.
- Speed or drive recklessly
- Allow waste, litter, oils or foreign materials into the stream
- Swim in the dam.
- Litter or leave food laying around

### Notes:

If any animals such as tortoises, chameleons or snakes be encountered then do not harm them. The ECO or Site Supervisor must be contacted to remove these safely. The harming of any animal will result in disciplinary action.

Construction and heavy machine operators must be particularly sensitive to staying within access routes and prevention of unnecessary damage. Dust and noise is also of particular concern. Ensure that vehicles and machinery do not leak fuel or oils. Refuelling or maintenance must be done within the maintenance camp area only.

Alien plant clearing and control work teams must be closely supervised.

## BASIESE GEDRAGSKODES

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Die volgende lys verteenwoordig die moets en moenies vir omgewingsbewustheid wat alle deelnemers aan hierdie projek in ag moet neem tydens die uitvoer van hul take. Hierdie lys is nie volledig nie en dien slegs as 'n vinnige verwysing.

**Nota: alle nuwe terreinpersoneel moet 'n aanbieding ten opsigte van omgewingsbewustheid bywoon.** Indien u nog nie so 'n aanbieding bygewoon het nie, lig asseblief u voorman of bestuurder in of kontak die omgewings terreinbeampte.

### Moets:

- Gebruik die beskikbare toilet-geriewe – rapporteer vuil of vol geriewe.
- Maak u werkplek skoon van rommel of bourommel aan die einde van elke dag – gebruik beskikbare vullisdromme en verseker dat rommel nie rondwaai nie.
- Rapporteer alle brandstof- en olie stortings onmiddellik – stop verdere storting.
- Wees versigtig met die wegdoen van sigarette en vuurhoutjies. (rommelstrooi is 'n oortreding.)
- Beperk werkaktiwiteite en die stoor van toerusting tot die onmiddellike werkarea.
- Gebruik veiligheidstoerusting en voldoen aan alle veiligheids-maatreëls.
- Voorkom besoedeling van strome en waterbane
- Verseker dat 'n brandblusser in werkende toestand byderhand is wanneer “warm” werk verrig word bv. Sweis, wegslyp, gasny, ens.
- Rapporteer beseerde diere.
- Ry slegs op aangewese roetes.
- Voorkom oormatige stof en geraas.

### Moenie:

- Plantegroei verwyder of beskadig sonder direkte instruksie nie.
- Enige vure maak nie.
- Enige diere dood, beseer, vang of voer nie, insluitende voëls, paddas, slange, akkedisse, ens.
- Enige omheinde of afgesperde areas binnetree nie.
- Sement of sementsakke laat rondwaai nie.
- Vinnig of roekeloos bestuur nie.
- Enige rommel, afval, olie or enige vreemde materiaal in strome laat beland nie.
- In die dam swem nie.
- Rommelstrooi of kos laat rondlê nie.

### Notas:

Indien enige diere soos skilpaaie, verkleurmannetjies of slange teëgekom word, moet hulle nie beseer of dood nie. Kontak die otb of ri om hulle veilig te verwyder. Die besering van diere sal lei tot dissiplinêre optrede.

Operateurs van konstruksie- en swaar masjiene moet veral versigtig wees om binne toegangsroetes te bly en om enige onnodige skade te voorkom. Verseker dat voertuie en masjiene nie olie of brandstof lek nie.

Brandstofaanvulling en voertuigonderhoud mag slegs binne die onderhoudsarea gedoen word.

Streng toesig moet gehou word oor indringerplantbeheerspanne.



## EZIPPHAMBILI EKUNYANZELEKILEYO UKUBA ZENZIWE

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Zonke ezi zinto zilandelayo zizinto ekufuneka zenziwe nekufuneka zingenziwanga.

Wonke umntu ofikayo kufuneka afundiswe ngemigaqo kupala. Nceda yazisa iforman yakho ikuba awukhange uye kufundiswa.

### Izinto emazenziwe

- Sebenzisa izindlu zangasese, yazisa xa kukho umonakalo.
- Zama ukucoca apho ubusebenza khona.
- Sebenzisa imigqomo yenkukuma ungayeki iphaphtieke.
- Yazisa xa ubona ioil echithskalayo okanye ipetrol.
- Cima lozoli cigarette xa ugqibibile ukutshaya
- Zonke izixhobo usebenza zibuyisele apho zihlaka khona xa ugcibile apho zihlala khona xa ugqibile ukuzisebenzisa.
- Zisebenzise izikhuselixa uzinkiwe.
- Sukugalela izinto emlanjeni.
- Masibekho isicima mlilo xausebenza ngomlilo.
- Yazisa msinyane xa ubone isilwanyana ezonzakeleyo.
- Xauqhuba isithuthi hamba endleleni qha ungafathulinje.
- Naphina zamaunenzi thuli okanye ingxolo xa usebenza.

