Environmental Management Programme (EMPr)

Car Park Extension project at Koeberg Nuclear Power Station on Cape Farm 1552, Duynefontyn

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REV	DESCRIPTION	ORIG	WORLEY-PARSONS APPROVAL	DATE	CLIENT APPROVAL	DATE
1	Updated document	R. Jonas	M Herbert			

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1. INTRODUCTION

The Environmental Management Programme (EMPr) outlines the procedures that control the manner in which the Project Applicant, namely ESKOM, the Project Manager and the Contractors appointed for the various construction activities shall conduct him/herself/themselves whilst undertaking the construction activities for the Car Park Extension project on the Koeberg Nuclear Power Station (KNPS) site.

This EMPr specifies all the potential environmental impacts, control and mitigatory measures, performance criteria and relevant reporting and monitoring procedures. The EMPr forms a crucial part of the conditions for approval and ensures that the Applicant (ESKOM) remains accountable for environmental compliance issues.

A EMPr is intended to define the management measures required to promote positive environmental consequences and reduce adverse environmental impacts potentially generated by the project. A EMPr defines the objectives of such measures and describes how they will be achieved. It must form part of the construction contractual agreements and specification.

1.1 PROJECT BACKGROUND

KNPS performs a refuelling outage approximately every 18 months on each unit (i.e. between one and two outages per year). The outage duration is between 1 and 3 months depending on the work scope. The current car park facilities are inadequate to support the additional outage workforce.

Additionally, to ensure continued operation of the KNPS until 2045, major refurbishment and maintenance of the facility and its associated infrastructure is a necessity. During these major planned maintenance periods, even higher numbers of additional staff and contractors are required on site for the successful completion of these activities. To accommodate the increase in staff and contractor numbers during these outage periods, Eskom has proposed an extension to an existing car park located on the KNPS site (Refer to **Figure 1**). This project will therefore be a direct extension of the existing parking area and will comprise of both paved and gravel parking bays. The gravel parking bays will cater for any overflow, especially when there is an overlap in shifts.

Figure 1: Location of the proposed Car Park Extension project

1.2 SCOPE OF CONSTRUCTION PROGRAMME

The aim of this EMPr is to ensure that all proper controls are in place to address the environmental and social impacts related to the pre-construction and construction phases of the proposed Car Park Extension project.

The Car Park Extension Project will provide an additional **206 permanent (paved) and 212 temporary (gravel) parking bays** with an expected development footprint of approximately **11 000m²**. Refer to **Figure 2** below for the conceptual design layout. This will increase the number of bays at ACP2 from 1015 to 1415 and the total parking available in the ACP1 and ACP2 complex from 1185 to 1585 (a 34% increase).

