

ENVIRONMENTAL MANAGEMENT PROGRAMME

(EMPr)

for the management of activities relating to the protection of the natural environment during the construction, operational and phases relating to the

THE PROPOSED AGGREGATE QUARRY AND CRUSHER PLANT OPERATIONS ON PLOT 2372, ALHEIDT NEAR KAKAMS SOUTH



JANUARY 2023

Compiled by: ***EnviroAfrica cc***

INDEPENDENCE AND CONDITIONS

EnviroAfrica is an independent consulting firm that has no interest in the proposed activity other than fair remuneration for services rendered. Remuneration for services is not linked to approval by decision making authorities and EnviroAfrica has no interest in secondary or downstream development as a result of this project. There are no circumstances that compromise the objectivity of this EMPr. The findings, results, observations and recommendations given here are based on the author's best scientific and professional knowledge and available information. EnviroAfrica reserves the right to modify aspects of this report, including the recommendations if new information becomes available which may have a significant impact on the findings of this report.

RELEVANT QUALIFICATIONS & EXPERIENCE OF THE EAP

This EMPr was compiled by Clinton Geysler who has a MSc. Degree in Environmental Management. He has been working as an Environmental Assessment Practitioner since 2009 and is currently employed at EnviroAfrica cc.

Qualifications:

- BSc. Earth Sciences, Majors in Geology and Geography and Environmental Management (1998 – 2000) and;
- BSc. (hons): Geography and Environmental Management (2001) and;
- MSc. Geography and Environmental Management (2002), all from the University of Johannesburg.

Expertise:

Clinton Geysler has over twelve years' experience in the environmental management field as an Environmental Assessment Practitioner and as an Environmental Control Officer, having worked on a variety of projects in the Western, Eastern and Northern Cape.

The whole process and report was supervised by Bernard de Witt who has more than 20 years experience in environmental management and environmental impact assessments.

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1. INTRODUCTION

The main purpose of this Environmental Management Programme (EMPr) is to prevent avoidable damage or at least minimise or mitigate unavoidable environmental damage associated with any construction, operational and decommissioning work where there is a risk of environmental damage and to enhance the positive benefits of the project. A separate Maintenance Management Plan dealing with maintenance work has also been compiled.

The EMPr forms part of the contractual obligations to which all contractors/employees involved in construction or demolition work must be committed. It serves as a guideline and baseline information document for the construction and operation 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 of 2014 (as amended) and any additional specific information requested by any State Department, including *inter alia*, the Department of Agriculture, Rural Development and Land Reform (“DEARL”) for specific projects.

This EMPr

- identifies project activities that could cause environmental damage (risks) and provides a summary of actions required;
- identifies persons responsible for ensuring compliance with the EMPr 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 EMPr;
- 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 EMPr 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 being made to the EMPr.

1.1 TERMS OF REFERENCE

EnviroAfrica cc was appointed by the Witvlei Boerdery Trust as the independent Environmental Assessment Practitioner (EAP) company to draft the EMPr. In terms of the special conditions of the contract (specifications) the EMPr must include the following:

- Details of the EAP (Refer to Page ii of this document)
- Purpose of the EMPr (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)
- EMPr operational and implementation procedures (Refer Par 5-9)
- Conclusion (Refer Par. 6)
- Annexures (Refer to Appendices)

1.2 PURPOSE OF THE EMPr

The purpose of this EMPr 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 EMPr 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 EMPr.

The overall aim of the EMPr 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 EMPr forms part of the contractual obligations to which all contractors/employees involved in construction, maintenance, or demolition work must comply. 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 the NEMA, as well as the Environmental Impact Assessment (EIA) Regulations and any additional specific information requested by any State Department, including the DEARL for specific projects.

This EMPr:

- identifies project activities that could cause environmental damage (risks) and provides a summary of actions required;
- identifies persons responsible for ensuring compliance with the EMPr;
- 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 EMPr;
- provides for monitoring of compliance and record keeping.

The EMPr 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 EMPr.

1.3 SCOPE

This EMPr addresses the construction- and operational phases and all activities associated with this project. Compliance with the EMPr 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 per month).

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

2. DEFINITIONS AND ABBREVIATIONS:

2.1 DEFINITIONS

Applicant: the organisation or responsible person from an organization who applied for the proposed activity described in the Environmental Authorisation.

Construction Supervisor: The person responsible (appointed by the owner) to ensure that the construction is carried out to completion on time, within budget and that the Contractor fulfils his obligations in terms of the EMPr.

Contractor: the principal persons / company and all other sub-contractors involved in the construction of the project.

Contractor's camp: means the designated and suitably demarcated areas on the Site within which all site offices and staff facilities are situated and within which equipment will be stored, for instance, borrow areas, batching plant, crusher plant, sand washing plant, workshop, offices, rest areas, ablution areas, etc., whichever is applicable.

Declaration of understanding: Form that is signed by all contractors involved in the construction works of their understanding and acceptance of the EMPr and site-specific additions to the EMPr.

Environment: means the surroundings within which humans exist and that are made up of:

- the land, water and atmosphere of the earth;
- micro-organisms, plant and animal life;
- any part of the combination of the above two bullets and the interrelationships between them;
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being

Environmental Aspect: Any element of the proposed mining operations that can positively or negatively interact with the environment.

Environmental Audit Report: report done by the ECO and submitted by the Applicant to the satisfaction of the competent authority, within six months of operations ending and the site being rehabilitated.

Environmental Control Officer: The ECO must be an independent and suitably qualified (a diploma or degree in environmental management with at least five or more years of environmental site management experience) and must have a sound knowledge of the environment in which the activity will take place. The ECO should be registered as an Environmental Scientist (*in terms of section 20(3) of the Natural Scientific Professions Act, 2003 (Act 27 of 2003)*).

Environmental Completion Statement: A report by the ECO to the relevant authorities stating completion of the project and compliance with the EMPr and its conditions.

Environmental Impact: Any change to the environment, whether adverse or beneficial, wholly or partially resulting from any construction activity, product or services.

Method statement: A statement by the Contractor, describing the scope of intended construction works step-by-step, in order for the ECO and Construction Supervisor to understand the Contractors intentions and be able to comment on, so that they could assist with devising mitigating measures should it be necessary to avoid environmental impact.

No-Go Area(s): An area of such (environmental/aesthetical) importance that no person or activity are allowed within a designated boundary surrounding this area.

Owner: The owner, or dedicated person, responsible for the management of the property on which the proposed activity (in terms of the EA) will be performed.

Stop Works Order: An order which can be issued either by the ECO or Construction Supervisor to the Contractor (or any sub-contractor) if serious environmental damage is about to happen or is happening as a result of construction activities. On receiving such an order the Contractor must immediately stop all activities (or planned activities) relevant to the specific issue until an environmentally friendly resolution has been approved by the ECO.

Site meetings: Periodic (weekly or monthly) meetings between the ECO, Construction Supervisor and Contractor to discuss construction activities that relate to the environment or any other environmental issues that might arise.

Works: The works to be executed in accordance with a contract.

On-site start-up meeting: a start-up meeting held on site, before any construction has begun to discuss EMPR and determine site specific additions that will be included as the basis for the EMPR.

Potentially hazardous substance: is a substance, which, in the reasonable opinion of the Engineer, can have a deleterious (detrimental) effect on the environment.

Precautionary principle: means the basic principle, that when in doubt or having insufficient or unreliable information on which to base a decision, to then undertake actions that will have minimum risk.

Reasonable: means unless the context indicates otherwise, reasonable in the opinion of the Engineer/Project Leader after he has consulted with a person, not an employee of the client, suitably experienced in "environmental implementation plans" and "environmental management plans", both as defined in the Environmental Management Act (Act No 107, 1998).

Solid waste: means all solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

2.2 ABBREVIATIONS

CARA	Conservation of Agricultural Resources Act no. 43 of 1983
DMR	Department of Minerals
DAERDLR	Department of Agriculture, Environmental Affairs, Rural Development and Land Reform
EA	Environmental Authorization issued by the competent authority for the listed activities applied for to commence under certain conditions of authorisation.
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan or Programme
ER	Engineers representative or Main contractors representative
ESO	Environmental Site Officer - . Must be a person with adequate environmental knowledge to understand and implement the EMPR by conducting onsite inspections determined by the ECO and the client.
MSDS	Material Safety Data Sheet(s)
NCNCA	Northern Cape Nature Conservation Act 9 of 2009.
NEMA	National Environmental Management Act No. 107 of 1998.
NEM:AQA	National Environmental Management: Air Quality Act 39 of 2004.
NEM:BA	National Environmental Management: Biodiversity Act 10 of 2004.
NEM:PAA	National Environmental Management: Protected Areas Act 57 of 2003
NEM:WA	National Environmental Management: Waste Act 59 of 2008.
NFA	National Forest Act 84 of 1998.
NHRA	National Heritage Resources Act 25 of 1999.
NVFFA	National Veld and Forest Fire Act 101 of 1998.
NWA	National Water Act 36 of 1998
OSSM	On-site Start-up Meeting
ROD	Record of Decision
SAHRA	South African Heritage Resources Agency

3. PROJECT LOCATION & DESCRIPTION

The Witvlei Boerdery Trust is proposing to extract granite from the granite outcrops located in the western part of Plot 2372, Alheidt by blasting. The extracted granite blocks will then be fed into a mobile crusher plant by means of front-end loaders and crushed and the resulting aggregate will be sorted according to size and stockpiled. When customers in the construction industry and building industry have ordered aggregate from the applicant, the aggregate will be loaded onto tipper trucks by front-end loader and delivered.



Figure 1: Locality map of the proposed Styr-kraal Agricultural Development.

4. APPLICABLE LEGISLATION

Constitution of the Republic of South Africa (1996): of special relevance in terms of environment is section 24

Conservation of Agricultural Resources Act 43 of 1983 (CARA): supports conservation of natural agricultural resources (soil, water, plant biodiversity) by maintaining the production potential of the land and combating/preventing erosion; for example, by controlling or eradicating declared weeds and invader plants.

Hazardous Substances Act 15 of 1973: to control substances that may cause injury, ill-health, or death through their toxic, corrosive, irritant, strongly sensitizing or flammable nature, or by the generation of pressure

National Environmental Management Act 107 of 1998 (as amended): replaced the Environmental Conservation Act (ECA) and establishes principles for decision-making on matters affecting the environment, and for matters connected therewith.

- **Environmental Impact Assessment Regulations:** identifying activities (listed activities) for which environmental authorisation must be obtained.

National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA): replaces the Atmospheric Pollution Prevention Act (No. 45 of 1965).

National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA): supports conservation of plant and animal biodiversity, including the soil and water upon which it depends.

- **National list of ecosystems that are threatened and in need of protection** (GN 1002 of 9 December 2011).

National Environmental Management: Protected Areas Act 57 of 2003 (as amended Act 31 of 2004) (NEMPAA): To provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes.

National Environmental Management: Waste Act 59 of 2008 (NEMWA): To reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.

- **List of Waste Management Activities that have, or are likely to have a detrimental effect on the environment:** Identifies activities in respect of which a waste management license is required.

National Forests Act 84 of 1998 (as amended): supports sustainable forest management and the restructuring of the forestry sector.

- **List of protected tree species** (GN 716 of 7 September 2012)

National Heritage Resources Act 25 of 1999: supports an integrated and interactive system for the management of national heritage resources, including supports soil, water and animal and plant biodiversity.

