

## **APPENDIX F – ORIGINAL EMP (TSWELOPELE ENVIRONMENTAL)**

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# ENVIRONMENTAL MANAGEMENT PLAN (EMP)

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## CSIR Satellite Applications Centre

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### CSIR Satellite Applications Centre

**Submitted to:**  
**GAUTENG DEPARTMENT OF AGRICULTURE & RURAL DEVELOPMENT**  
GAUT 002/09-10/N0227

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**DATE: March 2010**

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- DECLARATION OF UNDERSTANDING BY THE CONTRACTOR.
- METHOD STATEMENT
- ECO / ENGINEER DECLARATION FOR METHOD STATEMENTS
- ENVIRONMENTAL INCIDENTS.

## ABREVIATIONS

DEA.....	Department of Environmental Affairs
DWA.....	Department of Water Affairs and Forestry
EA.....	Environmental Authorisation
EAP.....	Environmental Assessment Practitioner
ECO.....	Environmental Control Officer
EIA.....	Environmental Impact Assessment
EMP.....	Environmental Management Plan
EO.....	Environmental Officer
ESO.....	Environmental Site Officer
I&AP.....	Interested and Affected Parties

## DEFINITIONS

**Alternative** - A possible course of action, in place of another, that would meet the same purpose and need defined by the development proposal. Alternatives considered in the EIA process can include location and/or routing alternatives, layout alternatives, process and/or design alternatives, scheduling alternatives or input alternatives.

**Aspect** - Element of an organisation's activities, products or services that can interact with the environment.

**Auditing** - A systematic, documented, periodic and objective evaluation of how well the environmental management plan is being implemented and is performing with the aim of helping to safeguard the environment by: facilitating management control which would include meeting regulatory requirements. Results of the audit help the organisation to improve its environmental policies and management systems.

**Built environment** - Physical surroundings created by human activity, e.g. buildings, houses, roads, bridges and harbours.

**Conservation** - Protecting, using and saving resources wisely, especially the biodiversity found in an area.

**Contamination** - Polluting or making something impure.

**Corrective (or remedial) action** - Response required addressing an environmental problem that is in conflict with the requirements of the EMP. The need for corrective action may be determined through monitoring, audits or management review.

**Degradation** - The lowering of the quality of the environment through human activities, e.g. river degradation, soil degradation.

**Environment** - Our surroundings, including living and non-living elements, e.g. land, soil, plants, animals, air, water and humans. The environment also refers to our social and economic surroundings, and our effect on our surroundings.

**Environmental Impact Assessment (EIA)** - An Environmental Impact Assessment (EIA) refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of a proposed development. The EIA includes an evaluation of alternatives; recommendations for appropriate management actions for minimising or avoiding negative impacts and for enhancing positive impacts; as well as proposed monitoring measures.

**Environmental Management System (EMS)** - Environmental Management Systems (EMS) provide guidance on how to manage the environmental impacts of activities, products and services. They detail the organisational structure, responsibilities, practices, procedures, processes and resources for environmental management. The ISO14001 EMS standard has been developed by the International Standards Organisation.

**Environmental policy** - Statement of intent and principles in relation to overall environmental performance, providing a framework for the setting of objectives and targets.

**Habitat** - The physical environment that is home to plants and animals in an area, and where they live, feed and reproduce.

**Hazardous waste** - Waste, even in small amounts, that can cause damage to plants, animals, their habitat and the well-being of human beings, e.g. waste from factories, detergents, pesticides, hydrocarbons, etc.

**Impact** - A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

**Indigenous species** - Plants and animals that are naturally found in an area.

**Infrastructure** - The network of facilities and services that are needed for economic activities, e.g. roads, electricity, water, sewerage.

**Integrated** - Mixing or combining all useful information and factors into a joint or unified whole. See Integrated Environmental Management.

**Integrated Environmental Management (IEM)** - A way of managing the environment by including environmental factors in all stages of development. This includes thinking about physical, social, cultural and economic factors and consulting with all the people affected by the proposed developments. Also called "IEM".

**Land use** - The use of land for human activities, e.g. residential, commercial, industrial use.

**Mitigation** - Measures designed to avoid, reduce or remedy adverse impacts

**Natural environment** - Our physical surroundings, including plants and animals, when they are unspoiled by human activities.

**Policy** - A set of aims, guidelines and procedures to help you make decisions and manage an organisation or structure. Policies are based on people's values and goals. See Integrated Metropolitan Environmental Policy.

**Process** - Development usually happens through a process - a number of planned steps or stages.

**Proponent** – Entity which applies for environmental approval and is ultimately accountable for compliance to conditions stipulated in the Environmental authorisation (EA) and requirements of the EMP.

**Recycling** - Collecting, cleaning and re-using materials.

**Resources** - Parts of our natural environment that we use and protect, e.g. land, forests, water, wildlife, and minerals.

**Stakeholders** - A subgroup of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term includes the proponent, authorities and all interested and affected parties.

**Storm water management** – Strategies implemented to control the surface flow of storm water such that erosion, sedimentation and pollution of surface and ground water resources in the immediate and surrounding environments are mitigated. This is specifically important during the construction and decommissioning phases of a project.

**Sustainable development** - Development that is planned to meet the needs of present and future generations, e.g. the need for basic environmental, social and economic services. Sustainable development includes using and maintaining resources responsibly.

**Waste Management** – Classifying, recycling, treatment and disposal of waste generated during construction and decommissioning activities.

**Wetlands** - An area of land with water mostly at or near the surface, resulting in a waterlogged habitat containing characteristic vegetation species and soil types e.g. vleis, swamps.

## **REFERENCES**

DEAT (1992) Integrated Environmental Management Guideline Series, Volumes 1-6, Department of Environmental Affairs, Pretoria.

DEAT (2004a) Environmental Management Plans, Integrated Environmental Management, Information Series 12, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

CITY OF CAPE TOWN: ENVIRONMENTAL MANAGEMENT PROGRAMME (2002) Specification EM – 02/07: ENVIRONMENTAL MANAGEMENT, Ver 5 (03/2002)

Lochner, P. 2005. Guideline for Environmental Management Plans. CSIR Report No ENV-S-C 2005-053 H. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town.

National Environmental Management Act 107 of 1998 (NEMA)

## SECTION 1: INTRODUCTION AND BACKGROUND

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### 1.1 INTRODUCTION

Tswelopele Environmental (Pty) Ltd, as an independent environmental managers and impact assessors, has been appointed by CSIR to compile and submit a Environmental Management Plan (EMP) to the decision making authority; Gauteng Department of Agriculture and Rural Development (GDARD) for the development and installation of satellite antennae at the CSIR Satellite application Centre on Farm Hartebeesthoek 502 JQ, Gauteng Province.

This document is compiled in accordance with the Integrated Environmental Management (IEM) philosophy which aims to achieve a desirable balance between conservation and development (DEAT, 1992). IEM is a key instrument of the National Environmental Management Act [NEMA] (Act No. 107 of 1998). NEMA promotes the integrated environmental management of activities that may have a significant effect on the environment, while IEM prescribes a methodology for ensuring that environmental management principles are fully integrated into all stages of the development process. It advocates the use of several environmental management tools that are appropriate for the various levels of decision-making. One such tool is an Environmental Management Plan (EMP).

The IEM guidelines intend encouraging a pro-active approach to sourcing, collating and presenting information in a manner that can be interpreted at all levels. The basic principles underpinning IEM are that there be:

- informed decision-making;
- accountability for information on which decisions are taken;
- accountability for decisions taken;
- a broad meaning given to the term environment (i.e. one that includes physical, biological, social, economic, cultural, historical and political components);
- an open, participatory approach in the planning of proposals;
- consultation with interested and affected parties;
- due consideration of alternative options;
- an attempt to mitigate negative impacts and enhance positive aspects of proposals;
- an attempt to ensure that the 'social costs' of development proposals (those borne by society, rather than the developers) be outweighed by the 'social benefits' (benefits to society as a results of the actions of the developers);
- democratic regard for individual rights and obligations;
- compliance with these principles during all stages of the planning, implementation and decommissioning of the proposals (i.e. from 'cradle to grave'), and
- The opportunity for public and specialist input in the decision-making process.

These principles are in line with NEMA, which has repealed a number of the provisions of the Environment Conservation Act, 1989 [ECA] (Act No. 73 of 1989), and is focussed primarily on co-operative governance, public participation and sustainable development. The Environmental Impact Assessment Regulations that took effect in July 2006 regulate the procedures and criteria for the submission, processing, consideration and decision on applications for environmental authorisation of listed activities.

## 1.2 SCOPE

The general principles contained within this document apply to all **PRE-CONSTRUCTION** , **CONSTRUCTION** and **OPERATIONAL** activities.