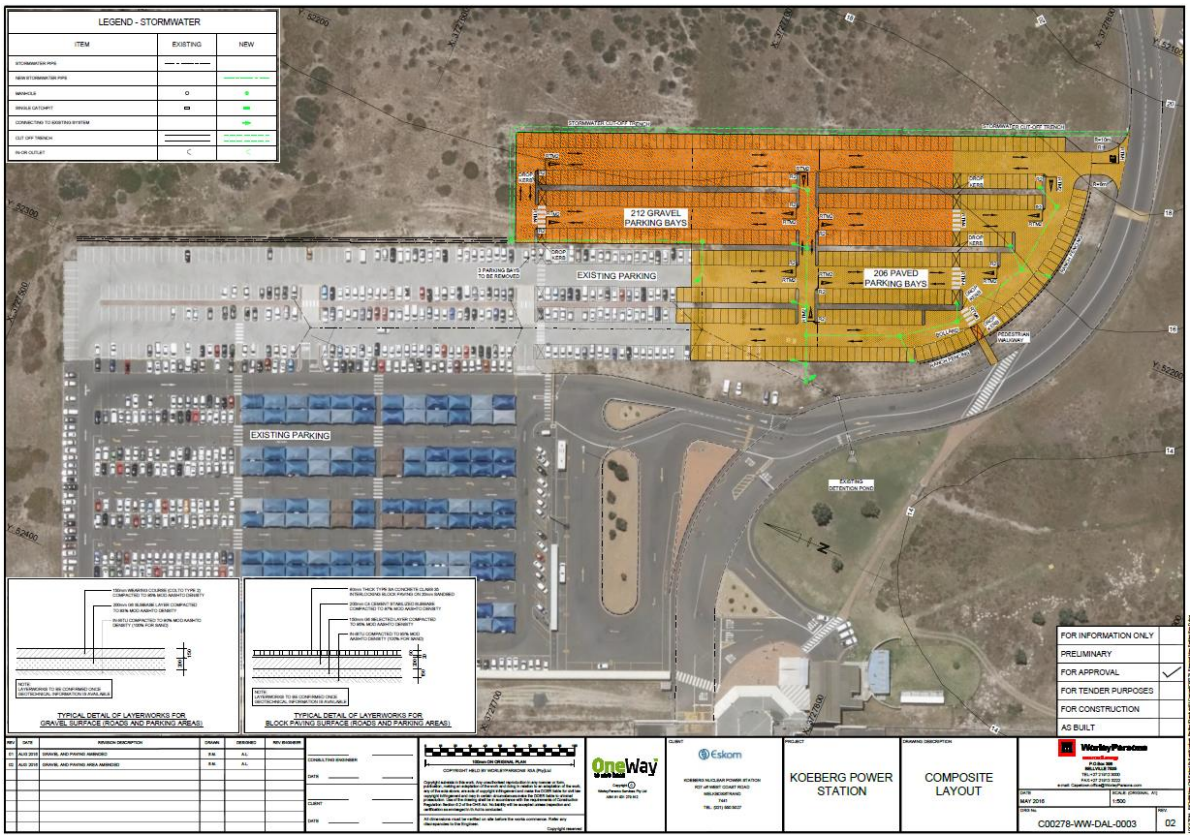

Figure 2: Conceptual design layout for KNPS Car Park Extension project

Detail of works

The construction work for the Car Park Extension project will entail typical layerworks (as used in road construction) with a depth of excavation varying between 380 mm and 500 mm. The deepest excavations (up to 1 m deep) will be required for stormwater drainage areas / channels, but depths may vary slightly, depending on the slope and the subsurface conditions.

As this is an extension (establishment of additional parking bays) of an existing car park, no new bulk services will be required for this development.

2. LEGAL REQUIREMENTS

The conditions of the EMPr as approved by the Authorising Authority in the Environmental Authorisation (attached as **Appendix 1**) are binding on the Applicant (ESKOM) and on all Contractors working on the Car Park Extension project site.

The EMPr is a dynamic document subject to changes related to the Project Specification. Any substantial changes must be submitted to the relevant Authority (namely the Department of Environmental Affairs) in writing for approval.

The construction of the Car Park Extension project must be according to best industry practice, as identified in the project specification. This EMPr, which forms an integral part of all Contract Documents, informs the Contractors/Responsible Persons as to his/her/their duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of negative environmental impact caused by the activities associated with the project.

Appointed Contractors must note that obligations imposed by the EMPr are legally binding in terms of environmental statutory legislation. In the event that any rights and obligations contained in this document contradict those specified in the standards or project specifications, then the latter will prevail.

It is expected that the Contractors are conversant with all environmental legislation pertaining to the Car Park Extension project. In addition all Contractors must also take cognisance of Provincial and Local Government Ordinances and Bylaws, which may be applicable to the Car Park Extension project. City of Cape Town Municipal By-Laws include (but not limited to) Air Pollution Control, Solid Waste Management and Disposal, Stormwater Management and Fire Safety.

3. GENERAL SITE MANAGEMENT

3.1 PROJECT AND ENVIRONMENTAL MANAGEMENT TEAM

The Project Management Team will consist of the Applicant (ESKOM), Project/Site Manager (ESKOM), Environmental Control Officer, Construction Contractor and any associated sub-contractors.