National Veld and Forest Fire Act 101 of 1998 (NVFFA): protects soil, water and plant life through the prevention and combating of veld, forest, and mountain fires

National Water Act 36 of 1998 (NWA): promotes the protection, use, development, conservation, management, and control of water resources in a sustainable and equitable manner.

Northern Cape Nature Conservation Act 9 of 2009 (NCNCA): which provides for the sustainable utilization of wild animals, aquatic biota and plants.

- Schedule 1 – 3 listing protected and specially protected species for which authorisation must be obtained if they are to be impacted upon.

5. SITE SPECIFIC ENVIRONMENTAL CONCERNS

The purpose of this section of the EMPR is to discuss possible significant environmental impacts that may be encountered. In other words, this section aims to give site specific guidance for impact minimisation in the context of the proposed development.

5.1 VEGETATION

The proposed quarry site and the new road sections will be much smaller than the area investigated during this study (the study area being approximately 6ha). The vegetation encountered in the larger study area can be described as a low grassy shrubland dominated by white grasses (after the then recent rains), with a sparse overstory of smaller woody trees and larger shrubs, located on gentle east-sloping plains. Denser and higher growing vegetation is found along the ephemeral drainage lines and watercourses.

The proposed quarry site is partially characterized by large outcrops of exfoliating granite sheets (which will be the areas targeted for mining), with relatively shallow red-yellow, freely drained apedal soils surrounding these sheets. These rocky outcrops are almost devoid of any vegetation, but the surrounding soils typically support the vegetation described above.

The Northern Cape CBA Map (2016) identifies biodiversity priority areas, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), which, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape as a whole (Holness & Oosthuysen, 2016).

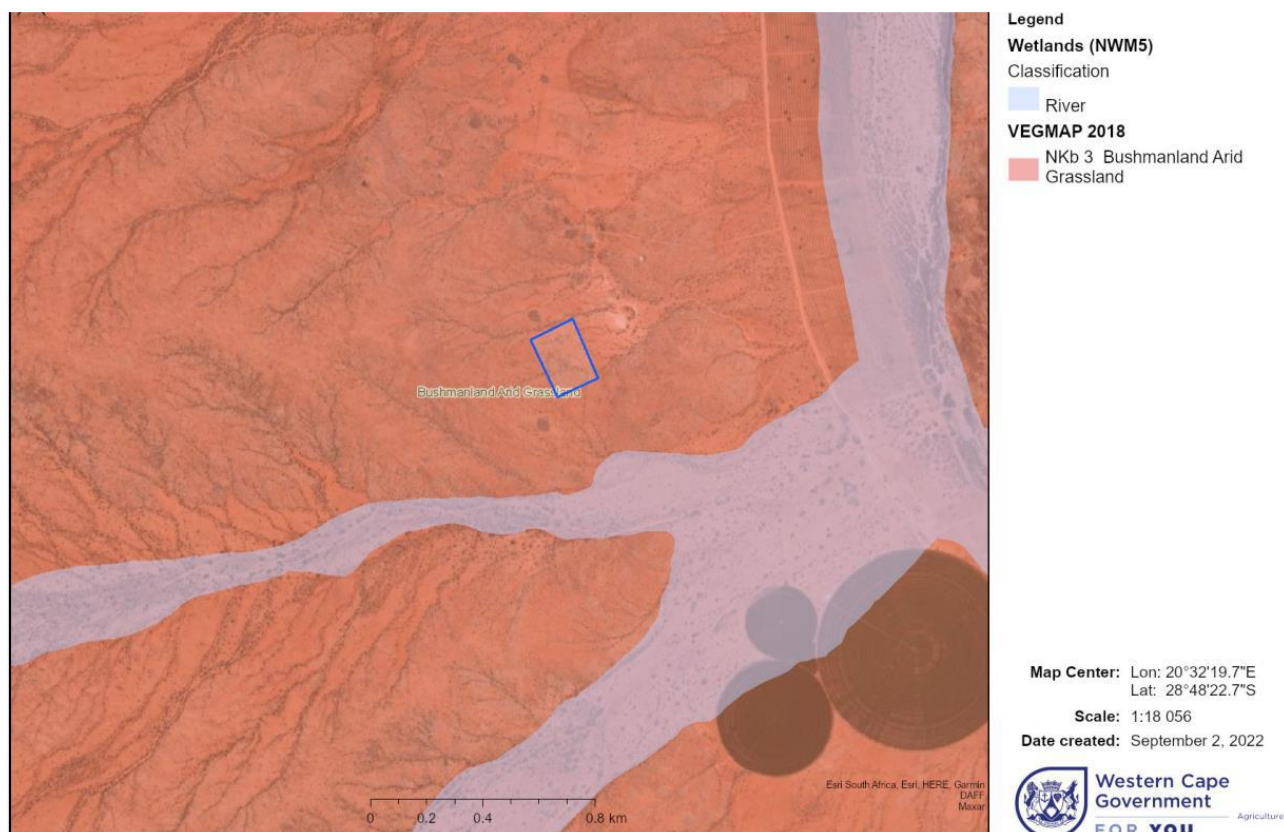


Figure 2: Vegetation of proposed site as depicted by the Vegetation Map of South Africa (2018)

According to the NCCBA the proposed site is located within a CBA and in addition, some protected plant species exist on the proposed site.



Figure 3: Map indicating on-site location of plant species protected by the NFA

The proposed aggregate quarry and crusher plant operations will have a long-term impact on the slightly less than 5ha proposed site. The vegetation of the larger footprint is still well connected towards the north and the west, although towards the south and east, intensive agriculture is practised and so connectivity is lower.

According to the Biodiversity Compliance Statement compiled for the proposed aggregate quarry and crusher plant operations, the implementation of the impact mitigation measures contained in the Biodiversity Compliance Statement should result in an environmental impact of Low rating.

5.2 FRESHWATER FEATURES

The proposed site for the aggregate quarry and crusher plant site is bordered to the north by a small drainage line and is also bordered to the south by a small drainage line. Both of the said drainage lines flow in a west to east direction. A bigger drainage line that flows in a north to south direction is located to the east of the proposed site. The larger drainage line will be crossed by the proposed access road that will lead in and out of the proposed

site of the quarry and crusher plant operations. The drainage lines flow to a sheet wash plain located up against the main road of the area and the pecan nut orchard and it is here that the three drainage lines come to an end.

The proposed quarry site is located approximately 1.3km westwards of the Hartbees River and this is too far away to significantly impact the river.

5.3 HERITAGE

Ubuque Heritage Consultants was appointed to conduct a Heritage Impact Assessment on the proposed site. The proposed development area is primarily underlain by Putsies Gneiss of the Vyfbeker Metamorphic Suite that is igneous in origin. This Suite is thus lacking in fossils.

One occurrence of a low-density surface scatter of MSA/ Early LSA (AP-004) was recorded within the development footprint. The sample size is small, without context, and of low significance; the impact is negligible.

A rocky outcrop was recorded (AP-001), and an occurrence of Stone Age material (AP-003) near the outcrop. These are outside of the development footprint. However, the outcrop and material may have possible archaeological context. This outcrop should be avoided during any mining activities.

An occurrence of a mid-20th century metal tin can (AP-002) was recorded outside of the development footprint. It is considered to be of low significance, and developmental impact is considered negligible.

6. 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 Section 7 and 8 below, the Environmental Authorisation and specialist recommendations supersede.

6.1 RECOMMENDATIONS ON IMPACT MINIMISATION

- The construction and operational phase of the project must be implemented in accordance with this EMP, the aim of which is to minimise environmental impact during all phases of the proposed development.
- A suitable qualified ECO must be appointed to oversee the construction phase.

6.1.1 Terrestrial biodiversity

The following recommendations are provided in the Biodiversity Compliance Statement:

- All construction must be done in accordance with an approved construction and operational phase Environmental Management Plan (EMP), which must include the recommendations made in this report.
- A suitably qualified Environmental Control Officer must be appointed to monitor the construction phase in terms of the EMP and any other conditions pertaining to specialist studies.
- An application must be made to the relevant authority for a flora permit in terms of the NCNCA with regards to impacts on species protected in terms of the act.
- Conservation of protected plant species (Refer to Table 4 **Photo 3** & Table 5):
- ***Vachellia erioloba*** All mature individuals must be identified and protected during the construction operational phases. The road should stay at least 1m (preferably further) away from the drip line of the canopy of each tree. All efforts should be made to minimise the impact on these trees, no matter size or general condition (Refer to Table 4).
- ***Boscia albitrunca***: All mature individuals must be marked and protected. The road and quarry site should stay at least 1m away from the drip line of the canopy of each tree (Table 4).
- Conservation of provincially protected plant species (NCNCA) (Refer to Table 5).
- The final access route must be approved by a suitable qualified (botany) ECO.
- Before any work is done the site and access routes must be clearly demarcated (with the aim at minimal width/smallest footprint). The demarcation must include the total footprint necessary to execute the work, but must aim at minimum disturbance.
- Lay-down areas or construction sites must be located within already disturbed areas or areas of low ecological value and must be pre-approved by the ECO.

- All alien invasive species within the footprint and or within 10 m of the footprint must be removed responsibly.
- Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g. spreading of the AIP due to incorrect eradication methods);
- Care must be taken to dispose of alien plant material responsibly.
- Indiscriminate clearing of any area outside of the construction footprint must be avoided.
- All areas impacted as a result of construction must be rehabilitated on completion of the project. ○ This includes the removal of all excavated material, spoil and rocks, all construction related material and all waste material.
- It also included replacing the topsoil back on top of the excavation as well as shaping the area to represent the original shape of the environment.
- An integrated waste management approach must be implemented during construction. ○ Construction related general and hazardous waste may only be disposed of at Municipal approved waste disposal sites.
- All rubble and refuse should be collected and removed from the site to a suitable registered waste disposal site.

6.1.2 Freshwater

The mitigation/control measures recommended in the Freshwater Impact Assessment are provided below together with other mitigation measures:

- Site preparation prior to construction
 - Construction work must be conducted during the dry season;
 - Vehicle re-fuelling areas and material storage facilities to remain away from drainage lines;
 - All cleared vegetation must be placed in a designated area at least 10m away from any watercourse and all cleared vegetation must be disposed of at a registered garden refuse site;
- Construction
 - Construction must remain within the demarcated footprint.
 - Prevent dust, dirt and rubble moving down the drainage lines
 - Refrain from making new roads as much as possible and use existing roads instead.
 - Conserve at least 15m riparian zone from the northern and southern drainage lines.
- Operation
 - Prevent dust, dirt and rubble moving down the drainage lines
 - Work within the demarcated footprint
 - Maintain the access road
 - Maintain a buffer area of at least 15m from the northern and southern drainage lines.
 - Prevent diesel spills, clean up any spills that do happen. Maintain spillage clean-up equipment
 - reinforce the banks of the drainage line that will be crossed by the new road by means of gabions or rip rap etc.
 - Maintain the access road to be constructed such that the road does not widen nor deepen.

- Rehabilitation and Closure
 - Prevent dust, dirt and rubble moving down the drainage lines
 - Work within the demarcated footprint
 - Monitor the drainage lines for damage and prevent deterioration of the drainage lines.