### Principles of this EMP

This EMP is compiled using the following concepts and implementation requirements so that the higher principles of sustainable development are realised:

- Continuous improvement. The project proponent (or implementing organisation) must commit to review and to continually improve environmental management, with the objective of improving overall environmental performance.
- Broad level of commitment. A broad level of commitment is required from all levels of management as well as the workforce in order for the development and implementation of this EMP to be successful and effective.
- Flexible and responsive. The implementation of the EMP must respond to new and changing circumstances, i.e. rapid short-term responses to problems or incidents. The EMP is a dynamic "living" document and thus regular planned review and revision of the EMP must be carried out.
- Integration across operations. This EMP must integrate across existing line functions and operational units such as health, safety and environmental departments in a company/project. This is done to change the redundant mindset of seeing environmental management as a single domain unit.
- Legislation. It is understood that any development project during its construction phase is a dynamic activity within a dynamic environment. The Developer, Engineer, Contractor and sub-contractor must therefore be aware that certain activities conducted during construction may require further licensing or environmental approval, e.g. river or stream diversions, bulk fuel storage, waste disposal, etc. The Contractor must consult the ER, EO and ECO on a regular basis in this regard. } NB



## 1.3 SITE SPECIFIC INFORMATION

### 1.3.1 Proposed activity and local context

Future activities proposed by the CSIR that will take place on the above mentioned Farm will consist of the following:-

- Installation of several new satellite antennae greater/less than 21 metres in height.
- Construction of masts of any material or type and of any height, including those used for telecommunication, broadcasting and radio transmission.
- Construction of new buildings in Farm Haartebeesthoek 502 JQ within Mogale Local Municipality for offices and tracking laboratories.
- Construction of new internal service roads with width exceeding 4 metres.
- New ducting for electrical and signal cables and water supply to new and existing infrastructure.
- Construction of storm water drainage from new building to the existing ones.

### 1.3.2 Summary of impacts associated with the proposed activity

Potential impacts and key issues identified for the proposed development include:

#### **Biophysical Impacts**

- Ecological impacts resulting from clearance of vegetation within the entire footprint of the new developments;
- Impacts on bird life as a result of site clearance, Antennae and construction of service roads;
- Impacts on soils and landform due to construction;
- Air quality disturbance due to dust generated during construction ;and
- Environmental contamination due to hazardous spillages.

#### **Social Impacts**

- Contravention of occupational health and safety Act through non-compliance with requirements of personal protective Equipments;
- Visual and aesthetic impacts resulting from construction of access roads, Antennae, and a cleared servitude;
- Cultural and Heritage impacts as a result of constructing;

### 1.3.3 CSIR environmental management policy and commitments

It should be noted however that CSIR guidelines and procedures must be followed and adhered to for all activities that take place for all phases of the development (it is the responsibility of the contractor to ensure that the latest version is sought prior to the commencement of any activity on site). These include but are not limited to CSIR SHE policy

### 1.4 ROLE PLAYERS AND RESPONSIBILITY MATRIX

In order for the EMP to be successfully implemented, all the role players involved in the project need to co-operate. For this to happen, role players must have a clear understanding of their roles and responsibilities in the project, must be professional, form respectful and transparent relationships, and maintain open lines of communication. The EMP therefore clearly defines possible role players to be involved and indicates their role in the implementation of the EMP.

Typically, these role players or the project team may include the Authorities (A), Other Authority (OA), Developer/Proponent (D), Consulting Engineers (CE), Resident Engineer (RE), Environmental Officers (EO), Environmental Site Officer (ESO), Environmental Control Officer (ECO), Project Manager (PM), Contractors (C), Environmental Assessment Practitioner (EAP). Further; landowners, interested and affected parties and the relevant environmental and project specialists are also important role players.

**Table 1: Functions and Responsibilities of the Project Team**

KEY	FUNCTION	RESPONSIBILITY
D	Developer	Proponent ultimately accountable for ensuring compliance to the EMP and conditions contained in the Environmental Authorisation (EA). The ECO must be contracted by the developer (full time or part time depending on the size of the project) as an independent appointment to objectively monitor implementation of relevant environmental legislation, conditions of Environmental Authorisations (EA's), and the EMP for the project. The developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities. The developer must ensure that the ECO is integrated as part of the project team.
CE	Consulting Engineer	Contracted by the developer to design and specify the project engineering aspects. Generally the engineer runs the works contract. The CE may also fulfil the role of Project Manager on the proponent's behalf (See PM).
PM	Project Manger	The Project manager has over-all responsibility for managing the project, contractors, and consultants and for ensuring that the environmental management requirements are met. The CE may also act as the PM. All decisions regarding environmental procedures must be approved by the PM. The PM has the authority to stop any construction activity in contravention of the EMP in accordance with an agreed warning procedure.
ER	Engineers Representative	The consulting engineer's representative on site. Has the power/mandate to issue site instructions and in some instances, variation orders to the contractor, following request by the EO or ECO. The ER oversees site works, liaison with Contractor and ECO.

KEY	FUNCTION	RESPONSIBILITY
EO/EM	Environmental Officer /Environmental manager	<p>Appointed by the Consulting Engineers as their environmental representative on site. The EO is not independent but must rather act on behalf of the consulting engineers with the mandate to enforce compliance under the project contract, which must include the EMP. The EO has the directive to issue non-conformance and hazard certificates. Further, in terms of accepted industry practice the EO could issue the equivalent of a "cease works" instruction only in exceptional circumstances where serious environmental harm has been or is about to be caused i.e. in cases of extreme urgency and then only when the ER is absent.</p> <p>The EO must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site. On certain types of projects, such as linear developments (fences, pipelines, etc), the EO must also be the liaison between the contractor and landowners.</p> <p>The EO must attend relevant project meetings, conduct daily inspections to monitor compliance with the EMP, and be responsible for providing reports and feedback on potential environmental problems associated with the development to the project team and ECO.</p> <p>The EO must convey the contents of this EMP to the Contractor site team and discuss the contents in detail with the Contractor as well as undertake to conduct an induction and an environmental awareness training session prior to site handover to all contractors and their workforce.</p> <p>The EO must be suitably experienced with the relevant qualifications and preferably competent in construction related methods and practices.</p>
ECO	Environmental Control Officer	<p>An independent appointment to objectively monitor implementation of relevant environmental legislation, conditions of Environmental Authorisations (EA's), and the EMP for the project. The ECO must be on site prior to any site establishment and must endeavour to form an integral part of the project team.</p> <p>The ECO must be proactive and have access to specialist expertise as and when required, these include botanist's ecologists etc. Further the ECO must also have access to expertise such as game capture, snake catching, etc.</p> <p>The ECO must conduct audits on compliance to relevant environmental legislation, conditions of EA, and the EMP for the project. The size and sensitivity of the development, based on the EIA, will determine the frequency at which the ECO will be required to conduct audits. (A minimum of a monthly site inspection must be undertaken).</p> <p>The ECO must be the liaison between the relevant authorities and the project team. The ECO must communicate and inform the developer and consulting engineers of any changes to environmental conditions as required by relevant authoritative bodies. The ECO must ensure that the registration and updating of all relevant EMP documentation is carried out.</p> <p>The ECO must be suitably experienced with the relevant environmental management qualifications and preferably competent in construction related methods and practices.</p> <p>The ECO must handle information received from whistle blowers as confidential and must address and report these incidences to the relevant Authority as soon as possible.</p> <p>On small projects, where no EO is appointed, the ECO must convey the contents of this EMP to the Contractor site team and discuss the contents in detail with the Contractor as well as undertake to conduct an induction and an environmental awareness training session prior to site handover to all contractors and their workforce.</p>
C	Contractor	<p>The principle contractor, hereafter known as the 'Contractor', is responsible for implementation and compliance with the requirements of the EMP and conditions of the EA's, contract and relevant environmental legislation. The Contractor must ensure that all sub-contractors have a copy of and are fully aware of the content and requirements of this EMP.</p> <p>The contractor is required, where specified, to provide Method Statements setting out in detail how the management actions contained in the EMP will be implemented.</p>

KEY	FUNCTION	RESPONSIBILITY
ESO	Environmental Site Officer	The ESO is employed by the Contractor as his/her environmental representative to monitor, review and verify compliance with the EMP by the contractor. This is not an independent appointment; rather the ESO must be a respected member of the contractor's management team. Dependent on the size of the development the ESO must be on site one week prior to the commencement of construction. The ESO must ensure that he/she is involved at all phases of the construction (from site clearance to rehabilitation).
A	Lead Authority	The authorities are the relevant environmental department that has issued the Environmental Authorisation. The authorities are responsible for ensuring that the monitoring of the EMP and other authorisation documentation is carried out, this will be achieved by reviewing audit reports submitted by the ECO and conducting regular site visits.
OA	Other Authority	Other authorities are those that may be involved in the approval process of an EMP. Their involvement may include reviewing EMP's to ensure the accuracy of the information relevant to their specific mandate. Other authorities may be involved in the development, review or implementation of an EMP. For example if a specific development requires a water use licence for the relevant national authority then that authority should review and comment on the content of the particular section pertaining to that mandate.
EAP	Environmental Assessment Practitioner	The definition of an environmental assessment practitioner in section 1 of NEMA is "the individual responsible for the planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management plans or any other appropriate environmental instruments introduced through regulations".

## 1.5 CONTRACTOR ENVIRONMENTAL METHOD STATEMENTS

Method Statements are written submissions to the Engineer by the Contractor, in collaboration with his/her ESO, in response to a request by the EO and or Engineer. The Method Statements set out the plant, materials, labour and method that the contractor proposes using to carry out an activity, identified by the EO and/or Engineer. The Method Statements contain the appropriate detail such that the EO and Engineer are able to assess whether the Contractor's proposal is in accordance with the requirements of the EMP. The contractor must sign each Method Statement along with the EO and Engineer to formalise the approved Method Statement.

All Method Statements including those which may be required as *ad hoc* or emergency construction method statements must be submitted to the Engineer for approval prior to the commencement of the activity.

Any changes to the method of works must be reflected by amendments to the original approved Method Statement. Any changes in this regard must be approved by the EO and Engineer on the understanding that such changes are environmentally acceptable and in line with the requirements of this EMP.