The specific names and contact details of the persons responsible for Site Management during the construction phase of the Car Park Extension project are detailed in **Table 1.**

Table 1: Site Management Contact Details

Designation	Name	Contact details
Applicant / Developer	ESKOM	Velaphi Ntuli Power Station Manager Tel: 021 522 3849 E-mail: NtuliV@eskom.co.za
Project Manager	*ESKOM*	Mawethu Pemba Project Manager Tel: 27(0)21 550 5685 E-mail: PembaM@eskom.co.za
Environmental Control Officer (ECO)	*Still to be appointed*	
Occupational Health and Safety Officer	*Still to be appointed*	
Construction & Maintenance Contractor	*Still to be appointed*	
Archaeologist/ Heritage specialist	ASHA Consulting (Pty) Ltd.	Dr Jayson Orton Tel: 021 788 8425 Cell: 083 272 3225 E-mail: jayson@asha-consulting.co.za
Botanical Specialist	Bergwind Botanical Surveys & Tours CC	Dr David J. McDonald Tel: 021-671-4056 E-mail: dave@bergwind.co.za
Traffic Specialist	HHO Africa - Infrastructure Engineers	Stef Naudé Tel: 021 -425 -2870 E-mail: stef@hho.co.za

3.2 COMMUNICATION, RESPONSIBILITIES AND COMPLAINTS MANAGEMENT

3.2.1 General Public

It is the responsibility of the applicant, ESKOM to facilitate interaction with the general public.

This responsibility includes:

- Informing the residents and land owners surrounding the KNPS of the intent to commence with the construction of the Car Park Extension project and in doing so provide background information as to the expected duration of the project, the working hours as confirmed in this document and necessary contact details of the Site Management;
- Responding to all public, Eskom Staff complaints or queries whether such complaints are received by the Project/Site Manager, ECO and or the appointed Contractors;
- Develop and maintain a register of all public complaints queries, as well as the Applicant's (ESKOM) response to these complaints and queries; and
- Respond to the media and prepare media reports should such requests be received.

3.2.2 Contractors

Method Statements

Written submissions by the Contractor must be prepared prior to any activity occurring on site if requested by the Applicant, Project Manager or ECO, or for construction activities not addressed in this EMPr. The submission will include the plant or equipment to be used as well as materials, labour and methods to be used to undertake the activity.

- The method statement must be completed in such detail that the Project/Site Manager is enabled to assess whether the Contractor's proposal is in accordance with the environmental objectives set. The format for such a method statement should follow the following format and include the following information:
    1. **What?** A brief description of the project;
    2. **How?** A detailed description of the process of work, methods and materials; and where material will be stored;
    3. **Where?** A description/sketch map of the locality of work (if applicable); and compliance/ noncompliance with the specifications;

4. **When?** The sequencing of actions with due commencement and completion date estimates (duration of the activity);
5. **Who?** The names of the person/s or companies who are going to undertake the work; and
6. **Why?** An explanation of the reason why the work needs to be carried out.

- Liaise directly with the Applicant, Project/Site Manager regarding any queries concerning the EMPr or complaints received from the general public;
- Liaise directly with the Project/Site Manager should any environmental problems be identified or actions in breach of the objectives set, take place e.g. littering, oil spill; and
- Carry out instructions issued by the Project/Site Manager.

3.2.3 Project Applicant

The Project Applicant's (ESKOM) responsibilities include the following:

- Attain all necessary legislative and regulatory approvals for the Car Extension Project;
- Adherence to conditions stipulated in the **Environmental Authorisation (EA), Koeberg Nature Reserve Management Plan**, **the City of Cape Town (CoCT) Municipal By-Laws and Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) noise, pollution and air quality guidelines;**
- Inform the relevant authorities of any site-related problems that may occur during the construction phases of the project,
- Attend Contractor site meetings;
- Liaise with the Contractor's Site Manager regarding environmental management on site; and
- Assist the Contractor's Site Manager in making decisions and finding solutions to environmental problems that may arise during the construction phase.