6.1.3 Heritage

If during construction, any evidence of archaeological sites or remains (e.g. remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, charcoal and ash concentrations), fossils or other categories of heritage resources are found during the proposed development, SAHRA APM Unit (Natasha Higgitt/Phillip Hine 021 462 5402) must be alerted as per section 35(3) of the NHRA. If unmarked human burials are uncovered, the SAHRA Burial Grounds and Graves (BGG) Unit (Thingahangwi Tshivhase/Mimi Seetelo 012 320 8490) must be alerted immediately as per section 36(6) of the NHRA. Depending on the nature of the finds, a professional archaeologist or palaeontologist must be contacted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required, subject to permits issued by SAHRA.

6.2 ENVIRONMENTAL AUTHORIZATION

Make changes to the EMPR as the environmental authorisation may require.

7. CONSTRUCTION PHASE EMPR

7.1 STRUCTURE AND RESPONSIBILITY

Implementation of the EMPR and environmental control and management of the construction phase will be achieved through the responsibility structure set out below. The role players include the Owner, the Construction Supervisor, the Environmental Control Officer (ECO) and the Contractor. All role players must familiarize themselves with the prescriptions of the EMPR.

7.1.1 The client / applicant / owner

The client (or the designated responsible person appointed by him) is responsible for:

- appointing a suitably experienced ECO, the Construction Supervisor and the Contractor for the duration of the construction contract, and
- ensuring that the Construction Supervisor and Contractor fulfil their obligations in terms of this EMPR.

7.1.2 The Construction Supervisor

The Construction Supervisor is responsible to ensure that construction is carried out to completion on time, within budget and that the Contractor fulfils his obligations in terms of the EMPR. In addition, the Construction Supervisor and the ECO are expected to develop a close working relationship and to stay in contact with each other.

The responsibilities of the Construction Supervisor include:

- To issue site instructions to the Contractor.
- To serve as conduit for all communication between the ECO and the Contractor [The only exception is where the ECO or the Construction Supervisor needs to issue a “**STOP WORKS**” order on the contractor if serious environmental harm is about to happen or is happening as a result of construction activity. The “**STOP WORKS**” order must be confirmed by the other party as soon as reasonably possible].
- Discussing any problems that might lead to environmental damage with the ECO.
- When the ECO is not on site the Construction Supervisor will be responsible for the implementation of the EMPR.

7.1.3 The contractor

The Contractor shall be responsible to:

- ensure that all sub-contractors, employees, suppliers, agents etc. are fully aware and adhere to the environmental conditions detailed in the EMPR;
- liaise closely with the Construction Supervisor and the ECO;
- ensure that works on the site are conducted in an environmentally sensitive manner and in full accordance with the EMPR;
- carry out instructions issued in the site instruction book;
- assist with solutions to environmental problems that may arise during the construction phase; and
- ensure that all “**No-Go**” areas are adequately fenced off.
- will report any deviation from the requirements of this EMPR to the Principal Agent, and any pollution or environmental contaminant spill events.

- agrees to work stoppage and/or payment of penalties as required by this EMPr and directed by the ECO/Construction Supervisor.
- agrees to bear full costs for any work stoppage resulting from contravention of the requirements of this EMPr, and/or the costs of remedying environmental damage resulting from their or their sub-contractors or employee's contravention of the requirements of this EMPr.

NB: All contractors must sign the "Declaration of understanding" (Appendix 1 of this document) of this EMPr before construction commences.

7.1.4 The Environmental Control Officer (ECO)

ECO will be responsible for overseeing the environmental aspects of the Construction phase and will work in close co-ordination with the Construction Supervisor.

7.1.4.1 ECO qualifications

The ECO must be independent and suitably qualified (a diploma or degree in environmental management with at least 5 or more years of environmental site management experience) and must have a sound knowledge of the environment in which the activity will take place. The ECO should be registered as an Environmental Scientist (in terms of section 20(3) of the Natural Scientific Professions Act, 2003 (Act 27 of 2003)).

7.1.4.2 ECO duties

An ECO must be appointed for the duration of the construction phase (as required by the EA). The ECO:

- will be primarily responsible for ensuring the implementation of the EMPr and will perform regular site inspections/audits with the specific aim to check for environmental conformance by the Contractor;
- to visit the site on a regular basis while construction is in progress;
- will keep environmental records (including photographs) of the construction activities;
- must ensure that "No-Go" and "Open Space" areas are adequately protected and adhered to;
- must approve and be present during the demarcation of the necessary areas for storage of materials, ablutions, eating areas of contract workers etc.;
- to conduct a start-up meeting before construction commences and will provide environmental training at the beginning of the project and will provide environmental awareness training throughout the life of the project;
- must be informed of site and technical meetings to be able to comment and report on environmental issues;
- will call for, and approve, method statements for construction activities that might pose an environmental impact and must ensure that method statements are approved before commencement of the work;
- must implement immediate mitigating action in the case of critical environmental impacts
- must deal with public complaints/queries regarding environmental issues;
- will record his findings and all environmental non-conformances in a report (which will be forwarded to the Client and the Construction Supervisor);

7.1.4.3 ECO Authority

The ECO has the authority to stop works if there is a serious threat to or impact on, the environment as a direct cause of construction. However, this authority is limited only to emergency situations where immediate consultation with the Construction Supervisor is not possible.

- The ECO is to inform the client/developer and site representative of the reasons for the stoppage as soon as possible. A relevant reason should be supplied as soon as possible after stoppage of such works.
- Upon failure by the contractor or his employee to show adequate consideration to the environmental aspects of this contract *i.e.* wilful destruction of the environment, the ECO may recommend to the client/developer or site representative to have the contractor's representative or any employee(s) removed from the site or work suspended until the matter is remedied.
- No extension of time will be considered in the case of such suspensions and all costs will be borne by the contractor

7.1.5 Health and Safety officer:

A health & safety (H&S) officer for the project must be designated or appointed by the Contractor or Principal Agent, and his/her role is to support the successful implementation of the EMPr through:

- Site evaluation on a regular basis.
- Identifying issues relating to day to day construction activities and that can have a detrimental effect on the environment.
- Subcontractor audits to ensure compliance.
- Assist in the direct implementation of the EMPr.
- Ensure that the requirements of the EMPr are communicated understood by personnel on site *via* induction sessions.
- Ensure that the contractors on site develop, implement and monitor the required H&S management functions.
- Evaluate the applicability and accuracy of the EMPr and the method statements throughout the construction phase.
- Coordinate all statutory requirements including permit authorisation and license requirements.
- Conduct or have conducted a hazard analysis and take the necessary corrective action.
- Where it is not possible to remove any remaining hazard's to inform employees thereof and what precautionary action is to be taken.
- Detail mitigation measures required to be taken, and the procedures for their implementation to the project manager.
- Representing H&S issues at the production meetings.
- Coordinate H&S training of personnel.
- Coordinating spill response personnel.
- The H&S officer shall inspect the integrity of the hazardous waste containers/bins/skips on a weekly basis.

7.1.5.1 Health & Safety Officer qualifications

The Health and Safety Officer must be independent and suitably qualified, with a sound knowledge of the Occupational Health & Safety Act (Act no. 85 of 1993), and must have experience in the implementation of the act with regards to the construction and environmental environments in which the activity will take place.

7.2 COMMENCEMENT OF WORKS

The site project contractors must timeously receive a copy of the construction phase EMPr (CEMPr) and any other additional information that pertains to site conditions/amendments or deviations from original site plan.

- This EMPr must be included as part of the Contractors site specification documentation.
- A copy of the EMPr must be on site at all times and available for presentation to any authority requesting to see such document.

NO WORK ON SITE MAY TAKE PLACE UNTIL

- The Declaration of Understanding/Environmental Contract is signed between the relevant parties.
- One week's written notice given to the competent authority before commencement of any construction activity (As per EA).
- On-Site Start-Up Meeting has been held
- Site and No-Go areas has been identified **and demarcated**.
- Contractors are in possession of the EMPr and other relevant documentation
- Contractors/Sub contractors have signed the Declaration Of Understanding
- All mandatory site equipment is in place
- On Site Environmental Education & Awareness training session has taken place with all relevant construction personnel present.

NB: Work refers to: Camp Establishment, Earthmoving activities and any pre-limitory construction activities.

7.3 ISSUES OF CONCERN

Issues of concern that were identified in the Environmental Impact Assessment process and included in the EA must be addressed during the "On Site Start-Up Meeting" and must be included in the On-Site Start-Up Report. Issues of Concern include but shall not be limited or restricted to the following:

- No-go areas
- Waste management and disposal;
- Mandatory site equipment;
- Establishment of construction site;
- Soil erosion control; and
- Use and storing of hazardous substances;

7.4 SITE SPECIFIC ARRANGEMENTS & CONSTRUCTION PROCEDURES

It is imperative that all construction works be undertaken during the dry months to limit the amount of sediment washed down drainage lines.

7.4.1 On-site start-up meeting

The mandatory **On-Site Start-Up Meeting** must be conducted prior to commencement of any site/camp establishment, earthworks and/or construction activities and will focus on site specific conditions and requirements that may be applicable to the project and may require additional or special measures of control.

On-Site Start-Up Meeting points of discussion are:

- The Construction EMPr & other relevant site documents
- Project to be discussed and all uncertainties are cleared
- Method statement/s to be discussed
- Road construction area to be demarcated
- Materials stockpile and lay down areas to be demarcated
- Method of stockpiling to be discussed
- Firefighting procedures
- Mandatory firefighting equipment & fire preventative measures
- Solid waste removal intentions
- Placement, type and service of toilets to be agreed on
- Placement and type of rubbish bins and removal of rubbish to be agreed on
- Labour camp to be demarcated and services agreed on
- Environmental Education and awareness training session to all contractors & onsite staff/labour.

7.4.2 Start-up meeting participants

Minutes of the onsite Start-Up Meeting will be condensed to a report format and circulated to all attendees of the meeting for their perusal and comment. The on-site Start-up Meeting report will form part of this EMPr. If any discrepancies between the start-up report and the EMPr arise then the EMPr will take precedence until clarification on the discrepancy is clarified. If any discrepancies between the EMPr and the EA arise, then the EA will take precedence until clarification on the discrepancy is clarified.

Participants to the start-up meeting can include:

- Applicants Representative.
- Main Contractor's Representative.
- Resident Engineer
- Site foreman.
- Environmental Consultant.
- Environmental Control Officer.

NB: It is the responsibility of the main contractors to ensure that all sub- contractors, that work on the site are informed of the environmental conditions pertaining to the site.

7.5 ENVIRONMENTAL AWARENESS TRAINING

7.5.1 Environmental awareness course

Environmental awareness training shall be provided for all personnel on site. The ECO will be responsible for the initial awareness course which shall include all relevant management, the Construction Supervisor, the Contractor and all foremen. All attendees shall remain for the duration of the course.

The Contractor shall be responsible for ensuring that all his personnel and subcontractors (if applicable) are informed and made aware of the environmental constraints and shall also supply the ECO with a monthly report indicating the number of employees used by him. If refresher courses are deemed necessary, for instance, where personnel disregard the requirements of the EMPr, the time lost and the cost of the course will be for the account of the Contractor.

7.5.2 Specific training

All contractors and workers shall be informed about any special habitat, biodiversity feature, vegetation and/or rare plant species that might be present on the specific construction site (if applicable).

7.6 METHOD STATEMENTS

Method statements from the contractor will be required for specific sensitive actions on request of the authorities, the Applicant or ECO.

A method statement forms the base line information on which sensitive area work takes place and is a “live document” in that modifications are negotiated between the Contractor and ECO/applicant, as circumstances unfold.

All method statements will form part of the EMPr documentation and are subject to all terms and conditions contained within the EMPr main document.

These documents must be available to the authorities for inspection or on request.