The *pro forma* Method Statements attached must be used and method statements for the following activities must be submitted to the EO, ECO and Engineer for approval before construction commences:

- Solid waste management
- Workshop and maintenance/cleaning of plant
- Cement and concrete batching
- Dust control
- Hydrocarbon and emergency spills procedures
- Diesel tanks and refuelling procedures
- Sourcing, excavating, transporting and dumping of fill and spoil material
- Topsoil management
- Fire

### **1.5.1 SITE DOCUMENTATION**

The following is list of documentation that must be held on site and must be made available to the ECO and/or GDARD on request.

- Access negotiations and physical access plan
- Site daily diary /instruction book/ Incident reports
- Records of all remediation / rehabilitation activities
- Copies of EO reports (management and monitoring)
- Environmental Management Plan (EMP)
- Complaints register
- Method statements

### **1.5.2 Pro forma documentation**

#### *1.5.2.1 prior to the commencement of construction activities*

The following attached *pro forma* documentation is to be filled out and is binding to the EMP and project contract and includes, but is not limited to the following:

- Declaration of understanding by the Proponent
- Declaration of understanding by the Engineer
- Declaration of understanding by the Contractor
- Method statements
- ECO / Engineer approval for method statements
- Access negotiations and physical access plan

#### *1.5.2.2 During construction activities*

The following attached *pro forma* documentation is to be filled out and maintained. These are binding to the EMP and project contract. They include, but are not limited to, the following:

- Amended Method Statements
- ECO / Engineer approval for amended method statements

- Environmental incidents
- Records of all remediation / rehabilitation activities

## **1.6 National and Provincial Acts and guidelines**

The common list of legislative references contained herein is by no means exhaustive but is applicable to the general principals of this document.

### **Animals Protection Act No. 71 of 1962**

Provides for the protection of animals.

### **Atmospheric Pollution Prevention Act No. 45 of 1965**

Control of noxious and offensive gases, smoke, dust and vehicular emissions.

*DEAT: Regional Air Pollution Control Office*

### **Conservation of Agricultural Resources Act No. 43 of 1983**

Control of the utilisation and protection of wetlands, soil conservation, control and prevention of veldt fires, control of weeds and invader plants.

*Department of Agriculture*

### **Environment Conservation Act No. 73 of 1989**

#### **National Environmental Management Act No. 107 of 1998**

Control/prevention of pollution; combating of noise; activities which may have a detrimental effect on the environment, preparation and contents of environmental impact reports.

*Department of Environmental Affairs and Tourism, Department of Water Affairs and Forestry, Directorate: Environmental Management of the Provincial Department of Environmental and Cultural Affairs and Sport, Local Authorities*

### **Fencing Act No. 31 of 1963**

Clearing of bushes for border fencing, Access to property for fencing.

*Department of Agriculture*

### **Forest Act No. 122 of 1984**

#### **Hazardous Substances Act No. 15 of 1973**

Provides for the control of substances, which may cause injury or ill health to, or the death of human beings.

*National Department of Health. Local Authorities may be authorized*

#### **Health Act No. 63 of 1977**

Control of solid, liquid and gaseous wastes that may pose a health hazard.

*Department of Health and Local Authorities*

### **Minerals and Petroleum Resources Development Act No. 28 of 2002**

#### **National Act on Forests Act No. 84 of 1998**

Control over encroaching, protection of trees on private land, prevention and extinction of fire hazards.

*Cape Nature Conservation, Department of Water Affairs and Forestry*

### **National Building Regulations and Standards Act 103 of 1977 (SABS 0400)**

#### **National Heritage Resources Act No. 25 of 1999**

#### **National Road Traffic Act No. 93 of 1996**

Provides for road traffic matters which apply uniformly throughout South Africa.

*Department of Transport.*

#### **National Veldt and Forest Fires Act No.101 of 1998**

Fire Protection Associations. Building of fire breaks.

*Department of Water Affairs and Forestry*

**National Water Act No. 36 of 1998**

**Water Services Act No. 108 of 1997**

Diversion or impoundment of rivers. Conservation and use of water. Treatment and disposal of waste, wastewater and effluent. Pollution and pollution emergencies. Water Users & Associations. Dam safety. Registration of boreholes.

*Department of Water Affairs and Forestry*

**Nature Conservation Ordinance No. 74 of 1979**

Private Nature Reserves, Conservancies, Certificate of adequate enclosure, translocation and re-establishment of animals. Craft on inland waters. Certification of hunting regulations and protection of flora & fauna.

*Cape Nature Conservation*

**Occupational Health and Safety Act No. 85 of 1993**

Controls the exposure of employees and the public to dangerous and toxic substances or activities.

*Department of Labour*

**Road Transportation Act No. 74 of 1977**

*Department of Transport*

**World Heritage Resource Act No 49 of 1999**

Conservation of national heritage and archaeological material.

South African Heritage Resources Agency.

*National Council for Heritage*

## SECTION 2: CONSTRUCTION PHASE EMP - IMPLEMENTATION

### 2.1 PREAMBLE

The point of departure for this EMP is to ensure a pro-active rather than re-active approach to environmental performance by addressing potential problems before they occur. This will limit corrective measures needed during the construction phase of the project. Therefore the purpose of an EMP is to provide management measures that must be implemented by Developers, Engineers and Contractors alike to ensure that the potential impacts of a proposed development are minimised. It must also be ensured that the EMP is maintained and upheld as a dynamic document in order for the project team to add or improve on issues that might be considered left out or not relevant to the project. In such instances the approving authority may authorise the ECO to make such changes.

The following tables (see page 22) form the core mitigation measures appropriate to the pre-construction and construction phase. The tables present the objectives to be achieved and the management actions that need to be implemented in order to mitigate the negative impacts and enhance the benefits of the project. Associated responsibilities, criteria/targets and timeframes are clearly specified.

The '**pre-construction**' section of this EMP, refers to the period of time leading up to and prior to commencement of construction activities, and is included to ensure pro-active environmental management measures with the goal of identifying avoidable environmental damage at the outset and sustain optimal environmental performance throughout the construction phase. Most impacts will occur during the construction phase and must be mitigated through the contingency plans identified in the pre-construction phase.

The bulk of environmental impacts will have immediate effect during the '**construction**' phase (e.g. noise, dust, and water pollution). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the measures outlined in this section, together with a commitment to sound environmental management from the project team.

The "**construction**" section refers to all construction and its operation-related activities that will occur within the approved area and access roads, until the project is completed. This "construction" section is divided into three functional areas, namely "materials"; "plant"; and "construction". Each of these functional areas within the EMP contains specific mitigation requirements and requested contractor method statements stipulated where required.

### 2.2 STRUCTURE AND CONTENTS OF TABLES

The table consists of seven parts as follows:

**"Phase of development"** - This row will identify either pre-construction (planning) or actual construction phase.

**"Impact / issue"** - This row will identify the issue being addressed, e.g. Materials, site demarcation, heritage, etc.



**Mitigation Measure** - This column will include all the necessary mitigation measures for each impact/issue'.

**Management objectives** - This column will indicate what the management objectives to be achieved for each mitigation measure are.

**Measurable targets** - This column will indicate what evidence is to be used as an indication to whether or not the 'Management objectives' have been implemented and hence achieved.

**Frequency of action** - These columns provide time guidelines for the 'Responsible party' by which he/she is to action or manage the required mitigation.

### **SPECIALIST RECOMMENDATIONS**

The last part of the table provides specialist recommendations that need to be addressed during the pre-construction and construction phases (See page 45).

<b>Phase of development</b>	<b>PRE-CONSTRUCTION</b>
<b>Impact / issue</b>	<b>GENERAL PLANNING (A)</b>