3.2.4 Local Authorities

The Local Authorities (i.e. CoCT) and Provincial Authorities (DEA&DP) responsibilities include the following:

- Attend site meetings (when deemed necessary);

- Liaise with the Project/Site Manager and ECO regarding environmental management on site; and
- Assist the Applicant, Project/Site Manager in making decisions and finding solutions to environmental related problems that may arise during the construction phase.

3.2.5 Contractor's Site Manager

The Site Manager's responsibilities include the following:

- Ensure that the requirements as set in the approved EMPr and the EA are adhered to by the Contractor conducting the works;
- The Site Manager must attend site meetings where required to be to any environmental issues, and be issued with copies of minutes of such meetings; and
- The Site Manager must obtain, examine and approve method statements where applicable.

The Site Manager has the authority to stop works if in his/her opinion there is a serious threat to, or impact on the natural and/or social environment as a result of the construction activities. This authority is to be limited to emergency situations where consultation with the applicant and/or contractor is not immediately possible. In all such work stoppage situations the Project/Site Manager is to inform the applicant and contractor of the reasons for the stoppage as soon as possible.

Upon failure by the Contractor to show adequate consideration to the environmental aspects of this contract, the Project/Site Manager may recommend having the contractor's representative or any employee/s removed from the site or suspend work until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the responsible Contractor.

3.2.6 Environmental Control Officer

The Environmental Control Officer's responsibilities include the following:

- The ECO must ensure compliance with the approved EMPr and the conditions stipulated in the Environmental Authorisation (**Appendix 1**) for the proposed Car Park Extension development;
- The ECO will complete inspections **1X week** within the first month; and **there after 2X month** for the remainder of the project;
- The ECO will monitor the Contractor's environmental compliance to the conditions specified in the EMPr, Koeberg Nature Reserve Management Plan and EA and document this

compliance in a **monthly environmental audit report** during the construction phase of the project for submission to the Applicant (Eskom) and Local Authorities (namely DEA&DP and CoCT);

- The ECO must also be contacted on an ad hoc basis if any emergencies occur;
- The ECO must monthly attend site meetings where required to be able to report on, and respond to, any environmental issues, and be issued with copies of minutes of such meetings;
- The ECO must obtain, examine and approve method statements where applicable;
- The ECO must manage and keep a detailed photo record of all site inspections;
- Advise the applicant, Project/Site manager and Contractor on environmental issues within the defined work area;
- Recommend corrective action where there is non-compliance with the EMPr;
- Keep an up to date diary of site activities; and
- Compile an environmental **site-close out report** during once the construction phase has been completed (for submission to namely DEA, DEA&DP and CoCT).

The ECO has the authority to stop works if in his/her opinion there is a serious threat to or impact on the environment as a result of the construction activities. This authority is to be limited to emergency situations where consultation with the Project/Site Manager or Applicant is not possible immediately. In all such work stoppage situations the ECO is to inform the Project/Site Manager and Applicant of the reasons for the stoppage as soon as possible.

Upon failure by the Contractor or his employee to show adequate consideration to the environmental aspects of this contract, the ECO may recommend to the Project/Site Manager to have the Contractor's representative or any employee/s removed from the site or work suspended until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the responsible Contractor.

3.2.7 General

Environmental Awareness

The Contractor Team on the Car Park Extension site are to be briefed on their obligations towards environmental controls and methodologies in terms of this EMPr and conditions of the Environmental Authorisation and the Koeberg Nature Reserve Management Plan prior to work commencing.

Site Instruction Entries

The site instruction book will be used for the recording of general site instructions as they relate to the works on site. It will also be used for the issuing of stop-work orders, for the purposes of immediately halting any particular activities of the contractor *in lieu* of the environmental or social risk that they may pose.

Public Communications Register

The Project/Site Manager/Applicant will develop and maintain a public communications register to log all complaints and queries raised by Eskom Personnel and Public for the duration of the construction phase of the Car Park Extension project. The response to these complaints and queries must be included in the register.