A method statement describes the scope of the intended work in a step-by-step description in order for the ECO and Applicant to understand the contractor’s intentions. This will enable them to assist in devising any mitigation measures, which would minimize environmental impact during these tasks.

The Contractor must submit the method statement before any particular construction activity is due to start. Work may not commence until the ECO and applicant have approved the method statement.

Method statements need to be compiled by the contractor for approval by Applicant and the ECO. The contractor must submit written method statements to Applicant for the purposes of the environmental specification, a “Method Statement” is defined as a written submission by the contractor to Applicant setting out the plant, materials, labour and method the contractor proposes using to carry out an activity, in such detail that Applicant and the ECO is able to assess whether the contractor’s proposal is in accordance with the specifications and/ or will produce results in accordance with specifications.

The method statement must cover applicable details with regard to:

- Construction procedures
- Materials and equipment to be used
- Moving the equipment to and from site
- How the equipment/ material will be moved while on site
- How and where material will be stored
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material (of any potential hazardous material) that may occur
- Timing and location of activities
- Compliance/ non-compliance with the Specifications, and
- Any other information deemed necessary by the Applicant and the ECO

The Contractor must abide by these approved method statements, and any activity covered by a method statement must not commence until Applicant and the ECO has approved of such method Statement.

NB: No work may commence or take place before the Method Statement has been approved by all relevant parties. List of possible Method statements include but shall not be limited or restricted to:

- Demarcation, including no-go areas
- Entrance and haul roads
- Traffic management plan
- A traffic management plan for the site access roads.
- A transportation plan for the transport of larger components.
- A storm water management plan.
- An erosion management plan.
- Clearing of vegetation & topsoil removal
- Stockpiling
- Temporary storage facilities
- Construction camp & site offices
- Fuel storage
- Dust control
- Noise control
- Rehabilitation

7.6.1 Additional method statements

Any additional method statements (with regards to a specific aspect of construction) that may be required must be **submitted** and approved before commencement of the specific works and must be available at the site offices.

7.7 NON-COMPLIANCE

Applicant (on recommendation by the ECO) reserves the right at all times for the duration of this agreement to impose restrictions and associated penalties on the contractor with respect to the specific nature, timing and extent of construction activities on environmentally sensitive sites.

7.7.1 Corrective action instruction

The ECO may issue an on-site corrective action instruction to the site agent, or, by means of an entry into the Site Instruction Register for remedial work to be carried out to rectify any non-compliance that has been carried out within a reasonable agreeable timeframe to carry out and complete the remedial work.

7.7.2 Written warning

In instances of non-compliance with the EMPr by the contractor (or any of their employees) or sub-contractor/s (or any of their employees) that move on or off the site, the onsite ECO must issue a written warning indicating the non-conformance to the contractor.

If repeated instructions by the ECO to the site agent to respond to the corrective action instruction are not been carried out, the ECO can issue a Written Warning notation instructing the site agent to timeously carry out the corrective measures as per the original non-compliance.

7.7.3 Penalty fines

In the event of the site agent negligence to respond and correct the noted non-compliance the ECO may in collaboration with the relevant parties recommend that a Penalty Fine be imposed on the contractor.

- The applicant, in consultation with the ECO must determine the amount of the penalty applicable in accordance with the Penalties for Non-Compliance Schedule of Tariffs.
- Such penalty amount must be in writing and presented to the contractor within seven (7) days of the written warning.
- Applicant may recover penalties by deducting the fine from the offending contractor.
- The contractor will be responsible for all costs incurred where emergency procedures are implemented to deal with accidents impacting on the environment as well as the rehabilitation of such damage in conjunction with the ECO and site engineer.
- In serious cases, at the discretion of Applicant and the Environmental Consultant/ECO, any multiple offences can be added together.

7.7.4 Stoppage of works

The ECO (after consultation with Environmental Consultant/Applicant/Engineer) may also stop the works or part thereof until the situation is resolved; no extension of time is claimable by the contractor.

These penalties do not preclude any prosecution under any law or regulation.

7.8 CHANGES TO EMPR

Although care has been taken to address all known relevant environmental issues for the construction phase, it may become necessary to add or amend certain procedures or instructions to improve the efficiency of the EMPr.

- Only those additions or amendments of this EMPr that will either improve environmental protection or can be proved not to have any negative effect to the immediate and surrounding environment will be considered.
- Changes or deviations have to be motivated in writing by means of a Method Statement and the same procedures for a standard Method Statement have to be followed.
- Any additions or amendments must be submitted by the ECO to the competent authority (if so requested) after the ECO has consulted with the Environmental Consultant and Applicant.
- No deviation from the contents of the EMPr is allowed without following the above procedures.

7.9 RECORD KEEPING

All records relating to the implementation of this EMPr must be kept together, be readily retrievable and available for scrutiny by any relevant authority. Records include the following:

- Declarations of understanding;
- ECO Checklist, audits and/or diary;
- Method statements
- Photographs (must be taken before, during and immediately after construction as a visual reference);

7.10 STANDARD MANAGEMENT PROCEDURES

7.10.1 Access & haul routes

The Contractor must control all access (vehicles and plant) to and from the construction site, including that of his suppliers so that they remain on the pre-approved designated routes. In addition such vehicles and plant must be so routed and operated so as to minimise disruption to regular users of the routes.

- Where heavy duty vehicles and construction plant are required, both the type of vehicles/machinery and the area/s these are to access shall be specified in a Method Statement.
- Access routes/haul roads will utilise only existing roads or tracks, unless such routes are not available or new routes are to be constructed as part of the project, in which case a Method Statement must be submitted for the construction of any new access/ haul roads (including temporary routes).
- No new roads or tracks may be created except where such routes are specifically approved by the ECO, in the EA or in this EMPr.
- Access roads/haul roads must be designed so as to minimise erosion.
- All vehicles and access to the site must remain within demarcated access routes and working areas on site.
- On gravel or earth roads on site, the vehicles of the Contractor and his suppliers may not exceed the speed of 25 km/hr.
- On public roads adjacent to the site vehicles will adhere to municipal and provincial traffic regulations.
- All temporary access routes must be rehabilitated at the end of the contract to the satisfaction of the ECO.

If so required by the owner of the land the following may also apply with regard to access and vehicular movement on site:

- All Contractors, subcontractors and staff shall be identified by clothing with company logos and be in possession of valid identity documents.
- Deliveries, removals etc. to be completed during normal working hours (unless otherwise agreed upon by the Construction Supervisor).
- No personnel shall stay permanently on site, unless permission to stay on site is provided as part of the construction contract.
- Access routes must be demarcated by orange twine/danger tape on steel posts or temporary fencing.
- The Contractor shall at his own cost, document the existing condition of each access road prior to commencement.
- Should any damage occur to the access road as a result of the upgrade activities, the road will be rehabilitated to its original state with all costs borne by the contractor.

7.10.2 Appropriate use of machinery

The Contractor must at all times carefully consider what machinery is appropriate to the task while minimizing the extent of environmental damage.

- The contractor may not operate any machinery outside the demarcated area.
- All vehicles and equipment must be routinely inspected for fuel and oil leaks and kept in good working order and serviced regularly. Leaking equipment must be repaired immediately or removed from the Site. When servicing equipment, drip trays must be used to collect the waste oil and other lubricants. Drip trays must also be provided in construction areas for stationary plant (such as compressors) and

- for "parked" plant (such as scrapers, loaders, vehicles). Drip trays will be kept free of water that will float the oil to overspill. All drip trays / bungs to attain a 120% capacity of the plant fuel / oil capacity.
- Where practical, all maintenance of plant and machinery on Site must be performed in workshops. If it is necessary to do maintenance outside of a workshop area, the Contractor must obtain the approval of the ECO prior to commencing activities.
 - Appropriate 2.5 kg (minimum requirement) dry powder SABS approved and service certified firefighting extinguisher must be a mandatory item on each vehicle working and moving on or off the construction site.
 - The servicing, repairs and maintenance of all construction machinery must take place at the designated service and maintenance area and not along the proposed new road construction route.

7.10.3 "No-Go" areas

Specifications of the EA, the EMPr or the on Site Start-Up Meeting (OSSM) can require that certain areas be set aside as "No go" areas as a result of their environmental significance or proximity to significant environmental features.

- No-Go areas will be demarcated and indicated on a site plan.
- All natural areas outside of the development area are to be considered "no-go areas".
- A Method Statement is to be submitted to the ECO by the Contractor, detailing the method of fencing for protection of such conservation areas.
- No-Go areas are out of bounds to the Contractor and his staff, sub-contractors and their staff or suppliers and their staff or any other person involved in the project, without the written permission specified by the ECO.
- The Contractor must ensure that, insofar as he has the authority, no person, machinery, equipment or material enters the designated "No Go" areas at any time.
- All contractors must be made aware of the importance of these features and the consequences of non-compliance.

7.10.4 Restriction of working areas

The approved layout plans will be used to establish the site demarcation (footprint). All relevant parties responsible for the day-to-day activities on the site will be present and made aware of the implication of the site demarcation. They include the:

- Environmental Consultant: EnviroAfrica
- Principle Agent
- Main Contractor: Project Site Manager
- Sub-contractor: Project contractor
- ECO: Environmental Control Officer

The proposed site will be demarcated prior to the commencement of any construction whatsoever, this includes site establishment, the moving of construction material or any other items onto the site, etc.

- The site will be demarcated with appropriate dropper poles. A single strand of orange baler twine is to be attached to the dropper poles to indicate boundaries and no-go areas for site personnel and vehicular movement. (Alternative fencing may be decided upon dependent on site requirements).

- The construction area i.e. road, stockpile areas and development footprint etc. must be demarcated and fenced off with dropper poles and orange baler twine approximately 1m high is considered adequate. **The demarcation will be agreed on during the start-up meeting.**
- All fencing and fence placement / positioning must be approved by the ECO on site.
- Work areas and access routes must be clearly demarcated to minimise environmental impact.
- In the event that sensitive features are threatened by construction activities, temporary fencing off of these areas (for individual areas such as trees or rocks) or the construction area (when working in a mainly natural environment) is recommended.
- NB: Also note the requirements discussed under the following paragraphs: 7.10.5; 7.10.6; 7.10.2; 7.10.9; 7.10.7; 7.10.8.
- The Contractor must maintain in good order all demarcation, fencing and barriers for the duration of construction activities, or as otherwise instructed.
- Demarcation may not be moved, re-located or altered or changed without the approval of the ECO.
- Any temporary fencing removed for the execution of any portion of the works is to be reinstated by the Contractor as soon as practicable.

7.10.5 Protection of natural veld

Habitat fragmentation is usually defined as a landscape-scale process involving both habitat loss and the breaking apart of habitat. Habitat loss has large, consistently negative effects on biodiversity. Habitat fragmentation per se has much lower effects on biodiversity, but could be just as negative. As such the construction activities must endeavour to minimise its impact on any remaining natural features and natural corridors.

- All remaining natural corridors identified as significant biodiversity features during the environmental assessment stage, must be mapped and identified as “No-Go” areas on the site plans and protective measures must be installed (demarcated);
- Except to the extent necessary for the carrying out of the works, no flora may be removed, damaged or disturbed;
- Trapping, poisoning and/or shooting of animals is strictly forbidden. No domestic pets or livestock are permitted on Site;
- The Contractor may not deface, paint, damage or mark any natural features, if these should occur (e.g. trees, rock formations, buildings, etc.) situated in or around the Site for survey or other purposes unless agreed beforehand with the ECO. Any features affected by the Contractor in contravention of this clause must be restored/rehabilitated to the satisfaction of the ECO.
- All incidents of harm to any animal or natural vegetation (apart from the agreed upon areas) must be reported to the ECO.