<b>MITIGATION MEASURE</b>	<b>MANAGEMENT OBJECTIVES</b>	<b>MEASURABLE TARGETS</b>	<b>FREQUENCY OF ACTION</b>	<b>NOTES</b>
<p><b>A1 Project contract and programme</b></p> <ul style="list-style-type: none"> <li>The EMP must be included as part of the tender documentation thereby making it part of the enquiry document to make the recommendations and constraints, as set out in this document, enforceable under the general conditions of contract.</li> <li>A copy of this EMP must be available on site. The Contractor must ensure that all the personnel on site, sub-contractors and their team, suppliers, etc. are familiar with and understand the specifications contained in the EMP.</li> </ul>	<ul style="list-style-type: none"> <li>Contingencies for minimising negative impacts anticipated to occur during the construction phase</li> <li>Ensure environmental awareness and formalise environmental responsibilities and implementation</li> </ul>	<ul style="list-style-type: none"> <li>Contract records</li> <li>Signed declaration pro forma's</li> </ul>	-	
<p><b>A2 Appointments and duties of project team</b></p> <ul style="list-style-type: none"> <li>The contract details for the ECO, ER, EO, Contractor and ESO must be completed on the attached pro-forma and a copy kept on site. This document must be made available to the approving authority on request.</li> <li>Before construction activities commence, role players must have a clear indication of their role in the implementation of this EMP as indicated in 1.2.6 Table 1.</li> <li>Subcontractor(s) contracts with the principle contractor must contain a clause to the effect that the disposal of all construction-generated refuse / waste to an officially approved dumping site is the responsibility of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMP.</li> </ul>	<ul style="list-style-type: none"> <li>Contingencies for minimising negative impacts anticipated to occur during the construction phase</li> </ul>	<ul style="list-style-type: none"> <li>Contract records</li> <li>Signed declaration pro forma's</li> </ul>	-	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p><b>A3 Method statements</b></p> <ul style="list-style-type: none"> <li>As required in 1.4, certain method statements must be provided by the contractor. All activities which require method statements may only commence once the method statements have been approved by the engineer and or ECO as applicable.</li> <li>Where applicable, the contractor will provide job-specific training on an ad hoc basis when workers are engaged in activities, which require method statements.</li> </ul>	<ul style="list-style-type: none"> <li>Contingencies for minimising negative impacts anticipated to occur during the construction phase</li> </ul>	<ul style="list-style-type: none"> <li>Approved method statements and relevant pro forma documents</li> <li>Training records</li> </ul>	As and when required	
<p><b>A4 Site demarcation and development</b></p> <ul style="list-style-type: none"> <li>The surveys for the overall project area and construction footprint as approved in the Environmental Authorisation (EA) must be complete and clearly demarcated and fenced before the contractors set up their crew camps or begin construction.</li> <li>"No-go" areas such as Non Perennial river, land not to be developed, etc. must be clearly demarcated (e.g. warning tape) and fenced prior to the commencement of construction activities.</li> <li>All relevant 'general' and 'specific' conditions contained in the Environmental Authorisation (EA) must be included in the space provided below and included as part of this EMP when the "declaration of understanding" is signed by the Developer, Engineer and Contractor. The proponent is to sign the space provided.</li> </ul>	<ul style="list-style-type: none"> <li>Contingencies for minimising negative impacts anticipated to occur during the construction phase</li> </ul>	<ul style="list-style-type: none"> <li>Demarcated area's</li> <li>Filled in section of this document</li> </ul>	As and when required	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p><b>A5 Emergencies, non-compliance and communication</b></p> <ul style="list-style-type: none"> <li>The contractor must provide method statements on the protocols to be followed, and contingencies to be put in place for the following potential incidents before construction may begin: Contamination of natural water resources from spills; contamination of soils from spills; and fire.</li> <li>Communication in emergencies must follow the suggested lines of communication as stipulated 1.2.6 figure 1.</li> <li>The contractor understands that failure to adhere to the requirements of the EMP will result in fines as stipulated in 1.2.8 'Tolerances', over and above the costs incurred for any remediation required as result of the specific non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>Contingencies for minimising negative impacts anticipated to occur during the construction phase</li> </ul>	<ul style="list-style-type: none"> <li>Method statements</li> </ul>	As and when required	

Phase of development	GENERAL PLANNING	EA reference number	
Impact / issue	EA Conditions (B)	Proponents signature	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
The Environmental Authorisation conditions will be included in this section.	•	•		
	•	•		

Phase of development	CONSTRUCTION
Impact / issue	Materials (C)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<b>Handling</b> <b>C1 Stockpiles</b> <ul style="list-style-type: none"> <li>All stockpiled material must be easily accessible without any environmental damage.</li> <li>All temporarily stockpiled material must be stockpiled in such a way that the spread of materials are minimised.</li> <li>The stockpiles may only be placed within the demarcated areas the location of which must be approved by the ER, EO or ECO.</li> <li>The contractor must avoid vegetated areas that will not be cleared.</li> <li>Soils from different horizons must be stock piled such that topsoil stockpiles do not get contaminated by sub-soil material.</li> <li>No plant, workforce or any construction related activities may be allowed onto the topsoil stockpiles.</li> <li>Stock piles must not be higher than 2m to avoid compaction thereby maintaining the soil integrity and chemical composition.</li> </ul>	<ul style="list-style-type: none"> <li>Minimise scaring of the soil surface and land features</li> <li>Minimise disturbance and loss of soil</li> <li>Minimise construction footprint</li> <li>Minimise sedimentation of nearby drainage lines</li> <li>Maintain the integrity of topsoil's for landscaping and rehabilitation</li> <li>Containment of invasive plant growth</li> <li>Minimise contamination of storm water run-off</li> </ul>	<ul style="list-style-type: none"> <li>No visible erosion scars once construction is completed</li> <li>The footprint has not exceeded the agreed site in terms of EA etc.</li> <li>Minimal invasive weed growth</li> <li>No signs of sedimentation and erosion</li> </ul>	Daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p><b>C2 Oil and chemicals</b></p> <ul style="list-style-type: none"> <li>The contractor must provide method statements for the "handling &amp; storage of oils and chemicals", "fire", and "emergency spills procedures".</li> <li>These substances must be confined to specific and secured areas within the contractor's camp, and in a way that does not pose a danger of pollution even during times of high rainfall. These areas must be imperviously banded with adequate containment (at least 1.5 times the volume of the fuel) for potential spills or leaks.</li> <li>Drip trays (minimum of 10cm deep) must be placed under all vehicles that stand for more than 24 hours. Vehicles suspected of leaking must not be left unattended, drip trays must be utilised.</li> <li>The surface area of the drip trays will be dependent on the vehicle and must be large enough to catch any hydrocarbons that may leak from the vehicle while standing.</li> <li>Spill kits must be available on site and in all vehicles that transport hydrocarbons for dispensing to other vehicles on the construction site. Spill kits must be made up of material/product that is in line with environmental best practice (SUNSORB is a recommended product that is environmentally friendly).</li> <li>All spilled hazardous substances must be contained in impermeable containers for removal to a licensed hazardous waste site, (this includes contaminated soils, and drenched spill kit material).</li> </ul>	<ul style="list-style-type: none"> <li>Prevention of pollution of the environment</li> <li>Minimise chances of transgression of the acts controlling pollution</li> </ul>	<ul style="list-style-type: none"> <li>No pollution of the environment</li> <li>No litigation due to transgression of pollution control acts</li> <li>No complaints from I &amp; AP's</li> <li>Method statements</li> </ul>	Daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p><b>C3 Cement</b></p> <ul style="list-style-type: none"> <li>The contractors must provide and maintain a method statement for "cement and concrete batching". The method statement must provide information on proposed storage, washing &amp; disposal of cement, packaging, tools and plant.</li> <li>The mixing of concrete must only be done at specifically selected sites on mortar boards or similar structures to contain run-off into soils rocky outcrops, streams and natural vegetation.</li> <li>Cleaning of cement mixing and handling equipment must be done using proper cleaning trays.</li> <li>All empty containers must be stored in a dedicated area and later removed from the site for appropriate disposal at a licensed facility.</li> <li>Any spillage that may occur must be investigated and immediate remedial action must be taken.</li> <li>The visible remains of concrete, either solid, or from washings, must be physically removed immediately and disposed of as waste to a registered landfill site.</li> <li>Cement batching areas must be located in consultation with the ER, EO or ECO to ensure residues are contained and that the proposed location does not fall within sensitive areas such as drainage lines, storm water channels, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Minimise the possibility of cement residue entering into the surrounding environment</li> <li>Minimise pollution of soil, surface and ground water resources</li> </ul>	<ul style="list-style-type: none"> <li>No evidence of contaminated soil on the construction site</li> <li>No evidence of contaminated water resources</li> <li>Method statement</li> </ul>	<p>Monitored daily</p>	



MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p><b>C4 DANGEROUS AND TOXIC MATERIALS</b> <b>(Provision of storage facilities)</b></p> <ul style="list-style-type: none"> <li>Materials such as fuel, oil, paint, herbicide and insecticides must be sealed and stored in bermed areas or under lock and key, as appropriate, in well-ventilated areas.</li> <li>Sufficient care must be taken when handling these materials to prevent pollution. Training on the handling of dangerous and toxic materials must be conducted for all staff prior to the commencement of construction.</li> <li>In the case of pollution of any surface or groundwater, the Regional Representative of the <b>Department of Water Affairs (DWA)</b> must be informed immediately.</li> <li>Storage areas must display the required safety signs depicting "no smoking", "No Naked lights" and "Danger" containers must be clearly marked to indicate contents as well as safety requirements.</li> <li>The contractor must supply a <b>method statement</b> for the storage of hazardous materials at tender stage.</li> <li>Material Safety Data Sheets (MSDS) must be prepared for all hazardous substances on site and supplied by the supplier where relevant. MSDS's must be updated as required.</li> </ul>	<ul style="list-style-type: none"> <li>Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments</li> <li>Minimise chances of transgression of the acts controlling pollution</li> </ul>	<ul style="list-style-type: none"> <li>No visible signs of pollution</li> <li>No litigation due to transgression of pollution control acts</li> </ul>	<p>Monitor daily</p>	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p><b>C5 storage of fuels and oils</b></p> <ul style="list-style-type: none"> <li>The contractors must provide and maintain a method statement for "fuel tanks and refuelling procedures".</li> <li>Fuel storage tanks on the site must be on an impervious surface that is bunded and able to contain at least 110% of the volume of the tanks. The filler tap must be inside the bunded area where possible and the bund wall must not have a tap or valve.</li> <li>A Flammable Liquid License must be obtained for diesel volumes greater than 200 litres.</li> <li>Environmental Authorisation is required for volumes greater than 30 000 litres.</li> <li>Fuel storage tanks must be placed so that they are out of the way of traffic, so that the risk of the tanks being ruptured or damaged by vehicles is minimised.</li> <li>Bulk fuel storage areas should be covered during the rainy season.</li> </ul>	<ul style="list-style-type: none"> <li>Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments</li> <li>Minimise chances of transgression of the acts controlling pollution</li> </ul>	<ul style="list-style-type: none"> <li>No visible signs of pollution</li> <li>No litigation due to transgression of pollution control acts</li> <li>Method statement</li> </ul>	Once off, as required	
<p><b>C6 Use of dangerous and toxic materials</b></p> <ul style="list-style-type: none"> <li>The contractor must keep the necessary materials and equipment on site to deal with spills/ fire of the materials present should they occur.</li> <li>The contractor must set up a procedure for dealing with spills/ fire, which will include notifying the ECO and the relevant authorities prior to commencing with construction. These procedures must be developed with consultation and approval by the appointed EO.</li> <li>A record must be kept of all spills and the corrective action taken.</li> </ul>	<ul style="list-style-type: none"> <li>Prevention of pollution of soil, surface and ground water resources in the immediate and surrounding environments</li> <li>Minimise chances of transgression of the acts controlling pollution</li> </ul>	<ul style="list-style-type: none"> <li>No pollution of the environment</li> <li>No litigation due to transgression of pollution control acts</li> </ul>	As required	