### Emazingenziwa

- Sukususa nesiphina isityalo ungakhange uxelelwe
- Sukwenza mlilo nokuba sekubanda
- Amagqara ukubulala izilwanyana nokuzifida akuvumelekanga
- Sukungena xa kuvaliwe ngaphandle kwe mvume
- Ingxowa zesamente mazincedwe zingahlwa nje
- Sukuqhuba ngesantya esiphakamileyo
- Sukugalele nayiphi into phaya emlanjeni
- Sukuqubha edameni q oqosha yonk inkukuma

## **APPENDIX 5: PENALTIES FOR NON-COMPLIANCE**



**PENALTIES FOR NON-COMPLIANCE**

The contractors / sub-contractors must contact the ECO at any stage if unsure about any matter, or if a pollution incident occurs, or vegetation or animals are damaged.

ECO = Environmental Control Officer ESO= Environmental Site Officer

PHASE	Penalty for Non-compliance	
	Bottom range	Top Range*
<b>PRE-CONSTRUCTION PHASE</b>		
Construction area to be marked off before construction starts.		5000
The demarcated area must be maintained throughout the construction phase	500	1000
Site area for stock piling of building material must be demarcated	500	5000
Site area for storing of waste material must be demarcated	500	5000
Fencing off the construction site with mesh fencing of 1.8m, where necessary or other suitable material as agreed on by ECO	500	1000
Sitting of access road/s to be approved by ECO & demarcated with stakes before any construction starts (if applicable)		5000
Temporary route used for construction must be determined on site with ECO (if applicable)	1000	5000
Telecommunications & AC power routes must be determined with the ECO (if applicable)	1000	5000
Sensitive features that may be harmed must be clearly marked or demarcated.	500	2000
Vegetation that may not be removed must be clearly marked or demarcated.	500	5000
Contractor must make the Construction team and all sub-contractors aware of all environmental aspects that could lead to imposition of penalties	100	5000
Contractor to sign Declaration of understanding (DOU) before construction starts		5000
Contractor to assure that all subcontractors be informed and signed DOU	1000	5000
Method statements must be provided on request by the ECO. No work may commence until the Method Statement is accepted by the ECO and Engineer	1000	5000
<b>CONSTRUCTION PHASE</b>		
<b>Information</b>		
A copy of the EMP & Record of Decision with all the conditions of approval, and the relevant Method Statements must be at site at all times.	200	5000

<b>Construction crew behaviour</b>		
Construction crews may not overnight on site.	200	5000
No amplified music allowed on site	100	200
Construction crew must stay within the demarcated construction area. (Applicable in sensitive sites)	50	500
Eating of meals only allowed in demarcated area	50	500
No pets permitted on site		100
Driving, Parking & Storing of machinery and vehicles are only allowed inside demarcated areas and existing roads	1000	5000
Machinery may only be used on the road and may not disturb the vegetation on the sides of the road except if cleared by ECO. Machinery used must be carefully considered to limit environmental damage	500	5000
No vegetation other than that agreed on may be damaged - i.e. no access to areas outside construction area.	500	2000
No individual may cause unnecessary damage to flora and fauna on, around or near the site	20	2000
No littering allowed (incl. cigarette butts)	50	500
<b>Excavations</b>		
No topsoil may be removed or altered outside the demarcated area and/or which was not specified.		2000
Commercial sources of sand, rock and gravel to be cleared with ECO	200	5000
All surplus material to be taken off-site and be disposed of at approved site	500	5000
<b>Toilets</b>		
Sufficient ablution facilities must be provided		3000
Toilets to be secured to prevent them from falling or blowing over.	100	1000
They must be serviced regularly, (according to the manufacturer's instructions) and kept clean.	100	1000
Everybody on site must make use of ablution facilities	50	1000
<b>Fire Prevention</b>		
All mandatory firefighting equipment (as specified at start-up) must be on site at all times	500	4000
Firefighting equipment to be in good working order and serviced.	500	2000
No fires, including cooking fires, allowed on site	1000	5000