7.10.6 Protection of flora

Please also refer to the specific recommendations in Section 6.2 above.

- The areas of vegetation that are to be protected during construction must be demarcated and indicated as “No-Go” areas on a site plan. Include the area under the canopy of trees so that tree roots will not be damaged by soil compaction.
- Also refer to the requirements of the rehabilitation and restoration guidelines (Refer to paragraph **Error! Reference source not found.**).

7.10.7 Protection of fauna and Avi-fauna

Trapping, poisoning and/or killing of animals is strictly forbidden. No domestic pets or livestock are permitted on Site. Many slow moving animals, local amphibians and other species follow instinctive movements along roadside corridors where they travel from place to place.

- Every effort must be implemented on a daily on-going basis by the contractor to ensure that the construction areas have been checked for any animals and to ensure their removal and protection from direct and in-direct impacts during the construction activities.
- The removal of fauna from the site must be done in accordance with the requirements of the Nature Conservation Ordinance regulating these activities.
- Environmental corridors and “No-Go” areas must be demarcated and protected.

7.10.8 Clearing of vegetation, stripping & conservation of topsoil

The contractor shall take all reasonable steps to minimise the impact of his activities on the environment. If natural vegetation has to be removed for construction purposes, the natural vegetation shall be rescued, re-used in such a way that it enhances the remaining natural veld. By the same principle topsoil (which contains the remaining natural seed store as well as possibly many bulb species) must be carefully removed and stored or re-used for rehabilitation or impacted areas in the immediate vicinity.

Vegetation clearing:

- A Method Statement must be submitted detailing the methods to be used for vegetation clearing.
- All cleared areas must be stabilised as soon as possible.
- Burning of cleared vegetation on site is prohibited.
- The burying of cleared vegetation or use thereof for backfilling or landscape shaping is prohibited unless written approval is obtained from the ECO.
- Should bulk vegetation be removed from the designated working areas (footprint area) then tall vegetation shall first be removed.

Topsoil removal

- Prior to any activities within the demarcated work areas, topsoil material shall be removed to a depth of 300mm or deeper in consultation with the ECO, and stockpiled in a designated area for use in rehabilitation of the site.
- Any area where the topsoil will be impacted by construction activities, must have the topsoil stripped and covered with herbaceous vegetation (other than alien species), overlying grass and other fine organic matter and stockpiled for subsequent use in rehabilitation.
- Topsoil storage areas must be convex and should not exceed 2 m in height. The Contractor must ensure that the material does not blow or wash away.
- Topsoil must be treated with care, must not be buried or in any other way be rendered unsuitable for further use (e.g. by mixing with spoil) and precautions must be taken to prevent unnecessary handling and compaction.
- In particular, topsoil must not be subject to compaction greater than 1 500 kg/m² and must not be pushed by a bulldozer for more than 50 m. Trucks may not be driven over the stockpiles.
- Topsoil from different soil types must be stockpiled separately and replaced in the same areas from which they were taken if this proves to be the case. Specific attention should be given to the areas that may house rare and threatened species.
- Topsoil areas must be demarcated in order to ensure the safekeeping of topsoil and to separate different stockpile types.

- Remove and stockpile topsoil and subsoil separately
- Stockpile topsoil within an area where no stormwater runoff is envisaged.

Reestablishment of topsoil

- Rip compacted areas, manually, within the immediate vicinity of the construction footprint to a depth of approximately 300mm and cover with topsoil and seed with *Cynodon dactylon*. The use of fertilizers and other chemical soil enhancers should be avoided.

7.10.9 Erosion & sedimentation control

The Contractor must take appropriate on-going and active measures to prevent erosion resulting from his own construction activities and operations as well as stormwater control measures to the satisfaction of the ECO. During construction the Contractor must protect areas susceptible to erosion by installing all the necessary temporary and permanent drainage works as soon as possible.

In order to achieve erosion and sediment control, the following are applicable to all sites:

- Install erosion and sediment controls before work starts and maintain these features throughout the construction and operational phases (as applicable).
- Leave as much vegetation as possible.
- Install temporary fences to define “No Go” areas in those areas that are not to be disturbed.
- Inspect and maintain erosion and sediment controls regularly.
- Save and re-use topsoil during re-vegetation. Never store topsoil around trees as this may kill them.
- Store all stockpiles and building materials behind sediment fences. Cover them with plastic to prevent erosion by wind.

7.10.10 Alien invasive management plan

In accordance with Regulation 15 and 16 of the Conservation of Agricultural Resources Act, 1983 (Act no. 43 of 1983) (CARA) as amended, all listed alien invasive plant species must be managed on any land in SA. As such an alien invasive management plan may have to be implemented during construction and operational phases of the project. If such a plan is required, it must include mitigation measures to reduce the invasion of alien species and ensure that the removal of alien species is undertaken.

The invader status of the various invasive alien species in South Africa is described in accordance with Regulation 15 and 16 of the Conservation of Agricultural Resources Act, 1983 (Act no. 43 of 1983) (CARA) as amended (the 3 categories and its control are summarised underneath).

Category 1 (Declared Weed)

- Prohibited on any land or water surface in South Africa
- Must be controlled or eradicated (except in biological control reserves).

Category 2 (Declared Invader – commercial value)

- Allowed only in demarcated areas under controlled conditions
- Outside of controlled areas invaders must be controlled or eradicated where possible
- Prohibited within 30 m off the 1:50 year flood line of watercourses or wetlands unless authorization has been obtained

Category 3 (Plant Invaders – ornamental value)

- Allowed only in areas where they were already in existence with the promulgation of the regulations.
- Prohibited within 30 m of the 1:50 year flood line of watercourses or wetlands unless authorization has been obtained.
- All reasonable steps must be taken to ensure that they do not spread.
- Propagative materials of these plants (e.g. seeds or cuttings) may no longer be planted, propagated, imported, bought, sold or traded in any way.

7.10.11 Protection of archaeological & paleontological remains

Archaeological remains are ancient man-made objects, structures, or ancient burials that have been preserved on the earth's surface, underground, or underwater and serve as the historical sources that make it possible to reconstruct the history of human society, including mankind's prehistory. Palaeontology or Palaeontology, on the other hand, is the study of prehistoric life. It includes the study of fossils to determine organisms' evolution and interactions with each other and their environments (their paleoecology). Palaeontology lays on the border between biology and geology, and shares with archaeology a border that is difficult to define. No specific recommendations are given, however, the following is to be noted:

- Basic archaeological remains include work tools, weapons, domestic utensils, clothing, and ornaments; settlements including campsites, fortified and unfortified settlements, and separate dwellings; ancient fortifications; the remains of ancient hydraulic structures; ancient agricultural fields; roads; mining pits and workshops; ancient burial grounds and various burial and religious structures (stelae, stone figurines, stone fish monoliths (vishaps), menhirs, cromlechs, dolmens, sanctuaries); drawings and inscriptions carved into individual stones and cliffs; and architectural monuments. Archaeological remains also include ancient ships and their cargoes that sank in rivers and seas and settlements that came to be underwater as a result of shifts in the earth's crust
- Should any unmarked human burials/remains or ostrich eggshell water flask caches be uncovered, or exposed during construction activities, these must immediately be reported to the ECO and Heritage Western Cape (HWC) for information on the appropriate course of action to be taken. Burials, etc. must not be removed or disturbed until inspected by an archaeologist or without written approval from SAHRA.
- Should any substantial fossil remains (e.g. vertebrate bones and teeth, shells, petrified wood) be encountered during excavation, these should be reported to SAHRA for possible mitigation by a professional palaeontologist.
- Note that the Contractor may not, without a permit issued by the responsible heritage resource authority; destroy, damage, excavate, alter, deface or otherwise disturb any archaeological site or archaeological material. The latter is a criminal offence under the Heritage Resources Act.

7.10.12 Storage of construction material & stockpiling

New construction material will be stored in demarcated areas on the affected property prior to commencement of construction. The Contractor must provide a method statement (for approval by the ECO) of the construction activities which will indicate:

- the type and quantity of material to be stored;
- whether any oil contaminated/containing equipment will be stored;

- how (including what type of vehicles will be required) it will be deliver the material on site at the necessary storage area; and
- whether there is any risk of spill or runoff of any building materials or chemicals and how this is to be mitigated.

In addition:

- The Contractor must ensure that any delivery drivers are informed of all procedures and restrictions (including "no go" areas) required to comply with the Specifications. The Contractor must ensure that these delivery drivers are supervised during off-loading, by someone with adequate understanding of the requirements of the Specifications.
- All manufactured and/or imported material must be stored within the demarcated area, and, if so required, out of the rain. All lay down areas outside of the construction camp must be subject to the Engineer and the ECO's approval in such a way as not to cause a nuisance or environmental damage.
- It is essential that any imported material i.e. base material for road works, building sand, bedding base sand for pipe / cable lines etc. be screened and the origins thereof must be identified prior to arriving at the receiving environment, this must be approved by the ECO.
- Special care must be taken to prevent the bringing in of materials contaminated with seed of Invasive Alien Plants. Contractors shall not import construction materials such as sand, gravel or fill contaminated with seed of Invasive Alien Plants, or quarried from areas surrounded by Invasive Alien plant species such as Port Jackson or Rooikrans.
- The Contractor must negotiate appropriate space on site for this purpose on an area away from natural vegetation and drainage lines with the ECO.
- The Contractor must ensure that all staff, contractors and subcontractors are aware of and keep material within these designated storage areas. The Construction Supervisor shall ensure that the consultant team is familiar with same.
- Contractors will not be allowed to store new construction material on the sides of the access road, or on natural vegetation.
- Also refer to the traffic- and transportation management plans and their requirements.

7.10.13 Oil storage and management

An important potential environmental impact is oil spills from any oil filled equipment and machinery that may occur during transportation or storage of decommissioned and new construction material/ equipment. The following conditions shall apply:

- Vehicles must be checked for oil leaks prior to going on site
- Care should be taken to prevent any potential oil spillage during upgrading activities.
- Sufficient measures should be put in place to ensure that any potential oil spills are mitigated.
- An oil spill kit should be available on site at all times during the construction activities;
- Oil containment facilities should be provided for any oil filled equipment onsite;
- All oil spills must be reported to the ECO within 24 hours, indicating the containment and rehabilitation measures implemented

Oil spill kits are available from:

- Drizit (021) 531 5335
- Enretech (021) 683 1858
- Pinelands Environmental Technology (021) 531 3749

7.10.14 Storing of petroleum products

It is important to know that petroleum fuels contain harmful substances that cause health problems and can easily have adverse effects on water quality, and the environment. Petroleum spills can move rapidly into the soil and quickly contaminate watercourses. In order to prevent pollution it is important to, use proper methods when handling, using, and storing diesel fuel, gasoline, kerosene, or other petroleum products.

The South African National Standards pertaining to the installation of a storage tank include:

- Sans 310, which requires that an aboveground storage tank be of sufficient structural strength, based on sound engineering practices, to withstand normal operations and use;
- Sans 1668, for fibre-reinforced plastic tanks for the underground storage of petroleum products;
- Sans 10089-1, which deals with the storage and distribution of petroleum products in aboveground bulk installations; and
- Sans 1535, for glass- reinforced polyester-coated steel tanks, for the underground storage of hydrocarbons and oxygenated solvents, which are intended to be buried horizontally.