Phase of development	CONSTRUCTION
Impact / issue	PLANT (D)

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p><b>D1 Eating areas</b></p> <ul style="list-style-type: none"> <li>The Contractor must, in conjunction with the EO, designate restricted eating areas for eating during normal working hours. Adequate closed refuse bins must be provided and cleaned on a daily basis.</li> <li>No fires are to be lit outside of a facility designed to contain fires. The adequacy and positioning of these structures must be determined in consultation with the EO and ECO.</li> <li>The feeding, or leaving of food, for stray or other animals in the area is strictly prohibited.</li> <li>Litter (even if originating outside the camp) and concrete bags etc. must be picked up daily and put into suitably closed bins.</li> </ul>	<ul style="list-style-type: none"> <li>Control potential influx of vermin and flies</li> <li>Neat work place and hygienic environment</li> <li>Minimise negative social impacts to local residents and businesses</li> </ul>	<ul style="list-style-type: none"> <li>No visual sign of vermin and flies</li> <li>No complaints from I &amp; AP's</li> </ul>	Once off, monitor daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p><b>D2 Toilets and ablution facilities</b></p> <ul style="list-style-type: none"> <li>Sanitary arrangements must be to the satisfaction of the ECO and the local authority. Toilets must be of the chemical type. The toilets must be kept clean, neat and hygienic condition. The contractor must supply toilet paper at all toilets at all times. Toilet paper dispensers must be provided in all toilets.</li> <li>Toilets provided by the contractor must be easily accessible and a maximum of 50m from the works area to ensure they are utilised.</li> <li>Toilets out on site must be secured to the ground and have a sufficient locking mechanism operational at all times.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure proper sanitation is achieved which will encourage the workforce to utilise toilets provided and not the surrounding habitat</li> <li>Minimise potential of diseases on site</li> <li>Minimise potential to pollute soils, water resources and natural habitats</li> </ul>	<ul style="list-style-type: none"> <li>Workforce use toilets provided</li> <li>No complaints received from I &amp; AP's as well as members of the workforce</li> <li>No visible or measurable signs pollution of the environment (soils, ground and surface water)</li> </ul>	As and when required	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p><b>D3 Waste management</b></p> <ul style="list-style-type: none"> <li>The contractors must provide and maintain a method statement for "solid waste management". The method statement must provide information on proposed licensed facility to be utilised and details of proposed record keeping for auditing purposes.</li> <li>Waste must be separated into recyclable and non-recyclable waste, and must be separated as follows: <ul style="list-style-type: none"> <li>Hazardous waste: including (but not limited to) old oil, paint, etc,</li> <li>General waste: including (but not limited to) construction rubble,</li> </ul> </li> <li>Any illegal dumping of waste must not be tolerated, this action will result in a fine and if required further legal action will be taken. This aspect must be closely monitored and reported on; proof of legal dumping must be able to be produced on request.</li> <li>Bins must be clearly marked for ease of management.</li> <li>Sufficient closed containers must be strategically located around the construction site to handle the amount of litter, wastes, rubbish, debris, and builder's wastes generated on the site.</li> <li>Subcontractor(s) must contain a clause to the effect that the disposal of all construction-generated refuse / waste to an officially approved dumping site is the responsibility of the subcontractor in question and that the subcontractors are bound to the management activities stipulated in this EMP. Proof of this undertaking must be issued to the ECO.</li> <li>All solid and chemical wastes that are generated must be removed and disposed of at a licensed waste disposal site. The contractor is to provide proof of such to the EO and ECO.</li> <li>Chemical containers and packaging brought onto the site must be removed for disposal at a suitable site.</li> <li>A skip, with a cover, must be used to contain refuse from campsife bins, rubble and other construction material.</li> </ul>	<ul style="list-style-type: none"> <li>Sustainable management of waste by recycling</li> <li>To keep the site neat and tidy</li> <li>Minimise litigation and complaints by I&amp;AP's</li> <li>Reduce visual impact</li> <li>Control potential influx of vermin and flies thereby minimising the potential of diseases on site and the surrounding environment</li> <li>Minimise potential to pollute soils, water resources and natural habitats</li> </ul>	<ul style="list-style-type: none"> <li>Disposal of rubble and refuse in an appropriate manner with no rubble and refuse lying on site</li> <li>Site is neat and tidy</li> <li>No complaints from surrounding residents and businesses</li> <li>Sufficient containers available on site</li> <li>No visible or measurable signs of pollution of the environment (soils, ground and surface water)</li> <li>Method statement</li> </ul>	Daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p><b>D4 Dust</b></p> <ul style="list-style-type: none"> <li>The contractors must provide and maintain a method statement for "dust control". The method statement must provide information on the proposed source of water to be utilised and the details of the licenses acquired for such usage.</li> <li><b>Potable water must not be used as a means of dust suppression</b>, and alternative measures must be sourced. The use of 'grey' water must be investigated as an alternative. The contractor will be responsible to source this water and obtain the required approvals to utilise this water for the purpose of dust suppression.</li> <li>The construction camp must be watered during dry and windy conditions to control dust fallout.</li> <li>Dust production must be controlled by regular watering of roads and works area, should the need arise. <b>NB:</b> Concrete dust is toxic and damages soil properties. Therefore watering to prevent dust spread must not be done where concrete dust has fallen or it will infiltrate into the soil. Concrete bags must not be allowed to blow around the site and spread cement dust.</li> <li>In addition to the standard dust suppression measures and where these measures are not sufficient, main access roads and site camps must be surfaced with a temporary surface such as gravel to assist with dust suppression.</li> <li>At the end of construction, the site camp must be fully rehabilitated by removing the temporary surface, ripping the area to loosen the soil and the area must be re-vegetated with locally indigenous vegetation only, according to the landscape development plan for the project.</li> <li>All vehicles transporting material that can be blown off (e.g. soil, rubble etc.) must be covered with a tarpaulin, and speed limits of 20 km/h must be adhered to.</li> <li>Regular monitoring of dust fallout must be carried out and the records kept on site. Baseline dust measures must be sampled and approved by the ER and ECO prior to the commencement of construction activities.</li> </ul>	<ul style="list-style-type: none"> <li>Reduce dust fall out</li> <li>Reduce visual impact</li> <li>Minimise loss of valuable soil material</li> </ul>	<ul style="list-style-type: none"> <li>No visible signs of dust</li> <li>No complaints from interested and Affected parties</li> <li>No incidences reported to ECO</li> <li>No visible evidence of dust contamination on the surrounding environment</li> <li>Method statement</li> <li>Baseline targets not exceeded during regular monitoring of dust counts</li> </ul>	<p>Monitored daily</p>	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<ul style="list-style-type: none"> <li>All forms of dust pollution must be managed in terms of the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965)</li> </ul>				

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p><b>D5 Workshop equipment, maintenance and storage</b></p> <ul style="list-style-type: none"> <li>Leaking equipment must be repaired immediately or be removed from site to facilitate repair. All potentially hazardous and non-degradable waste must be collected and removed to a registered waste site.</li> <li>Cleaning and remediation must be done with products that are in line with best environmental practice.</li> <li>The Contractor must be in possession of an emergency spill kit that is complete and available at all times on site. The Contractor must ensure that senior and other relevant members of the workforce are trained in dealing with spills by using emergency spill kits.</li> </ul> <p>The following must be applied:</p> <ul style="list-style-type: none"> <li>All contaminated soil / yard stone shall be removed and disposed of as hazardous waste at a registered facility or placed in containers to be taken to one central point where bio-remediation can be done. (Bio-remediation should only be an option if an Environmental Authorisation has been issued)</li> <li>A specialist Contractor shall be used for the bio-remediation of contaminated soil where the required remediation material and expertise is not available on site.</li> <li>All spills of hazardous substances must be reported to the ESO, EO, ER or ECO.</li> <li>The contractor must comply with the regulations of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).</li> </ul>	<ul style="list-style-type: none"> <li>Prevent pollution of the environment</li> <li>Minimise chance of transgression of the acts controlling pollution</li> <li>Disposal of hazardous substances in an appropriate manner</li> </ul>	<ul style="list-style-type: none"> <li>No pollution of the environment</li> <li>No litigation due to transgression of pollution control acts</li> <li>Method statement</li> </ul>	<p>Monitor daily</p>	



MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p><b>D6 Noise</b></p> <ul style="list-style-type: none"> <li>All construction vehicles must be in a good working order to reduce possible noise pollution.</li> <li>Work hours during the construction phase must be strictly enforced unless permission is given. Permission must not be granted without consultation with the local residents and businesses by the EO.</li> <li>Noise reduction is essential and Contractors must endeavour to limit unnecessary noise, especially loud talking, shouting or whistling, radios, sirens or hooters, motor revving, etc. The use of silent compressors is a specific requirement.</li> <li>Noisy activities must take place only during working hours. The EO must inform surrounding land owners in writing 24 hours prior to any planned activities that will be unusually noisy or any other activities that could reasonably have an impact on the adjacent sites. These activities could include, but are not limited to, blasting, piling, use of pneumatic jack-hammers and compressors.</li> </ul>	<ul style="list-style-type: none"> <li>Maintain noise levels below "disturbing", as defined in the National Noise Regulations</li> <li>Minimise the nuisance factor of the development</li> </ul>	<ul style="list-style-type: none"> <li>No complaints from surrounding landowners or I&amp;AP's</li> </ul>	As and when required	