4. ENVIRONMENTAL MANAGEMENT DURING THE PRE-CONSTRUCTION, CONSTRUCTION PHASES, OPERATIONAL AND DECOMISSIONING PHASES

The Pre-Construction Phase refers to the period following final project planning and the tender phase, leading up to, but not including, the establishment on site by the appointed Contractor.

The Construction Phase refers to the period of the Car Park Extension project during which the actual Works are carried out, deemed to include site establishment and site Works.

The Operational Phase refers to the completion of works and use of the parking facility.

The Decommissioning Phase refers to the removal of all infrastructure related to the car park facility and rehabilitation of the site to its previous natural state.

4.1 GENERAL

The aim of this EMPr is primarily, to identify each environmental aspect of the proposed Car Park Extension project and plan the activity in such a way that negative environmental and social impacts are prevented from happening or mitigated. In the event of an environmental spillage or accident, Contractors must immediately apply approved measures that will limit and contain the magnitude, duration and intensity of the impact.

Contractors must demonstrate that they are capable of carrying out any repair and reinstatement of the damaged environment. General good construction practices will play an important part in avoiding negative environmental impacts.

Contractors must submit a Construction Plan (CP) for the site clearance and construction works to the ESKOM Project/Site Manager for approval before any disturbance may commence. This plan must contain a photographic record and land reference of the areas to be disturbed. All construction activities including stockpiling of construction material must be strictly confined to the demarcated areas.

4.2 ENVIRONMENTAL SITE MANAGEMENT

The Construction Plan and Decommissioning plan must clearly indicate the following aspects:

- Car Park Extension area;
- Contractors' laydown area;
- Site office;
- Batching plants/area;
- Roads and access route;
- Solid waste storage sites;
- Chemical site toilet positions;
- Hazardous waste storage area;
- Topsoil stockpiles;
- Construction materials stockpiling area;
- Equipment stores;
- Fuel stores;
- No-Go Areas -Adjacent natural vegetation (situated within the Koeberg Nature Reserve) must be either fenced off or clearly demarcated so that no unnecessary damage to the adjacent habitat occurs.

- Draw up and submit for approval a complete Construction or Decommissioning Schedule. Inform the ECO or Project Manager of any changes to the approved Schedules as submitted.
- Plan to make optimum use of the dry season (October to February) within the Cape Town area for construction or decommissioning works.
- Indicate that the rehabilitation will completed upon the completion of the civils related works.

- Make provision for monitoring and auditing as specified. Ensure that the ECO has access to the site at all times.
- Ensure that the relevant Environmental Awareness training is presented by the ECO before the commencement of construction. Ensure that a Safety Officer and ECO are appointed before the commencement of construction.

The Environmental Specification presented below will be primarily for use during the **pre-construction, construction, operational and decommissioning phases** of the Car Park Extension project. The express purpose of the Specification is to ensure that the construction of the Car Park Extension project will be undertaken within sound environmental standards and to ensure that these standards are properly defined and contractually enforced.

5. SPECIFICATIONS

5.1 SITE ESTABLISHMENT

5.1.1 Demarcation of the site

(Applicable: Pre construction)

The Contractor is to clearly identify and demarcate the extent of the proposed Car Park Extension footprint area and associated works areas (i.e. visible barrier netting).

In sensitive environments, or where access into no-go areas (i.e. **Koeberg Nature Reserve**) takes place, then a perimeter fence must be erected around the works area.

Maintain site demarcations in position until the cessation of construction works.

Do not use the site for any other purpose other than for the proper carrying out of the works under the Contract.

5.1.2 Protection of Flora

(Applicable: Construction, Operational and Decommissioning phases)

The proposed Car Park Extension footprint area and associated works areas must be clearly demarcated or fenced off during the construction and decommissioning phases of the project. The natural vegetation (which is situated within the Koeberg Nature Reserve) adjacent to the Car Park Extension site must be designated as a no-go area for any Contractor activity or vehicle movement so that no unnecessary damage to the adjacent habitat occurs.