Above ground fuel storage tanks (not recommended, but if required)

Any fuel storage proposals must be cleared by the ECO before any storage or stockpiling takes place. If the contractor proposes to install above-ground fuel storage tanks for use during the construction phase of the project, the following basic requirements must be adhered to:

- A Method Statement, explaining the method of storage and mitigation measures to prevent spillages must be submitted to the ECO and accepted prior to the installation of such a fuel storage facility (please note that storage of any dangerous goods/fuel of 30 cubic meters or more require environmental authorisation).
- The fuel tank must be placed within a completely sealed concrete bund (containment structure) which must be able to contain at least 120% of the total capacity of the fuel tank.
- The banded area should be built to be at least a third wider (on all sides) than the base of the fuel tank in order to maximise its capability to contain spillages and leakages.
- The fuel distributor must also be located within banded area to better prevent against accidental spillages during refuelling.
- In addition, drip trays are to be used during refuelling.
- All vehicles, equipment, fuel and petroleum services and containers must be maintained in a good condition that prevents leakage and possible contamination of soil or water supplies.
- Fuel storage areas must comply with general fire safety requirements.
- Fuel storage areas must be at least 100m from any watercourses.

Storing of smaller quantities of fuel or oil

Any fuel storage proposals must be cleared by the ECO before any storage or stockpiling takes place. If the contractor proposes to use only small fuel storage facilities (< 200 litres) the following basic requirements must be adhered to:

- Fuels and oils must be safely located out of harm's way from the elements and safety and fire prevention must be strictly adhered to.
- All fuel oil containers must be placed within suitable drip trays to prevent accidental spillage of oils and fuels.

- A suitable leak proof container for the storage of oiled equipment (filters, drip tray contents and oil changes etc.) must be established.
- All spills are to be recorded in the ECO diary.

7.10.15 Storing of hazardous substances

It is important to understand how potentially hazardous substances are to be stored on site, the Contractor must submit a Method Statement detailing the substances and/or materials to be used, together with the storage, handling and disposal procedures of the materials to the ECO.

- Hazardous materials must be stored under lock and key in designated areas with properly displayed and visible warning signs.
- No works related to the submitted Method Statement may commence until the Method Statement has been studied and approved in writing.
- An effective monitoring system to detect any leakage or spillage of all hazardous substances during their transportation, handling, use and storage must be implemented. This must include precautionary measures to limit the possibility of oil and other toxic liquids from entering the soil or storm water systems.
- Measures to protect hydrological features such as streams, rivers, pans, wetlands, dams and their catchments, and other environmentally sensitive areas from construction impacts including the direct or indirect spillage of pollutants must be implemented.
- **Paints:** - No paint products may be disposed of on Site and brush/roller wash facilities must be established to the satisfaction of the Engineer and the ECO. Oil based paints and chemical additives and cleaners such as thinners and turpentine must be strictly controlled. A Method Statement detailing the paint management procedures is required.
- **Hazardous building materials:** -Hazardous building materials (e.g. asbestos, fibre claddings, refrigerants, coolants, sub-station cooling oils, etc.) must be identified and dealt with in accordance with the relevant safety and health legislation. All such material must be separated on Site and disposed of at appropriate licensed disposal sites. The Contractor must supply the ECO with a certificate of disposal.

7.10.16 Blasting / drilling

In the event where blasting or rock drilling is required, the following must be implemented:

- A Method statement must be provided for each case separately **prior** to commencement of blasting works.
- The contractor must take all necessary precautions to prevent damage to special features and the general environment, which includes the removal of fly rock.
- The contractor must ensure that no pollution results from drilling operations, either as a result of oil and fuel drips, or from drilling fluid. The contractor must take all reasonable measures to limit dust generation as a result of drilling operations.
- The ECO must be given 24-hour notice before blasting events.

7.10.17 Fire fighting

Adequate firefighting equipment according to the fire hazard during the construction period must be available on site and in good working order (at least one type ABC (all purpose) 4.5 kg extinguisher and 3 fire beaters per working area). The persons on site must be trained in the use of such equipment.

- The main contractor must provide a list of all authorities involved in firefighting in the region. This list must include emergency contact numbers and must be visible at the site office.
- Welding, gas cutting or cutting of metal will only be permitted inside the working areas.
- The Contractor must pay the costs incurred to organizations called to put out any fires started by him. The Contractor must also pay any costs incurred to reinstate burnt areas as deemed necessary by the land owner.
- It is required that contractors have available the emergency telephone numbers of the nearest local Fire Fighting Station and that an emergency firefighting re-action plan has been drawn up with onsite workers and the resident land-owner / farmer.

7.10.18 Emergency Procedures

It is the responsibility of the contractor to assess the potential risks to the environment as a result of the project. As such, the contractor must have the necessary standard emergency operating procedures in place to deal with any potential emergency such as oil spills or fire.

- All staff should be made aware of the necessary basic emergency procedures in the event of an emergency including injuries to staff. The appropriate equipment and identified personnel to deal with such basic emergencies should be available on site.
- **Fire:** The Contractor must advise the relevant authority of a fire as soon as one starts and must not wait until he can no longer control it. The Contractor must ensure that his employees are aware of the procedure to be followed in the event of a fire.
- **Hazardous Material Spills:** The Contractor must ensure that his employees are aware of the procedure to be followed for dealing with spills and leaks, which must include notifying the Engineer, the ECO and the relevant authorities. Treatment and remediation of the spill areas must be undertaken to the reasonable satisfaction of the ECO and Local Authority.

7.10.19 Solid waste management

Waste refers to all solid waste, including domestic waste, hazardous waste and construction debris. The Contractor is responsible for the establishment of a refuse control system (which must consider recycling wherever possible) that is acceptable to the ECO. Disposal arrangements must be made in advance and cleared with the ECO before construction starts.

- No littering or on-site burying or dumping of any waste materials, vegetation, litter or refuse may occur.
- All solid waste must be disposed of offsite at an approved landfill site in terms of section 20 of the Environment Conservation Act (Act No. 73 of 1989). The Contractor must supply the ECO with a certificate of disposal.
- The Contractor must provide problem animal- and weatherproof bins with lids of sufficient number and capacity to store the solid waste produced on a daily basis. The lids must be kept firmly on the bins at all times. Bins must not be allowed to become overfull and must be emptied regularly.
- Waste from bins may be temporarily stored on Site in a central waste area that is weatherproof and scavenger proof and which the Engineer and the ECO has approved.
- All hazardous waste must be disposed of at a registered hazardous waste disposal site and certificates of safe disposal must be obtained.
- All waste generated during construction activities must be removed by the Contractor as soon as possible, and within the period specified in the EMPr and disposed of at a lawful landfill site.

- The Contractor must make provision for workers to clean up the Contractor's camp and working areas on a daily basis so that no litter is left lying around and so that the site is in a neat and tidy state. The Contractor must remove from site the refuse collected at least once a week.

7.10.20 Toilets & Ablution Facilities

The Contractor must provide suitable sanitary arrangements on the construction site for the employees.

- Toilets must be away from watercourses.
- The toilet must be within easy reach (max 300m) of the working area and be in good working condition and cleaned on a daily basis. Toilet paper must be provided. The toilets must be emptied on a weekly basis or when full or when instructed by the ECO on site.
- Disposal arrangements must be made in advance and cleared with the ECO before construction starts. Sanitation provision and servicing must be to the satisfaction of the ECO.
- The Contractor must ensure that toilets are emptied prior to any builders' holidays, and/or weekends.
- Toilets must be kept in a neat condition and must be provided with doors and locks and must be secured to prevent them from blowing over.
- No burying of any waste material on or near the construction site nor anywhere on the surrounding property is permitted.
- Eating areas that are allocated for workers must be established in an environmentally acceptable manner and in line with all OH & Safety Act regulations. All on site and on route workers temporary eating areas must be acceptable toilet and refuse management systems put in place and these areas must have suitable refuse receptacles' available for the containment and disposal of general litter and refuse.

7.10.21 Treating (flushing / testing) of pipelines

Cleaning/sterilization/flushing of pipelines shall not impair surrounding environmental quality.

- Any contaminated water from such activities shall be contained until it complies with the standards contained in the National Water Act or other relevant Acts, as well as those laid down by the Local Authority.
- Alternatively, it shall be removed from site and disposed of at an approved waste disposal site.

7.10.22 Eating facilities

The Contractor must designate eating areas for the approval of the ECO, which must be clearly demarcated. No eating of meals must take place outside these designated areas without the approval of the Contractor/ESO.

- The feeding or leaving behind of food for animals is strictly prohibited.
- Sufficient waste bins must be present in this area and emptied regularly.
- No overnight camping/stay on site allowed. If staying overnight is necessary for security purposes then it must be cleared with the ECO on site.
- No washing in watercourses is allowed.

7.10.23 Dust Control

The Contractor must take all reasonable measures to minimize the generation of dust as a result of construction activities (but must also take into account possible water restrictions in the area).

- The onsite construction site agent must take into account prevailing wind strength and wind direction and must have preventative measures on standby to minimize dust pollution.

7.10.24 Land Management

- No fences or gates on the relevant construction property must be damaged. All access gates to the property (construction site) to be kept closed at all times to prevent domestic and or wild animals from getting out. Access by unauthorised personnel should be prevented.

7.10.25 Socio-Cultural Issues

- Neighbouring community, adjacent landowners and occupiers etc. must be treated with respect and courtesy at all times.
- Hours of work on the site shall be limited to normal working hours, as accepted by the local authority.
- Should construction be required outside of these times, permission must be obtained from the local municipality, in consultation with the ECO and the surrounding landowners.

7.11 EMERGENCY PREPAREDNESS & RESPONSE

The following potential emergency situations have been identified and include the procedure for responding to, and for preventing and mitigating the environmental impacts that may be associated with them (also refer to Penalties and Fines).

7.11.1 Accidental fires

No fires are permitted on site for any reason. If required, a designated smoking area will be provided, and clearly demarcated and signposted, with a facility for safe containment and disposal of cigarette butts.

The following measures must be implemented:

- Adequate firefighting equipment must remain available on site and in good working order (including at least one type ABC (all purpose) 4.5 kg fire extinguisher and 3 fire beaters per working area). The persons on site must be trained in the use of such equipment.
- The main contractor must provide a list of all authorities involved in firefighting in the region. This list must include emergency contact numbers and must be visible at the site office.
- The contractors must establish an emergency procedure (with contact numbers) to the satisfaction of ECO (whenever work is done in any fire prone areas).

7.11.2 Hydrocarbon spills

The following must be observed:

- Vehicles must arrive on site already fuelled for the project.

- If additional fuel is needed, it will be brought in as needed (minimal volumes) and refuelling will be done using a pump and not a funnel (to minimize the risk of spills).
- Spill trays shall be used during re-fuelling.
- In the case of accidental spillages or leakage, the contractor will be responsible for immediate containment and corrective action (e.g. stopping the leakage), and to inform the Construction Supervisor and ECO.
- The ECO will recommend the best possible environmental solution.
- The Contractor will be liable for any costs incurred.

8. OPERATIONAL EMPR (OEMPR)

The most important part of the operational phase will be to ensure that the site is meticulously maintained and that the granite extraction and crusher plant operations are carefully monitored. The applicant will remain overall responsible for the environmental performance of the site and must be aware of the legal requirements and obligations. The applicant must also be aware of the legal action that can be taken against him as a person with regards to negligence that causes environmental damage.