<b>Phase of development</b>	<b>CONSTRUCTION</b>
<b>Impact / issue</b>	<b>Construction (E)</b>

<b>MITIGATION MEASURE</b>	<b>MANAGEMENT OBJECTIVES</b>	<b>MEASURABLE TARGETS</b>	<b>FREQUENCY OF ACTION</b>	<b>NOTES</b>
<p><b>E1 Crew camps</b></p> <ul style="list-style-type: none"> <li>The contractor is responsible for cleaning the contractor's camp and construction site of all structures, equipment, residual litter and building materials at the end of the construction period and, the topsoil restored in areas where landscaping is to take place.</li> </ul>	<ul style="list-style-type: none"> <li>Minimise water pollution</li> <li>Minimise dust fallout</li> <li>Minimise unwarranted environmental damage outside the footprint</li> <li>Maintain a clean and healthy working environment</li> <li>Minimise impact to surrounding environment</li> </ul>	<ul style="list-style-type: none"> <li>No signs of water or soil pollution</li> <li>No complaints from surrounding landowners or I&amp;AP's</li> <li>No visible signs of litter</li> <li>Method statements</li> </ul>	Monitor daily	
<p><b>E2 Fires</b></p> <ul style="list-style-type: none"> <li>The contractors must provide and maintain a method statement for "fires", clearly indicating where and for what fires will be utilised plus details on the fuel to be utilised</li> <li>Absolutely no burning of waste is permitted.</li> <li>The contractor must provide sufficient wood (fuel) for this purpose.</li> <li>A designated smoking area must be demarcated, away from hazardous substance storage areas.</li> <li>No wood is to be collected, chopped or felled for fires from private or public property as well as from no-go or sensitive</li> </ul>	<ul style="list-style-type: none"> <li>Minimise risk of veldt fires</li> <li>Minimise destruction of natural fauna and flora</li> <li>Maintain safety on site</li> </ul>	<ul style="list-style-type: none"> <li>No veldt fires started by the contractor's workforce</li> <li>No claims from landowners for damages due to veldt fires</li> <li>Method statement</li> </ul>	Monitor daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p>areas within the site and any surrounding natural vegetation.</p>				
<p><b>E3 Erosion and sedimentation</b></p> <ul style="list-style-type: none"> <li>• To reduce the loss of material by erosion, the contractor must ensure that disturbance on site is kept to a minimum. The contractor is responsible for rehabilitating all eroded areas in such a way that the erosion potential is minimised after construction has been completed.</li> <li>• All disturbed areas will require rehabilitation must be mulched to encourage vegetation re-growth. Mulch used must be free from alien seed.</li> <li>• These areas must be cordoned off so that vehicles or construction personnel cannot gain access to these areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Minimise erosion damage</li> <li>• Minimise impeding the natural flow of water</li> <li>• Minimise scarring of the soil surface and land features</li> <li>• Minimise disturbance and loss of topsoil</li> <li>• Re-growth of disturbed areas.</li> </ul>	<ul style="list-style-type: none"> <li>• No erosion scars</li> <li>• No loss of topsoil</li> <li>• No interference with the natural flow of water</li> <li>• No visible erosion scars once construction is completed</li> <li>• The footprint has not exceeded the agreed boundaries</li> <li>• All damaged areas successfully rehabilitated</li> </ul>	<p>As and when required</p>	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p><b>E4 Fauna</b></p> <ul style="list-style-type: none"> <li>All activities on site must comply with the regulations of the Animal Protection Act, 1962 (Act No. 71 of 1962)</li> <li>All construction workers must be informed that the intentional killing of any animal is not permitted as faunal species are a benefit to society. Poaching is illegal and it must be a condition of employment that any employee caught poaching will be dismissed. Employees must be trained on how to deal with fauna species as intentional killing will not be tolerated. In the case of a problem animal e.g. a large snake a specialist must be called in to safely relocate the animal if the EO or ECO is not able to.</li> <li>New transmission lines must be placed as close as possible to the existing transmission lines to increase the visibility of the lines to the birds.</li> <li>A bird specialist must do a walk down assessment of the preferred route before any construction activities may take place.</li> <li>Annual monitoring of the transmission lines must be conducted for determine where collisions with the pylons or cables is taking place. Additional marking may then be necessary for areas where high collision rates are detected</li> <li>The contractor must screen the route for any breeding activity of birds during construction and should avoid disturbance to the area around the breeding site during the breeding season. The contractor should contact the bird specialist if any breeding birds are found for advice on an appropriate buffer around the breeding site where construction must be avoided.</li> <li><b>Safety:</b> <i>Environmental</i> induction training and awareness must include aspects dealing in safety with wild animals into on site. Focus on animals such as snakes and other reptiles that often generate fear by telling labour force how to move safely away and to whom to report the sighting. Labour force should</li> </ul>	<ul style="list-style-type: none"> <li>Minimise disturbance to animals</li> <li>Minimise interruption of breeding patterns of birds</li> <li>Minimise destruction of habitat</li> </ul>	<ul style="list-style-type: none"> <li>No complaints from Nature Conservation</li> <li>No litigation concerning applicable animal protection acts</li> <li>No measurable or visible signs of habitat destruction</li> </ul>	<p>Monitor daily</p>	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p>also be informed where snakes most often hide so that they can be vigilant when lifting stones etc.</p>				

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p><b>E5 Flora</b></p> <ul style="list-style-type: none"> <li>Trees and natural vegetation or any other natural features inside and outside the work area, which will not be cleared for construction purposes, must be clearly demarcated and not be defaced, removed, painted for benchmarks or otherwise damaged, even for survey purposes. The latter can only be done if stipulated in the Environmental Authorisation and must be overseen by the EO and ECO. Any feature defaced by the contractor must be reinstated to the satisfaction of the ECO and penalties/fines may be imposed by the ER.</li> <li>New transmission lines must be placed as close as possible to the existing transmission lines.</li> <li>Search and rescue for Red Data Species and/or for species that can be used for landscaping purposes must be conducted in areas approved and demarcated for construction purposes by qualified, experienced botanists or Zoologists. The specialists involved should ideally be those who were / are involved in the EIA process. The rescued Fauna and Flora must be relocated to suitable conservation areas, protected areas and/or the no-go areas within the site. (Specialists must give input here).</li> <li>Any corridors to surrounding natural areas must be maintained and protected; these must be demarcated as no-go areas.</li> <li>A search and rescue operation must take place at the discretion of the ECO prior to site clearance activities. A nursery must be established should the need arise.</li> <li>The contractor must rehabilitate the construction camp and any other disturbed areas once construction activities have terminated. Compacted areas will be ripped and mulched in order to ensure recovery of the natural vegetation cover.</li> <li>A method statement must be provided and maintained by the contractor.</li> <li>The conditions in the Environmental Management Plan must be adhered to.</li> <li>Once construction is complete, rehabilitation of un-built areas must be undertaken in order to restore the aesthetic &amp; ecological value of the area. It is recommended that a qualified landscape architect, qualified botanist and the ECO be consulted with regard to the most appropriate rehabilitation 36-vegetation and structures. Active re-vegetation must take place with locally indigenous vegetation under the supervision of the ECO.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal disturbance to vegetation where such vegetation does not interfere with construction in terms of approvals from the relevant authority</li> <li>Prevent litigation concerning removal of vegetation</li> <li>Encourage natural habitat fauna</li> <li>Minimise scarring of the soil surface and land features</li> <li>Minimise disturbance and loss of topsoil</li> <li>Minimise risk of veldt fires</li> <li>Minimise risk of fauna and flora destruction</li> </ul>	<ul style="list-style-type: none"> <li>No litigation due to removal of vegetation without necessary permission</li> <li>No exotic plants used for landscaping</li> <li>No visible erosion scars once construction is completed</li> <li>The footprint has not exceeded the agreed boundaries</li> <li>All damaged areas successfully rehabilitated</li> <li>No veldt fires started by contractors work force</li> <li>No claims from landowners for damages due to veldt fires</li> <li>Method statement</li> </ul>	<p>As and when required</p>	
CSIR SATELLITE APPLICATIONS CENTRE				