<b>Cement</b>		
Concrete may only be mixed within the boundaries of the demarcated area and/or where was agreed on by the ECO.	500	5000
All excess cement & concrete mixes to be contained on construction site prior to disposal off site	200	5000
Any cement / concrete spillage to be cleaned up immediately.	500	5000
Ready-mix delivery trucks must not carry out the wash down of their trucks on or around the site unless arranged with ECO.	1000	3000
<b>Dust pollution control</b>		
Ensure that loose building material is covered to prevent dust pollution	100	1000
Water run-off		
Contamination of water bodies, rivers, dams or wetlands must be prevented at all cost	500	5000
Rainwater from construction & building site/s must be channelled, contained & allowed to dry out, so as not to transport any pollutants into the surrounding area. Temporary trenches, straw stabilising, brush cutting can be used	500	5000
<b>Waste control</b>		
Sufficient refuse bins must be placed on site	500	2000
Refuse bins must be cleaned on a regular basis	100	1000
General litter / building refuse must be cleaned up on a regular basis from the site	500	3000
Cement-contaminated water; paint; oil; cement slurries etc. must be stored in watertight containers or as agreed with ECO	500	5000
Store all refuse & waste material in wind & animal proof containers	100	1000
Waste must be disposed of at an official waste deposit site on a regular basis.	500	5000
The absence of or inadequate drip trays or bunding facilities	500	5000
Failure to address oil/fuel leaks from on-site machinery	200	5000
<b>Herbicides</b>		
No herbicides or pesticides whatsoever may be used.	200	2000
<b>Construction road</b>		
Road must be upgraded to prevent degradation and erosion of the road and surrounds.	500	5000

<b>Power and Telecommunications supply</b>		
Demarcate power supply route	500	5000
No vehicles to drive through vegetation unless authorised by ECO	500	5000
Storage of equipment may only take place at an area demarcated by the ECO.	500	5000
Working must be done in phases to prevent trampling of vegetation	N/A	
Use of generators and fuel powered equipment		
A watertight cover must be place under the power generator equipment to prevent accidental spillage of fuel & oil seeping into the soil.	500	5000
Drip tray must be able to take 120% of fuel on site	500	5000
All waste material generated from the use of this equipment must be contained and removed from the site	500	5000
Mobile fuel powered equipment must be well maintained and must not have any fuel or oil leaks.	200	5000
<b>Soil Stabilisation</b>		
Ensure that soil material for filling and stabilisation comes from a source that does not contain seeds alien to the area. The source must be cleared with the ECO.	100	2000
<b>Rehabilitation</b>		
Remove rocks and stones and stock pile in area recommended by ECO	500	5000
Remove all plants that can be used for rehabilitation and store on- or off-site in appropriate manner as agreed with ECO	200	5000
Removal of all old concrete and alien materials from site	500	5000
Site must be cleared of all waste and building material	500	5000

\*(Large scale / repeated offence)

## **APPENDIX 6: INFO ON METHOD STATEMENTS**

#### **INFORMATION ON METHOD STATEMENT**

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Method Statements are to be completed by the person undertaking the work (i.e. the Contractor). The Method Statement will enable the potential negative environmental impacts associated with the proposed activity to be assessed.

The Method Statement can only be implemented once approved by the ECO

The Contractor (and, where relevant, any sub-contractors) must also sign the Method Statement, thereby indicating that the works will be carried out according to the methodology contained in the approved Method Statement.

The ECO will use the Method Statement to audit compliance by the Contractor with the requirements of the approved Method Statement.

Changes to the way the works are to be carried out must be reflected by amendments to the original approved Method Statement; amendments require the signature of the ECO denoting that the changed methodology or works are necessary for the successful completion of the works, and are environmentally acceptable. The Contractor will also be required to sign the amended Method Statement thereby committing him/herself to the amended Method Statement.

This Method Statement **MUST** contain sufficient information and detail to enable the ECO to apply their minds to the potential impacts of the works on the environment. The Contractor will also need to thoroughly understand what is required of him/her in order to undertake the works.

**THE TIME TAKEN TO PROVIDE A THOROUGH, DETAILED METHOD STATEMENT IS TIME WELL SPENT. INSUFFICIENT DETAIL WILL RESULT IN DELAYS TO THE WORKS WHILE THE METHOD STATEMENT IS REWRITTEN TO THE ER'S AND ESO'S SATISFACTION.**

The page overleaf provides a *pro forma* method statement sheet, which needs to be completed for each activity requiring a method statement in terms of the EMP.