The owner or delegated responsible person must implement an operational management plan which must include:

- Access management and control;
- Energy management and monitoring;
- Water management and monitoring;
- Erosion management;
- Waste and pollution management;
- Fire Management;
- Minimise dust and air emissions;
- Protection of indigenous natural vegetation and fauna;
- Specific monitoring and operational instructions;
- Emergency plans which will cover all reasonable aspects of the operations which might lead to environmental pollution or degradation.

8.1 TRAFFIC ACCESS ROUTES & HAUL ROADS

The Operator of the site must control the movement of all vehicles and plant including that of his suppliers so that they remain on designated routes. In addition such vehicles and plant must be routed and operated so as to minimise disruption to regular users of the routes.

- The vehicles of the Contractor when on the site and his suppliers must not exceed a speed of 25 km/h.
- On public roads adjacent to the Site, vehicles must adhere to municipal and provincial traffic regulations.
- Only approved access roads may be used.
- All measures must be implemented to minimize impacts on local commuters e.g. limiting construction vehicles travelling on public roadways during the morning and late afternoon commute time and avoid using roads through densely populated built-up areas so as not to disturb existing retail and commercial operations.

8.2 WATER MANAGEMENT

- Ensure that all relevant water uses are correctly registered with the National Department of Water and Sanitation (e.g. Agri-industrial use).
- Every reasonable effort must be made to reduce the long term water demand.
- Environmental training of personnel must include water conservation awareness.

8.3 EROSION & SEDIMENT CONTROL

Soil erosion (through wind & water) removes valuable topsoil which is the most productive part of the soil profile (containing plant nutrients, seeds and bulbs). Development disturbs and loosens soils which can easily lead to erosion. The plants and animals that depended on that soil can no longer survive, and the plants that once grew that cannot re-establish themselves because the seed bank is gone. Soil may then have to be brought from elsewhere, increasing the cost of the project and the risk of importing weeds and other waste or toxic material. In accordance with the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA), the aim of erosion management is to prevent any form of soil erosion through proactive thinking and prevention as well as immediate rehabilitation.

In order to achieve erosion and sediment control, the following are applicable to all properties:

- Inspect and maintain erosion and sediment controls on a regular basis and ensure that they can accommodate the upslope catchment situation.
- Leave as much vegetation as possible.
- Install permanent fences to define 'no go' areas in those areas that are not to be disturbed.
- Install sediment catchment controls down slope of the site to catch sediment (if applicable).
- Limit vehicle movement to the site and control access points. Clearly mark such access points and inform all suppliers.

8.4 WASTE & POLLUTION MANAGEMENT

An integrated waste management approach based on waste minimisation (e.g. reduction, recycling, re-use and disposal) must be implemented. Poor waste management can lead to adverse environmental impacts (e.g. odours, pollution and visual impact) as well as health risks. Sound waste management is therefore required.

- No on-site burying or dumping of any waste materials, vegetation, litter or refuse is allowed.
- Domestic waste must be stored in approved containers (e.g. bins with removable lids).
- All solid waste will be disposed of at a landfill licensed in terms of section 20 of the Environment Conservation Act (Act No. 73 of 1989).

8.4.1 Recycling

Whenever possible, a suitable recycle arrangement must be negotiated with a local recycle agent to ensure the re-use of recyclable material. Recycling should aim to sort as much of the following materials as practical:

- Paper and cardboard
- Aluminium
- Copper
- Metals (other than aluminium and copper)

- Glass
- Organic waste
- Batteries
- Electronic equipment

8.5 FIRE MANAGEMENT

Refer to emergency preparedness and response paragraph 8.8.

8.6 MINIMISE DUST AND AIR EMISSIONS

Refer to erosion control in Paragraph 8.3.

8.7 MANAGEMENT OF NATURAL AREAS

The objective regarding the management of natural areas is to identify critical or conservation worthy features and to manage such areas and gardens in such a manner as to promote biodiversity and ecological processes.

- Natural areas must be managed to remain as close to natural as possible (no interference wherever possible).
- All listed invasive alien vegetation must be removed in accordance with CARA legislation (The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)) as revised.

8.8 EMERGENCY PREPAREDNESS AND RESPONSE

The following potential emergency situations have been identified and include the procedure for responding to, and for preventing and mitigating the environmental impacts that may be associated with them.

8.8.1 Accidental fires

Fire safety in Fynbos Area is a very real risk and must be stringently controlled. No fires will be permitted on site for any reason. If required, a designated smoking area will be provided, and clearly demarcated and signposted, with a facility for safe containment and disposal of cigarette butts.

The following measures must be implemented:

- Adequate firefighting equipment must be available on site and in good working order (including at least one type ABC (all purpose) 4.5 kg fire extinguisher and 3 fire beaters per working area). The persons on site must be trained in the use of such equipment.
- The main contractor must provide a list of all authorities involved in firefighting in the region. This list must include emergency contact numbers and must be visible at the site office.
- The contractors must establish an emergency procedure (with contact numbers) to the satisfaction of ECO.

8.8.2 Hydrocarbon spills

Since the project is in proportion relative small, no fuel storage or distribution facilities will be established. As a result the significance of any spill is much reduced. The following must be observed:

- Vehicles will arrive on site already fuelled for the project. If additional fuel is needed, it will be brought in as needed (minimal volumes) and refuelling will be done using a pump and not a funnel (to minimize the risk of spills). Spill trays shall be used during re-fuelling.
- In the case of accidental spillages or leakage, the client will be responsible for immediate containment and corrective action (e.g. stopping the leakage) and will be liable for any costs incurred.

8.9 MAINTENANCE

Control measures applicable to this activity would be as per Construction and Operation above.

9. ENVIRONMENTAL AUDIT PROGRAMME

A Final Construction Phase Audit Report is to be undertaken six months post construction. This must be undertaken by a qualified Independent Environmental Auditor, and is to be submitted to the Competent Authority.

Since the development includes an operational phase, annual audits for the initial two years are recommended.

In terms of the 2014 EIA Regulations, Audit Reports must be submitted to the registered I&APs within seven days of submission to the competent authority.

10. IMPACT MANAGEMENT OUTCOMES

Impact Management Outcomes

Planning, Design and Pre-Construction					
Impact	Management Outcomes	Management Actions	Responsible Person/Party	Implementation Monitoring Method	Monitoring Frequency
Demarcation of work areas	Prevent impacts on undisturbed areas and natural vegetation	<ul style="list-style-type: none"> The site will be demarcated with appropriate dropper poles. Alternative fencing may be decided upon dependent on site requirements). Other demarcation measures can be used if approved by the ECO Work areas and access routes must be clearly demarcated to minimise environmental impact 	Owner / Contractor	Method Statement	Once-off
Demarcation of no-go areas	Prevent impacts on sensitive features on site, such as natural vegetation on or adjacent to the site	<ul style="list-style-type: none"> No-Go areas will be demarcated and indicated on a site plan Natural vegetation outside of the development area will be considered no-go areas, unless for the purpose of alien vegetation clearing. 	Owner / Contractor	Method Statement	Once-off
Site camp establishment and access roads	Prevent unnecessary impacts on natural vegetation through the establishment and operations of the site camp and access roads.	<p>The site camp, lay down areas, and access roads must be clearly defined on a plan, taking no-go areas into consideration, as well as proximity to drainage lines.</p> <ul style="list-style-type: none"> All cleared vegetation must be stored in a designated area. Once all clearing activities has commenced all material must be disposed 	Owner / Contractor	Method Statement	Once-off

		of at a registered garden refuse site and may not be burned or mulched on site.			
Fuel Storage	Prevention of fuel spillages and contamination of the soil and/or water resources	<ul style="list-style-type: none"> • The fuel tank must be placed within a <u>completely sealed concrete bund</u> • All fuel oil containers must be placed within suitable drip trays to prevent accidental spillage of oils and fuels. • A suitable leak proof container for the storage of oiled equipment (filters, drip tray contents and oil changes etc.) must be established. • Fuel storage areas must be kept away from watercourses. 	Owner / Contractor	Method Statement	Once-off
Mandatory site equipment	Ensure the correct equipment is on site to meet environmental requirements as per the EMPr	<ul style="list-style-type: none"> • Adequate fire fighting equipment must be available on site and in good working order (including at least one type ABC (all purpose) minimum 4.5 kg fire extinguisher and 3 fire beaters per working area • Drip trays to be used during refuelling or storage of small quantities of fuel on site • Adequate toilet and ablution facilities must be provided on site. Toilets should be kept away from watercourses. Toilets are to be serviced and cleaned on a regular basis • Adequate waste bins to be provided on site 	Owner / Contractor	Method Statement	Once-off
Waste Management	To prevent and minimise waste generation and contamination of the site and surrounding areas	<ul style="list-style-type: none"> • No littering or on-site burying or dumping of any waste materials, vegetation, litter or refuse may occur. • All solid waste, except for the organic waste from the removed vineyards and natural vegetation, must be disposed of offsite at a lawful landfill site in terms of section 20 of the Environment Conservation Act (Act No. 73 of 	Owner / Contractor	Method Statement	Once-off

		<p>1989). The Contractor must supply the ECO with a certificate of disposal.</p> <ul style="list-style-type: none"> • The Contractor must provide problem animal- and weatherproof bins with lids of sufficient number and capacity to store the solid waste produced on a daily basis. The lids must be kept firmly on the bins at all times. Bins must not be allowed to become overfull and must be emptied regularly. 			
Fire Management	Prevent unnecessary fires which may cause damage and risk to the environment, property and human health, and adequately deal with any fires that may occur on site	<ul style="list-style-type: none"> • Adequate fire fighting equipment according to the fire hazard during the construction period must be available on site and in good working order (at least one type ABC (all purpose) minimum 4.5 kg extinguisher and 3 fire beaters per working area). The persons on site must be trained in the use of such equipment. • The main contractor must provide a list of all authorities involved in firefighting in the region. This list must include emergency contact numbers and must be visible at the site office. • No on site fires are permitted. 	Owner / Contractor	Method Statement	Once-off

Construction

Impact	Management Outcomes	Management Actions	Responsible Person/Party	Implementation Monitoring Method	Monitoring Frequency
Topsoil removal	Topsoil to be removed (if necessary), protected and stockpiled for rehabilitation upon closure	<ul style="list-style-type: none"> • Prior to any activities within the demarcated work areas, topsoil material shall be removed to a depth of 300 mm or deeper if specified by the engineer in consultation with the ECO, and stockpiled in a designated area for use in rehabilitation of the site post construction. • Topsoil from the relatively natural area (the top 15 -20 cm) should be removed and be used for rehabilitation after upon closure of the site. 	Owner / Contractor	Method Statement	Once-off
Stockpile Management	Avoid impacts on natural areas and watercourses	<ul style="list-style-type: none"> • Topsoil stockpiles to be separated from waste, building material etc. stockpiles 	Owner / Contractor	Method Statement	Once-off

	from stockpiling of material, waste etc.	<ul style="list-style-type: none"> • Stockpile areas to be demarcated prior to construction 			
Erosion Management	Prevent erosion as a result of construction activities on site	<ul style="list-style-type: none"> • Install erosion and sediment controls before work starts and maintain these features throughout the construction and operational phases • Leave as much vegetation as possible. • Implement the Stormwater Management Plan. Adherence to the EMPr & Implementation of Standard Management Procedures in terms of erosion and sedimentation 	Owner / Contractor	Method Statement	Once-off
Dust Control	Prevent and minimise dust generation on site in order to prevent nuisance to neighbouring land owners and residents, as well as being a health risk	<ul style="list-style-type: none"> • The Contractor must take all reasonable measures to minimize the generation of dust as a result of construction (but must also take into account possible water restrictions of the area). • The onsite construction site agent must take into account prevailing wind strength and wind direction and must have preventative measures on standby to minimize dust pollution that may cause damage to people and property. • The generation of dust into the surrounding environment shall be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. The speed of vehicles must be strictly controlled to prevent dangerous conditions, excessive dust or excessive deterioration of the road being used. 	Owner / Contractor	Method Statement	Daily