5.1.3 Protection of Fauna

(Applicable: Construction and Decommissioning phases)

Barricading of open excavations which are located on or directly surrounding the car park extension site to prevent the ingress (falling in) and injury of wildlife into open pits is compulsory.

5.1.4 **Topsoil conservation**

(Applicable: Construction and Decommissioning phases)

Ahead of all construction and decommissioning phase earthworks, strip the entire available topsoil layer. Stockpile separately from overburden (subsoil and rocky material). In the absence of a recognisable topsoil layer, strip the upper most 300 mm of soil where possible.

Co-ordinate works to limit unnecessarily prolonged exposure of stripped areas and stockpiles. Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / decommissioning phase earthworks in that area.

Strip and stockpile herbaceous vegetation, overlying grass and other fine organic matter along with the topsoil. Do not strip topsoil when it is wet. Store stripped topsoil in an approved location and in an approved manner for later reuse in the rehabilitation process.

5.2 SITE INFRASTRUCTURE

5.2.1 Structures, Site Office, Stores

(Applicable: Construction and Decommissioning phases)

Locate all temporary buildings and structures, including site offices, stores, etc. within predetermined locations as per the approved Construction / Decommissioning Plan.

5.2.2 Contractors camp and lay-down areas

(Applicable: Construction and Decommissioning phases)

Locate all storage areas and materials laydown sites within predetermined zones as per the approved Construction Plan / Decommissioning Plan. Additional areas required by Contractors for laydown and storage must be approved by the ECO and the ESKOM Project Manager. Specifications with regards to the placement of construction camps, as well as a site plan of the construction camp, indicating waste areas, storage areas and placement of ablution facilities should be approved as part of the site development plan.

Keep the camp and all its store and laydown areas secure and neat at all times and employ appropriate access control measures during construction / decommissioning activities.

Clearly indicate which activities are to take place within which area of the site.

Locate all other structures (including site offices, wash bays, stores, substations, etc.) as indicated on the approved Construction Plan / Decommissioning Plan.

Precautionary measures must be taken during the moving of material that has been stored on the ground for a long period to avoid potential snakebite, as this provides suitable habitat for snakes and their prey items (e.g. rats) which may occur within the Koeberg Nature Reserve.

5.2.3 Batching plants

(Applicable: Construction phase)

The existing bunded batching plant on the KNPS site should be utilised (if ready mix trucks are not available to pour cement directly) for the construction phase of this project.

5.2.4 Roads and access

(Applicable: Pre-construction, Construction, Operational and Decommissioning phases)

Only authorised and existing routes must be utilised to access the Car Park site.

Observe and obey speed limits on the KNPS site all times (The speed limit on roads within the KNPS site is 50 km/h and past Access Control Point 1 is 35 km/h).

Construction staff and vehicles must always be aware of the ESKOM staff, pedestrians, cyclists and wildlife utilising the roads and routes on the KNPS site and within the Koeberg Nature Reserve.

Vehicles may not leave the designated roads and tracks and turnaround points will be limited. Maintain all access routes and roads adequately in order to minimise erosion and undue surface damage.

No off-road driving is permitted. Do not permit vehicular or pedestrian access into natural areas of the Koeberg Nature Reserve beyond the work site.

Plan for proper access control where routes pass through pristine / sensitive areas within the Koeberg Nature Reserve, to prevent environmental disturbance of the natural habitat.

5.3 SITE MANAGEMENT

5.3.1 Rubble and waste rock

(Applicable: Construction and Decommissioning phases)

Store building rubble and waste rock at locations as indicated on the approved Construction or Decommissioning Plan. Then rubble and waste rock must be disposed of at the nearest registered municipal solid waste disposal facility (if not later utilised as backfill material).

5.3.2 Solid waste

(Applicable: Construction phase, Operational and Decommissioning phases)

All non-radioactive or general waste generated during the construction and operational phases of the Car Park Extension project, which cannot be reused or recycled, will be disposed of at a licensed municipal facility.

General waste and the non-hazardous portion of construction waste generated by Car Park Extension project will be stored on site and disposed of separately.