## **APPENDIX 7: EXAMPLE OF METHOD STATEMENT**

**PRO-FORMA METHOD STATEMENT**

---

**CONTRACT:**..... **DATE:**.....

**PROPOSED ACTIVITY** (give title of method statement and reference number):

**WHAT WORK IS TO BE UNDERTAKEN** (give a brief description of the works):

**WHERE ARE THE WORKS TO BE UNDERTAKEN** (where possible, provide an annotated plan and a full description of the extent of the works):

**START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:**

Start Date:

End Date:

**HOW ARE THE WORKS TO BE UNDERTAKEN** (provide as much detail as possible, including annotated maps and plans where possible):

Note: please attach extra pages if more space is required



**DECLARATIONS**

---

**1) ENVIRONMENTAL CONSULTANT AND/OR ENVIRONMENTAL CONTROL OFFICER**

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

\_\_\_\_\_  
(Signed) (Print name)

\_\_\_\_\_  
(Signed) (Print name)

Dated: \_\_\_\_\_

**2) PERSON UNDERTAKING THE WORKS**

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to other signatories and that the ESO will audit my compliance with the contents of this Method Statement

\_\_\_\_\_  
(Signed) (Print name)

Dated: \_\_\_\_\_

**3) THE APPLICANT**

The works described in this Method Statement are approved.

\_\_\_\_\_  
(Signed) (Print name) (Designation)

Dated: \_\_\_\_\_

**APPENDIX 8: CONTRACTOR ENVIRONMENTAL CHECKLIST**

**CONTRACTOR/S REPRESENTATIVE: ENVIRONMENTAL WEEKLY CHECKLIST**

SITE: \_\_\_\_\_

PHASE OF WORK AND % OF COMPLETION: \_\_\_\_\_

ENVIRONMENTAL ASPECT	YES/ NO (✓ or X)	COMMENTS
How many workers are on site		
All new personnel on site are aware of the contents of the EMP and have been through the environmental awareness course.		
Contractor's camp is neat and tidy and the labourers' facilities are of an acceptable standard.		
Sufficient and appropriate firefighting equipment is visible and readily available.		
Waste control and removal system is being maintained.		
Refuse bins in place and maintained		
Toilets are in place and clean		
Demarcation and other fences are being maintained.		
What machinery are on site		
Drip trays are being utilised where there is a risk of incidental spillage		
Bunds/ drip trays are being emptied on a regular basis (especially after rain).		
No leakages (oil & fuel) are visible from construction vehicles		
No go areas, remaining natural features and trees have not been damaged.		
Dust control measures (if necessary) are in place and are effectively controlling dust.		
Noise Control measures (if necessary) is in place and is working effectively.		
Erosion control measures (if necessary) are in place and are effective in controlling erosion. (Access road, site areas etc.)		
Stockpiles are located within the boundary of the site, do not exceed 2 m in height and are protected from erosion.		

Completed by:..... Sign:..... Date:.....

To be submitted at the end of each week to the Environmental Site Officer (ESO)

Received by:

Environmental Site Officer: :..... Sign:

Date:.....

**APPENDIX 9: ECO/ESO REPORT/CHECKLIST**

# ECO CONSTRUCTION SITE ENVIRONMENTAL INSPECTION REPORT

**Project Name:** \_\_\_\_\_

**Report no** \_\_\_\_\_

**Main Contractor:** \_\_\_\_\_

**Date** \_\_\_\_\_

**ECO:** \_\_\_\_\_

**EnviroAfrica Ref. no.** \_\_\_\_\_

ENVIRONMENTAL ASPECT	RATING	FINDINGS & RECOMMENDATIONS
RATING:	1 = EXTREMELY POOR    2 = POOR	3 = AVERAGE    4 = GOOD    5 = EXCELLENT
<p><b>1. DEMARCATION</b></p> <p>Boundaries of “no go” areas, construction sites, -offices, temporary storage areas as well as labourer’s facilities must be demarcated (EMP and ECO requirements) and maintained for the length of the construction period.</p>		
<p><b>2. NO-GO AREAS</b></p> <p>Identified “No-Go Areas”, must be demarcated for protection from construction damage (including secondary impact).</p> <ul style="list-style-type: none"> <li>• All areas outside of the demarcated construction site(s) and access road(s) to be regarded as NO-GO areas, including remaining natural veld identified trees.</li> <li>• Special attention to identified areas with significant vegetation.</li> </ul>		
<p><b>3. SEARCH &amp; RESCUE</b></p> <p>All flora identified for search &amp; rescue must be removed before any construction take place and re-used in pre-approved way.</p>		
<p><b>4. VEGETATION &amp; TOPSOIL REMOVAL</b></p> <p>Before any construction or earthworks, topsoil must be stripped (&gt;150mm) and stockpiled for rehabilitation/ landscaping. Stockpiles:</p> <ul style="list-style-type: none"> <li>• must be protected (erosion) and stored separately.</li> <li>• may not be moved further than 50m or mixed with any other soil.</li> <li>• must be convex and should not exceed 2m in height.</li> </ul> <p>In addition:</p> <ul style="list-style-type: none"> <li>• Cleared areas must be stabilized.</li> <li>• Burning or burying of cleared vegetation is prohibited (may be used for mulch or slope stabilisation on site).</li> </ul>		