Operation					
Impact	Management Outcomes	Management Actions	Responsible Person/Party	Monitoring Method	Monitoring Frequency
Wildlife and trespasser casualties	Limit the number of wild animals and trespassers that may fall into the pit where granite has been mined out	Maintain a wall of boulders and a fence of small diameter mesh around the pit to hinder wildlife and any trespasser from reaching the pit	Applicant	Method statement	Daily
Dust Control	Prevent and minimise dust generation on site in order to prevent nuisance to neighbouring land owners as well as being a health risk	<ul style="list-style-type: none"> The Contractor must take all reasonable measures to minimize the generation of dust as a result of construction (but must also take into account possible water restrictions of the area). The onsite construction site agent must take into account prevailing wind strength and wind direction and must have preventative measures on standby to minimize dust pollution that may cause damage to people and property. <p>The generation of dust into the surrounding environment shall be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents. The speed of vehicles must be strictly controlled to prevent dangerous conditions, excessive dust or excessive deterioration of the road being used.</p>	Applicant	Method Statement	Daily
Drainage lines protection	Limit disturbance that granite extraction and crusher plant operations can cause to drainage lines	<ul style="list-style-type: none"> Maintain a 15m wide buffer area between the northern and southern drainage lines and the aggregate quarry and crusher plant operations Maintain the access road Prevent diesel spills, clean up any spills that do happen. Maintain spillage clean-up equipment 			

		<ul style="list-style-type: none">• reinforce the banks of the drainage line that will be crossed by the new road by means of gabions or rip rap etc.• Maintain the access road to be constructed such that the road does not widen nor deepen			
--	--	---	--	--	--

Rehabilitation

Impact	Management Outcomes	Management Actions	Responsible Person/Party	Monitoring Method	Monitoring Frequency
Rehabilitation of the aggregate quarry and crusher plant operations site	Rehabilitation of areas impacted by the aggregate quarry and crusher plant operations	<ul style="list-style-type: none"> • All structures, equipment, materials and facilities used or created on site for the aggregate quarry and crusher plant operations are removed once the project has been completed. On completion of the project or phase, all areas impacted must be reinstated and/or rehabilitated to the satisfaction of the ECO. • Replacement of topsoil material – care must be taken to return topsoil to the same place that the topsoil came from. 	Owner / Contractor	Method Statement	Once-off

APPENDIX 1: DECLARATION OF UNDERSTANDING

DECLARATION OF UNDERSTANDING

PROPOSED AGGREGATE QUARRY AND CRUSHER PLANT OPERATIONS DEVELOPMENT

PLOT 2372, ALHEIDT NEAR KAKAMAS

I _____

Representing: _____

Declare that the conditions of the EMPr was brought to my attention and that I have read and understood the contents of this Environmental Management Plan and that a copy of this EMPr 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

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. Humans make use of natural resources and this 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 (EMPr) are implemented not only to protect vegetation or tortoises 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 (EMPs) do? What does this mean for my contract?

EMPrs 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 (EA) 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.

A WORD ON METHOD STATEMENTS:

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.

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).

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.

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 results in environmental damage, the contractor is responsible for the cost of rehabilitation/clean-up/etc.

...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

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

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 teëgekomp 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.

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*
PRE-CONSTRUCTION PHASE		
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
CONSTRUCTION PHASE		
Information		
A copy of the EMP & environmental authorisation with all the conditions of approval, and the relevant Method Statements must be on-site at all times.	200	5000
Construction crew behaviour		

Construction crews may not spend the night on site.	200	5000
No loud 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
Toilets		
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
Fire Prevention		
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
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

Waste control		
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
Herbicides		
No herbicides or pesticides whatsoever may be used.	200	2000
Road		
Road to be constructed must be maintained, especially where the road crosses the large drainage line located eastwards of the proposed site	500	5000
Soil Stabilisation		
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
Rehabilitation		
Remove all plants that can be used for rehabilitation and store in appropriate manner as agreed with ECO	200	5000
Removal of all rubble and alien materials from site	500	5000
Site must be cleared of all waste	500	5000

*(Large scale / repeated offence)

APPENDIX 6: INFO ON METHOD STATEMENTS

INFORMATION ON METHOD STATEMENT

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>1. DEMARCATION</p> <p>Boundaries of “no go” areas, construction sites, -offices, temporary storage areas must be demarcated (EMP and ECO requirements) and maintained for the length of the construction period.</p>		
<p>2. NO-GO AREAS</p> <p>Identified “No-Go Areas”, must be demarcated for protection from construction damage (including secondary impact).</p> <ul style="list-style-type: none"> • 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. • Special attention to identified areas with significant vegetation. 		
<p>3. SEARCH & RESCUE</p> <p>All flora identified for search & rescue must be removed before any commencement of works and should be re-used in pre-approved way.</p>		
<p>4. VEGETATION & TOPSOIL REMOVAL</p> <p>Before any commencement of works, topsoil must be stripped (>150mm) and stockpiled for rehabilitation/ landscaping. Stockpiles:</p> <ul style="list-style-type: none"> • must be protected (erosion) and stored separately. • may not be moved further than 50m or mixed with any other soil. • must be convex and should not exceed 2m in height. <p>In addition:</p> <ul style="list-style-type: none"> • Cleared areas must be stabilized. • Burning or burying of cleared vegetation is prohibited (may be used for mulch or slope stabilisation on site). 		
<p>5. SITE OFFICE</p> <p>Must be demarcated, organised and free of day-to-day litter (good housekeeping standards).</p>		

ENVIRONMENTAL ASPECT	RATING	FINDINGS & RECOMMENDATIONS
RATING: 1 = EXTREMELY POOR 2 = POOR 3 = AVERAGE 4 = GOOD 5 = EXCELLENT		
<p>6. ENTRANCE AND HAUL ROADS</p> <p>Only approved entrance and haul roads may be used. No new roads or parking areas may be developed without written approval from the ECO.</p>		
<p>7. MANDATORY SITE EQUIPMENT</p> <p>Mandatory site equipment must be in place, well maintained and in accordance with EMP and ECO requirements.</p> <ul style="list-style-type: none"> • Sufficient refuse bins, well placed and cleaned regularly. • Sufficient fire extinguishers, readily available, maintained and functional. • Drip trays must be used at all fuel and oil storage and refuelling sites. • Toilets and sanitation facilities must be kept clean neat and hygienic. 		
<p>8. FUEL STORAGE</p> <p>Fuel storage areas must be situated within the an area approved by the ECO).</p> <ul style="list-style-type: none"> • Larger containers must be bunded (containment of accidental spillages). • Drip trays must be used during refuelling or under stationary refuelling vehicles. • Fuel and oil storage and refuelling sites must be maintained. 		
<p>9. WASTE CONTROL</p> <ul style="list-style-type: none"> • Waste management must be in accordance with the EMP 		
<p>10. VEHICLE AND PLANT MAINTENANCE</p> <p>Construction vehicles must be in good working order and well maintained to prevent oil and fuel leakages and to reduce noise levels.</p>		
<p>11. HEAVY EARTHMOVING EQUIPMENT</p> <p>Earthmoving vehicles and equipment may only operate <u>within</u> the demarcated areas of the proposed site.</p>		
<p>12. DUST CONTROL</p> <p>Adequate dust control measures must be in place to prevent nuisance or pollution (entrance-, haul roads and exposed surfaces).</p> <ul style="list-style-type: none"> • Areas of concern must be watered regularly during construction AND periods of strong winds, BUT must take water saving into account. 		
<p>13. EROSION CONTROL</p> <p>Erosion resulting from works must be controlled.</p>		

ENVIRONMENTAL ASPECT	RATING	FINDINGS & RECOMMENDATIONS
RATING:	1 = EXTREMELY POOR 2 = POOR	3 = AVERAGE 4 = GOOD 5 = EXCELLENT
<ul style="list-style-type: none"> • Temporary and permanent drainage areas must be maintained. • Erosion damage and damage in drainage courses must be reinstated. 		
14. NOISE CONTROL Effective noise control measures must be in place and acceptable working hours must be kept (deviations must be approval by the ECO).		
15. ARCHAEOLOGICAL & HERITAGE FINDS 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 and SAHRA.		
16. METHOD STATEMENTS Method statements must be submitted and approved before commencement of the works. Possibly Required: <ol style="list-style-type: none"> 1. Demarcation & No-Go Areas (Map) 2. Clearing of vegetation & topsoil conservation 3. Stockpiling & temporary storage 4. site offices 5. Mandatory site equipment 6. Fuel storage 7. Entrance & haul roads 8. Waste management 9. Dust control 10. Erosion control 11. Noise control 12. Rehabilitation Additional Method Statements		
17. ENVIRONMENTAL CONDUCT Environmental conduct of 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).		
18. ENVIRONMENTAL CHECKLIST 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.		
19. REHABILITATION On completion of the project or phase, all areas impacted by the quarry and crusher plant activities must be reinstated and/or		

ENVIRONMENTAL ASPECT	RATING	FINDINGS & RECOMMENDATIONS
RATING: 1 = EXTREMELY POOR 2 = POOR 3 = AVERAGE 4 = GOOD 5 = EXCELLENT		
<p>rehabilitated to the satisfaction of the ECO with emphasis on the following:</p> <ul style="list-style-type: none"> • Site offices must be removed and the areas rehabilitated or reinstated to the satisfaction of the ECO. • All temporary fencing and demarcation must be removed and the areas reinstated to the satisfaction of the ECO. • Temporary storage areas must be rehabilitated or reinstated to the satisfaction of the ECO. • All quarry and crusher plant material that is not for maintaining safety and security must be removed and the areas rehabilitated or reinstated to the satisfaction of the ECO. • Any additional disturbed areas must be rehabilitated or reinstated to the satisfaction of the ECO. 		
<p>20. SPOT FINES & PENALTIES</p> <p>Spot fines and penalties must be recorded and documented by the ECO (in accordance with the EMP).</p>		
<p>21. FIXED POINT PHOTOS</p> <p>Photographs must be taken by the ECO, and or Site Manager, prior to, during and immediately after commencement of works as visual reference. These photographs must be stored with other records relating to the EMPr.</p>		

ECO COMMENTS

End of report

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:	<input type="checkbox"/> FIRST OFFENCE	<input type="checkbox"/> SECOND OFFENCE	<input type="checkbox"/> 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	Site offices						
6	Fuel storage						
7	Entrance and haul roads						
8	Mandatory site equipment						
9	Waste management/control						
10	Cement mixing and batching areas						
11	Construction vehicle maintenance						
12	Dust control						
13	Erosion control						
14	Noise control						
15	Archaeological and heritage finds						
16	Rehabilitation						
17							

18	Additional MS (Waste Licence requirements)						
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							

APPENDIX 13: Maps & Drawings

APPENDIX 14: Specialist studies

APPENDIX 15: Proof of compliance