Collect all general solid waste in adequate numbers of waste skips located as required on the Site and within the Contractors camp. Where feasible, collect waste paper, glass and metal waste separately and arrange for collection by recycling Contractors.

On-site litter bins must be equipped with a closing mechanism and waste skips with covers to prevent their contents from blowing out and are scavenger proof (especially as the site is located within the Koeberg Nature Reserve). Ensure that personnel make use of the litter bins and waste skips provided. Keep all Work Sites and at the Contractors camp tidy and litter free at all times. Empty litter bins weekly (or as required before they reach capacity).

Where necessary, dedicate a temporary storage area on site for the collection of construction waste. Unless otherwise specified by the ECO, remove stored domestic waste to the nearest registered solid waste disposal facility. Ensure that solid waste is transported properly, avoiding waste spills en-route.

No waste is allowed to be burned on site.

Accurate records of waste volumes generated, received, recovered and recycled must be kept on site by the Contractor and reported to the ESKOM Project Manager applicable local authorities (DEA&DP and City of Cape Town).

5.3.3 Hazardous waste / substances

(Applicable: Pre-Construction & Construction, Decommissioning phases)

Construction waste classified as hazardous (as per Category A, Section 15 of Schedule 3 of the National Environmental Management: Waste Act, 2008) which is generated during the construction and operational phases of the Car Park Extension project will be temporarily stored in a designated hazardous waste container or skip until final disposal at a licensed hazardous facility (i.e. Visserhok site).

Keep a record of all hazardous substances stored on site. Store all hazardous substances in secure, safe and weatherproof facilities, underlain by a bunded concrete slab to protect against soil and water pollution. All hazardous substances stored on the car park site must have accompanying Material Safety Data Sheets on file.

Provide portable chemical toilets (to be adequately anchored down with rope to prevent being blown over) at the Work Site. Ensure that adequate numbers of conveniently located site toilets are available at all times in quantities related to the number of users (ratio of 1 toilet per 15 users) unless otherwise stated by local by-laws or legislation.

Maintain and clean site toilets regularly as is required to keep them in good, functional working order and in an acceptable state of hygiene. Records (Receipts) of the servicing of these chemical toilets by a specialist toilet hire company must be collected on a weekly basis and maintained on the site file.

Store hazardous waste as indicated on the approved Construction Plan, in a demarcated hazardous waste skip and designated area.

Ensure compliance with all national, regional and local legislation with regard to the disposal of hydrocarbons, chemicals, solvents and any other harmful and hazardous substances and materials.

Regularly (on a weekly basis) disposal of all hazardous (hydrocarbon contaminated material / soil) at the nearest registered hazardous waste disposal facility, i.e. Vissershok. Hazardous waste disposal sub-contractors must be professional with the required expertise. All documents relating to volumes and types of wastes must be kept on site for inspection and record purposes.

Contain chemical spills, and arrange for clean-up / control by the supplier, or by professional pollution control personnel (for the Contractor’s expense).

5.3.4 Pollution control

(Applicable: Pre-Construction, Construction and Decommissioning phases)

Duty of care should be exercised in accordance with the National Environmental Management Act (NEMA) Section 28 in order to avoid pollution. An oil spill kit (i.e. DRIZIT wheely bin) must be allocated to the site in the advent of a hydrocarbon spill onto exposed soil.

Do not locate any depot or containers with any hazardous substance which causes or is likely to cause pollution within the vegetation line of the Koeberg Nature Reserve. Do not dump waste, at any time, of any nature, or any foreign material within the Koeberg Nature Reserve vegetation / natural area. Prevent the discharge of water containing polluting matter or visible suspended materials directly into the Koeberg Nature Reserve natural area.

Immediately clean any accidental oil or fuel spills or leakages on the car park site. Do not hose oil or fuel spills into a storm water drain or sewer, or into the surrounding natural environment. Contain oil or fuel spills in water using an approved oil absorbent fibre. Treat soil contaminated by oil or fuel using one of the following approved methods, as per instruction of the ECO:

- Remove the soil to the depth of the contamination and dispose of at a registered Hazardous Waste Disposal Facility.
- Remove the soil to the depth of the contamination, and regenerate using approved bio-remediation methods or replace with clean (uncontaminated) top soil.