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p><b>E6 Heritage</b></p> <ul style="list-style-type: none"> <li>In terms of the National Heritage Act, 1999 (Act No. 25 of 1999), construction personnel must be alert and must inform the local Council should they come across any findings of heritage resources within 24 hours.</li> <li>Should any archaeological artefacts be exposed during construction activities, work on the area where the artefacts were found must cease immediately and the ECO must be notified within 24 hours.</li> <li>Upon receipt of such notification, the ECO will arrange for the excavation to be examined by an Archaeologist.</li> <li>Under no circumstances must archaeological artefacts be removed, destroyed or interfered.</li> <li>Any archaeological sites exposed during demolition or construction activities must not be disturbed prior to authorisation by the South African Heritage Resources Agency on the appropriate provincial heritage resource agency.</li> </ul>	<ul style="list-style-type: none"> <li>Limit the destruction of the country's heritage resources</li> <li>The preservation and appropriate management of new archaeological finds should these be discovered during construction.</li> </ul>	<ul style="list-style-type: none"> <li>No destruction of or damage to known archaeological sites</li> </ul>	Monitor Daily	
<p><b>E7 No-go / sensitive areas</b></p> <ul style="list-style-type: none"> <li>All construction activities must remain within the boundaries of the development area, as demarcated at the start of construction.</li> <li>The construction footprint must be kept to a minimum must be clearly demarcated (e.g. warning tape) and fenced prior to the commencement of construction activities thus reducing the infringement of the development on surrounding habitats.</li> <li>No-go areas must be demarcated with fencing/warning tape and signs before any construction activities commence.</li> <li>Vehicles are only to access the site via the approved access road. No vehicular movement is permitted outside of the 132kV servitude.</li> <li>Land close to the fenced "no-go" sensitive areas that are to</li> </ul>	<ul style="list-style-type: none"> <li>Minimise the potential for the spread of the of the construction footprint</li> <li>Reduce loss of fauna and flora habitat</li> <li>Minimise the potential for loss of protected and or endangered fauna and flora species</li> </ul>	<ul style="list-style-type: none"> <li>No sign of movement through "no go" areas.</li> <li>Containment of footprint</li> </ul>	Monitor daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p>be cleared must first be demarcated and screened for Red Data Species by the ECO and a relevant qualified specialist before construction commences.</p>				
<p><b>E8 Access route/haul roads</b></p> <ul style="list-style-type: none"> <li>• No unauthorised access is permitted. Any authorised clearing for access roads must be done under the supervision of the ECO.</li> <li>• Any damaged or degradation will be investigated and fines issued, the affected areas must be immediately rehabilitated.</li> <li>• Any work or access near or in a permanent drainage system may have implications in terms of the National Water Act, 1998 (Act No. 36 of 1998), and therefore may well require application for a water use licence.</li> <li>• Planning of any new access routes must be done in conjunction between the contractor, and CSIR.</li> <li>• Access roads must be planned timeously and must be mapped.</li> <li>• The contractor must make sure that the construction of access roads do not trigger activities listed in NEMA Government Notice Regulations 386 &amp; 387 of April 2006.</li> </ul>	<ul style="list-style-type: none"> <li>• Minimise loss of topsoil and enhancement of erosion</li> <li>• Minimise fauna and flora displacement by destruction of natural habitats</li> </ul>	<ul style="list-style-type: none"> <li>• No erosion on access roads after completion of construction</li> <li>• No loss of topsoil due to runoff water on access roads</li> </ul>	<p>As required, monitor daily</p>	



MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<ul style="list-style-type: none"> <li>Existing roads and services must be utilised as far as possible.</li> <li>Neither the site nor its access roads must be allowed to be utilised for recreational activities, this includes but is not limited to quad bikes, 4x4's and dirt bikes. Security personnel must be informed and ensure that this is enforced.</li> </ul>				
<p><b>E9 Crime, safety and security</b></p> <ul style="list-style-type: none"> <li>No site staff, other than security personnel and skeleton staff will be housed on site unless otherwise stipulated in the Environmental authorisation.</li> <li>A boundary fence must be erected; this will serve to prevent public access to the site, for public safety and security reasons. The access to the site must be controlled so as to restrict unauthorised personnel from entering the site.</li> <li>The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and the National Building Regulations.</li> <li>The contractor must ensure that all emergency procedures are in place prior to commencing work. Emergency procedures must include (but not be limited to) fire, spills, contamination of the ground, accidents to employees, use of hazardous substances and materials, etc.</li> <li>The contractor must ensure that lists of all emergency telephone numbers / contact persons are kept up to date</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the risk of potential incidences</li> <li>Minimise the potential impact on the environment</li> </ul>	<ul style="list-style-type: none"> <li>No incidences reported</li> </ul>	Monitor daily	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p>and that all numbers and names are posted at relevant locations throughout the construction site.</p> <ul style="list-style-type: none"> <li>• The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, as well as the police and ambulance services must be available at prominent locations around the construction site and the construction crew camps.</li> <li>• Construction procedures must make provision for earthing requirements</li> </ul>				
<p><b>E10 Visual impact</b></p> <ul style="list-style-type: none"> <li>• Shade cloth must be utilised to conceal and minimise the visual impact of contractor camps, lay down and storage areas.</li> <li>• The buildings that are to be erected must be aesthetically pleasing and blend into the area as far as possible.</li> </ul>	<ul style="list-style-type: none"> <li>• Minimise visual impact</li> </ul>	<ul style="list-style-type: none"> <li>• No complaints from I &amp; AP's</li> </ul>	<p>Monitor daily</p>	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p><b>E11 Geotechnical</b></p> <ul style="list-style-type: none"> <li>• All trenches and excavation works must be properly backfilled and compacted according to specifications given in sub-clause 5.2.4. Of SABS 1200DA.</li> <li>• Mechanical methods of rock breaking will have noise and dust impacts that must be managed. Method Statements for chemical breaking must be provided by the ER.</li> </ul>	<ul style="list-style-type: none"> <li>• Minimise potential structural faults</li> <li>• Minimise trench collapse</li> </ul>	<ul style="list-style-type: none"> <li>• No visible signs of backfill deterioration or trench collapse</li> </ul>	<p>As and when required</p>	

<p><b>E12 Hydrology</b></p> <ul style="list-style-type: none"> <li>• The ER and or the ECO must assess whether regular water sampling of surface and or ground water resources within the immediate and surrounding environment are necessary. Should this be the case, baseline data from sampling must be obtained relevant to the activity and sensitivity of the area. Regular sampling must then be carried out to determine deviations from the baseline data.</li> <li>• Increased run-off during construction must be managed using berms and other suitable structures as required to ensure flow velocities are reduced. Storm water, wherever possible, should be allowed to soak into the land in the area on which the water fell.</li> <li>• In the event of pollution caused as a result of construction activities, the contractor, according to section 20 of the National Water Act, 1998 (Act No. 36 of 1998) is be responsible for all costs incurred by organisations called to assist in pollution control and/or to clean up polluted areas.</li> <li>• Approval must be obtained from DWA for any activities that require authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998).</li> <li>• No vehicular access is allowed in permanently wet areas.</li> <li>• It must be ensured that all equipment to be used is not the cause irreparable damage to wet areas. The contractor must, where required, use alternative methods of construction in such areas.</li> <li>• No roads are to be cut through river and stream banks as this may lead to erosion causing siltation of streams and downstream dams. Existing drifts and bridges must be used if the landowner gives his consent. Such structures must then be thoroughly examined for strength and durability before they are used.</li> </ul>	<ul style="list-style-type: none"> <li>• Minimise pollution of soil, surface and ground water resources in the immediate and surrounding environments</li> <li>• Minimise impeding the natural flow of water</li> <li>• Minimise the impact on natural water flow dynamics</li> <li>• Minimise scarring of the soil surface and land features</li> <li>• Minimise damage to river and stream embankments</li> </ul>	<ul style="list-style-type: none"> <li>• No visible signs of pollution</li> <li>• No signs of siltation of water courses</li> <li>• No visible erosion scarring once construction is completed</li> <li>• Minimum loss of topsoil</li> <li>• No access roads through river and stream banks</li> <li>• No visible erosion scars on embankments once construction is completed</li> <li>• No erosion or siltation downstream</li> <li>• No deviation from baseline data during regular sampling</li> </ul>	<p>As and when required, monitor daily</p>
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<p><b>E13 Soil</b></p> <ul style="list-style-type: none"> <li>The contractors must provide and maintain a method statement for "management of topsoil".</li> <li>Topsoil must be stripped from all areas that are to be utilized during the construction period and where permanent structures and access is required. These areas will include the permanent works, stockpiles, access roads, construction camps and lay down areas. Topsoil must be stripped after search and rescue (Fauna and Flora) has been conducted and clearing of woody vegetation and before excavation or construction commences.</li> <li>New transmission lines must be placed as close as possible to the existing transmission lines.</li> <li>The removal of plant material must be kept to a minimum. A permit must be obtained to remove Camel Thorn trees.</li> <li>Topsoil must be deemed to be the top layer of soil containing organic material, nutrients and plant seeds. For this reason it is an extremely valuable resource for the rehabilitation and vegetation of disturbed areas.</li> <li>Ripping must be done to a depth of 250 mm in two directions at right angles. Topsoil must be placed in the same soil zone from which it has been stripped.</li> <li>At the beginning of the construction phase, topsoil removed for vegetation clearance must be stripped to a minimum depth of 150 mm and stockpiled on the demarcated topsoil stockpile areas.</li> <li>All topsoil must be removed and stockpiled on the site.</li> <li>However, the use of topsoil for rehabilitation contaminated by the seed of alien vegetation (e.g. blackjacks, etc.) must not be permitted unless a programme to germinate the seed and eradicate the seedlings is drawn up and approved, or some other mitigatory feature is found. This must be approved by the ECO.</li> <li>Single handling is recommended. Stock piles must not be higher than 2m to avoid compaction.</li> </ul>	<ul style="list-style-type: none"> <li>Minimise scaring of the soil surface and land features</li> <li>Minimise disturbance and loss of soil</li> <li>Minimise construction footprint</li> <li>Minimise sedimentation of nearby drainage lines</li> <li>Maintain the integrity of topsoil's for future landscaping and rehabilitation</li> <li>Containment of invasive plant growth</li> </ul>	<ul style="list-style-type: none"> <li>No visible erosion scars once construction is completed</li> <li>The footprint has not exceeded the agreed site in terms of EA etc.</li> <li>Minimal invasive weed growth</li> <li>No signs of sedimentation and erosion</li> <li>Method statement</li> </ul>	<p>Daily</p>
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<ul style="list-style-type: none"> <li>• Dust suppression is necessary for stockpiles older than a month – with either water or a biodegradable chemical binding agent.</li> <li>• Backfilling must be undertaken in such a way that the final contours blend with the surrounding environment.</li> <li>• Remediated slopes must be graded to preferably 1:2</li> <li>• Slopes can then be capped with topsoil. This requires a minimum layer of 100 mm in most areas</li> <li>• Construction during the rainy season (November to March) should be closely monitored and controlled.</li> <li>• Disturbed surfaces to be rehabilitated must be ripped and the area must be backfilled with excavated material from the site.</li> <li>• The conditions in the Environmental Management Plan must be adhered to.</li> </ul>				
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Phase of development	CONSTRUCTION	EAP
Impact / issue	Specialist requirements (F)	Proponents signature