ENVIRONMENTAL ASPECT	RATING	FINDINGS & RECOMMENDATIONS
RATING: 1 = EXTREMELY POOR 2 = POOR	3 = AVERAGE	4 = GOOD 5 = EXCELLENT
<p><b>18. ARCHAEOLOGICAL &amp; HERITAGE FINDS</b></p> <p>Should any archaeological or heritage remains be exposed during excavations or any activity on site, these must immediately reported to The site agent/engineer, the ECO HWC or SAHRA.</p>		
<p><b>19. METHOD STATEMENTS</b></p> <p>Method statements must be submitted and approved before commencement of the works.</p> <p><b>Possibly Required:</b></p> <ol style="list-style-type: none"> <li>1. Demarcation &amp; No-Go Areas (Map)</li> <li>2. Clearing of vegetation &amp; topsoil conservation</li> <li>3. Stockpiling &amp; temporary storage</li> <li>4. Construction camp &amp; site offices</li> <li>5. Labourer's facilities</li> <li>6. Mandatory site equipment</li> <li>7. Fuel storage</li> <li>8. Entrance &amp; haul roads</li> <li>9. Waste management</li> <li>10. Cement/Concrete mixing</li> <li>11. Dust control</li> <li>12. Erosion control</li> <li>13. Noise control</li> <li>14. Rehabilitation</li> </ol> <p><b>Additional Method Statements</b></p>		
<p><b>20. ENVIRONMENTAL CONDUCT</b></p> <p>Environmental conduct of construction personnel must be acceptable (e.g. no burning or burying of refuse; no littering and no cement bags or other construction waste material lying around).</p>		
<p><b>21. ENVIRONMENTAL CHECKLIST</b></p> <p>The contractor must ensure that the weekly environmental checklist is completed at the end of each week and it must be available at the site offices.</p>		
<p><b>22. REHABILITATION</b></p> <p>On completion of the project or phase, all areas impacted by the construction activities must be reinstated and/or rehabilitated to the</p>		



**ECO COMMENTS**

**End of report**

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**ECO Signature**



**APPENDIX 10: Environmental incident report format**

# ENVIRONMENTAL INCIDENT REPORT

No. \_\_\_\_\_

PROJECT NAME

PROJECT LOCATION

SITE AGENT

DATE OF INCIDENT

TIME

BRIEF DESCRIPTION AND CAUSE OF INCIDENT:

WHAT IMMEDIATE ACTIONS / CONTROL MEASURES WERE TAKEN:

WHAT CORRECTIVE ACTIONS WERE TAKEN TO ENSURE NO REPEATS OF THE INCIDENT:

ECO/ESO RESPONSE TO INCIDENT AND RECOMMENDATIONS:

IS THIS INCIDENT A:

FIRST OFFENCE

SECOND OFFENCE

THIRD OFFENCE

SIGNATURE OF SITE AGENT:

\_\_\_\_\_

DATE

\_\_\_\_\_

SIGNATURE OF ECO/ESO

\_\_\_\_\_

DATE

\_\_\_\_\_

REMEMBER TO BE FACTUAL WHEN DESCRIBING THE INCIDENT

**APPENDIX 11: Environmental complaints register**





## **APPENDIX 12: Method statement register**

METHOD STATEMENT REGISTER

SITE AGENT:

PROJECT NAME:

CONTRACTOR:

PROJECT LOCATION:

No.	METHOD STATEMENT ACTIVITY REFERENCE	DATE CREATED	DATE RECEIVED	CREATED BY	ACCEPTED / REJECTED	DATE APPROVED	APPROVED BY
1	Demarcation						
2	Clearing of vegetation and topsoil removal						
3	Stockpiling						
4	Temporary storage facilities						
5	Construction camp and site offices						
6	Fuel storage						
7	Labourer's facilities						
8	Entrance and haul roads						
9	Mandatory site equipment						
10	Waste management/control						
11	Cement mixing and batching areas						
12	Construction vehicle maintenance						
13	Dust control						
14	Erosion control						
15	Noise control						
16	Archaeological and heritage finds						
17	Rehabilitation						
18							

19 Additional MS (Waste Licence requirements)

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## **APPENDIX 13: Maps & Drawings**

## **APPENDIX 14: Specialist studies**

**APPENDIX 15: Proof of compliance**