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p><b>F1 LANDSCAPE AND VISUAL IMPACT</b></p> <p><b>ANTENNAE</b></p> <ul style="list-style-type: none"> <li>Rehabilitate disturbed areas around Antennae as soon as practically possible after construction.</li> </ul> <p><b>ACCESS ROADS</b></p> <ul style="list-style-type: none"> <li>Construction vehicles movement must be restricted on existing access roads where possible;</li> <li>Where new access roads are required, the disturbance area should be kept as small as possible;</li> <li>Locate access routes ;</li> <li>Construction activities must avoid crossing over or through ridges, rivers, pans or any natural features that have prominent visual value. This also include centres of floral endemism and areas where vegetation is not resilient and takes extended periods to cover;</li> <li>Maintain no or minimum cleared road verges and;</li> <li>Access routes should be located on the perimeter of disturbed areas such as existing roads</li> </ul> <p><b>CLEARED SERVITUDES</b></p> <ul style="list-style-type: none"> <li>Locate the alignment and the associated cleared servitudes for electric cables so as to avoid the removal of established vegetation; and</li> <li>Avoid a continuous linear path of cleared vegetation that would</li> </ul>	<p>Minimise visual impact</p> <p>Minimise loss of topsoil and enhancement of erosion</p> <p>Minimise fauna and flora displacement by destruction of natural habitats</p> <p>To restrict extended periods of exposed soil.</p> <p>To limit modification to the topography and to avoid the removal of established vegetation.</p>	<p>No erosion on access roads after completion of construction</p> <p>No loss of topsoil due to runoff water on access roads</p> <p>No complaints from I &amp; AP's</p>	<p>As required, monitor daily</p>	

MITIGATION MEASURE	MANAGEMENT OBJECTIVES	MEASURABLE TARGETS	FREQUENCY OF ACTION	NOTES
<p>strongly contrast with the surrounding landscape character. Feather the edges of the cleared corridor to avoid a clearly defined line through the landscape.</p>				
<p><b>F2 AVIFAUNAL IMPACT</b></p> <ul style="list-style-type: none"> <li>• All identified high collision risk of Antennae must be have bird flappers.</li> <li>• Where appropriate bird flappers must be installed on existing and new antennae.</li> <li>• All vehicles and machinery should keep to the site and not create any new roads unless absolutely necessary.</li> <li>• During construction, the Environmental Control Officer should identify any breeding birds close to the site and report this to EWT for case specific recommendations.</li> </ul>	<p>Minimise collision of birds with overhead cables.  Minimise electrocution of birds on poles.  Minimise habitat destruction during construction and maintenance.  Minimise disturbance of birds during construction and maintenance.</p>	<p>No birds are killed as a result of collision with cables.  Minimum destruction of birds' habitat.</p>	<p>As required, monitor daily</p>	
<p><b>F4 HERITAGE ASSESMENT</b></p> <ul style="list-style-type: none"> <li>• Avoid areas with graves</li> <li>• If the contractors and workers come across any heritage artefacts they must report the immediately.</li> </ul>	<p>Limit the destruction of the country's heritage resources</p>	<p>No destruction of or damage to known archaeological sites</p>	<p>monitor daily</p>	



Phase of development	OPERATIONAL	EAP
Impact / issue	General (G)	Proponents signature

<p><b>G1 Storm water Management</b></p> <ul style="list-style-type: none"> <li>Storm water, wherever possible, must be allowed to soak into the land in the area on which the water has been discharged.</li> <li>The storm water system, especially the discharge points, must be inspected and damaged areas must be repaired if required.</li> <li>For all maintenance undertaken reference must be made to recommendations in the engineer's reports and or the approved storm water management plan.</li> <li>All maintenance activities must be monitored to ensure that no environmental damage occurs. All damage must be mitigated immediately.</li> </ul>	<p>Minimise pollution of soil, surface and ground water resources</p> <p>Minimise the potential loss of topsoil</p> <p>Minimise the potential of flooding of the development, or its neighbouring properties</p>	<p>No evidence of pollution at the discharge points</p> <p>No evidence of silt build-up at the discharge points</p> <p>No complaints from I &amp; AP's</p>	<p>As and when required</p> <p>Monitor seasonally</p>
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<p><b>G2 ATMOSPHERIC POLLUTION</b></p> <p><b>Air pollution</b></p> <ul style="list-style-type: none"> <li>All forms of dust/air pollution must be managed in terms of the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965), this includes the control of noxious and offensive gases, smoke, dust and vehicular emissions</li> </ul> <p><b>Light pollution</b></p> <ul style="list-style-type: none"> <li>Night time light sources must be directed away from, conservation areas, naturally vegetated areas, as this may be the cause of ecological disturbance.</li> </ul> <p><b>Noise pollution</b></p> <ul style="list-style-type: none"> <li>Noise levels shall be kept within acceptable limits, these are determined in terms of the relevant local by laws.</li> </ul>	<p>Reduce visual impact</p> <p>Minimise chances of transgression of the acts controlling pollution</p>	<p>No complaints from surrounding residents and businesses</p>	<p>Monitor daily</p>	
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<p><b>G3 Safety and Security</b></p> <ul style="list-style-type: none"> <li>Maintenance work must not be the cause of environmental damage. Any environmental damage caused must be investigated and mitigated immediately.</li> <li>Where Electric fences are installed, these must be monitored to ensure that animals have not been trapped. If animal fatalities have occurred these must be investigated and the services of a qualified specialist (bird, reptile...) must be employed to implement the correct management action to prevent further fatalities.</li> <li>An emergency plan (including fire management) must be developed and implemented; the relevant authority must approve this plan. Ensure that all fire extinguishers are replaced on or before their expiry dates. Ensure that pump devices are in good working order.</li> </ul>	<p>Reduce the risk of potential incidences Minimise litigation and complaints by I&amp;AP's</p>	<p>No complaints from surrounding residents and businesses</p>	
<p><b>G4 Landscape maintenance</b></p> <ul style="list-style-type: none"> <li>All alien invasive plant species must be removed for disposal at a registered organic waste transfer facility.</li> </ul>	<p>Reduce visual impact</p>	<p>EMP pro forma documentation</p>	<p>As and when required Monitor seasonally</p>
<p><b>G5 Infrastructure maintenance</b></p> <ul style="list-style-type: none"> <li>The Antennae must be maintained in accordance with engineer's specifications.</li> </ul>	<p>Reduce visual impact Minimise pollution of soil, surface and ground water resources</p>	<p>No complaints from surrounding residents and businesses No pollution of the environment</p>	<p>As and when required Monitor as part of a monthly maintenance inspection/schedule</p>

<p><b>G6 Upgrades and renovations</b></p> <ul style="list-style-type: none"> <li>Were civil's contractors or works are required within the development for upgrading and renovation activities, the planning and construction EMP here in must be implemented.</li> </ul>	<p>Contingencies for minimising negative impacts anticipated to occur during construction activities</p>	<p>EMP pro forma documentation</p>	<p>As and when required</p>	
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**ANNEXURE 1**

**METHOD STATEMENT**

**CONTRACT:**.....

**DATE:**.....

**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 sketches and plans where possible): \* Note: please attach extra pages if more space is required



**DECLARATIONS for Method Statement** **1) ENGINEER**

The work described in this Method Statement, if carried out according to the methodology described, is satisfactory to prevent or control environmental harm and is thus approved:

\_\_\_\_\_  
\_\_\_\_\_  
(Signed)

(Print name)

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

**2) CONTRACTOR**

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 and with approval by the Engineer, and that the SHE Coordinator, Construction Manager and ECO will audit my compliance with the contents of this Method Statement

\_\_\_\_\_  
\_\_\_\_\_  
(Signed)

(Print name)

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

**ANNEXURE 2****DECLARATION OF UNDERSTANDING BY THE DEVELOPER**

I, \_\_\_\_\_

Representing \_\_\_\_\_

Declare that I have read and understood the contents of the Environmental Management Plan for:

Contract \_\_\_\_\_

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

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

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

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

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

Witness2: \_\_\_\_\_

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**ANNEXURE 2**

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**DECLARATION OF UNDERSTANDING BY THE ENGINEER**

I, \_\_\_\_\_

Representing \_\_\_\_\_

Declare that I have read and understood the contents of the Environmental Management Plan for:

Contract \_\_\_\_\_

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

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

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

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

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

Witness2: \_\_\_\_\_

**ANNEXURE 3**

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**DECLARATION OF UNDERSTANDING BY THE CONTRACTOR**

I, \_\_\_\_\_

Representing \_\_\_\_\_

Declare that I have read and understood the contents of the Environmental Management Plan for:

Contract \_\_\_\_\_

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications for the aforementioned Contract.

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

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

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

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

Witness 2: \_\_\_\_\_