Report any major oil or fuel spills to the ESKOM Project/ Site Manager, as well as the relevant Local Authorities (City of Cape Town: Environmental Resource Department and DEA&DP: Directorate Pollution Management). The rehabilitation of contaminated areas must proceed in accordance either with NEMA Section 30 or Activity 12 of the National Environmental Management Waste Act (NEMWA) (Act 59 of 2008).

During the construction phase of the project, carefully control all on-site activities that involve the use of cement and concrete (this applies to areas other than the batching plant). Limit cement and concrete mixing to single sites where possible. Use plastic trays or liners when mixing cement and concrete: Do not mix cement and concrete directly on the ground. Dispose of all visible remains of excess cement and concrete after the completion of tasks. Dispose of in the approved manner (solid waste concrete may be treated as inert construction rubble, but wet cement and liquid slurry, as well as cement powder must be treated as hazardous waste). Contain water and slurry from cement and concrete mixing operations as well as from, batching area wash bays. Direct such waste water into a settlement pond or similar for later disposal. Do not allow the washing of trucks delivering concrete

anywhere but within designated wash bays equipped with runoff containment. Direct such waste water into a settlement pond or similar for later disposal.

The treatment and remediation of spill areas shall be undertaken to the satisfaction of the Engineer/ECO. All accidental spill treatment and remediation shall require a Method Statement.

The source of the spillage shall be isolated. The Contractor shall contain the spillage using sand berms, sandbags, pre-made booms, sawdust or absorbent materials. Cordon off and ensure safety of the spillage area. Notify the ECO and the ESKOM Project / Site Manager. Any major oil spill must be reported and dealt with in accordance to Section 30 of NEMWA. All local authorities (City of Cape Town and DEA&DP) must be informed in line with the Act. Clean up and remediation should proceed as soon as possible.

5.3.5 Implements and equipment

(Applicable: Construction phase and Decommissioning phases)

Make use of mobile plant and equipment which is appropriate to the task in order to minimise the impact on and extent of damage to the environment on the car park site. Such may include (but is not necessarily limited to) the following:

- Excavator / back-actor for trenching and digging holes (unless in sensitive areas, where it will be specified that this be done manually).
- Front end loader / bulldozer / scraper / bobcat for earthworks, trimming and shaping. Final shaping may be done manually.
- Water cart for water provision plus sprinkler attachment for irrigation and dust suppression.
- Tractor / bulldozer / scraper with ripper attachment for ripping.
- Tractor with scarifier attachment for scarifying.
- Light delivery vehicle for the transport of tools, equipment and people (LDV's used to transport people must be fitted with a canopy or have built up backs for the protection of the passengers).
- Power and hand tools for clearing work.

Should ECO at any time determine that the method, mobile plant or equipment utilised by the contractor is unsuitable for the task at hand, or unnecessarily detrimental to the environment, then he/she may specify the use of a suitable alternative.

5.3.6 Air Quality

(Applicable: Construction and Decommissioning phases)

Manage dust resultant from the pre-construction, construction and decommissioning works and fugitive dust (generated by movement of vehicles over dry exposed soil) in an efficient and environmentally sensitive manner and ensuring compliance to the National Dust Control Regulations in terms of the National Environmental Management: Air Quality Act, 2004. Limit the production of dust and damage caused by dust through regular watering of the work areas. It is preferred that non-potable water (ground water from on-site boreholes) is utilised for dust control. It is also preferred that water is not abstracted from any location borehole or other groundwater resources on the KNPS site of Koeberg Nature Reserve for dust control.

5.3.7 Noise control

(Applicable: Construction and Decommissioning phases)

No loud music is permitted on site or at the site camp. Noise levels generated on the site must comply with Western Cape Noise Control Regulations. Eskom personnel working at the KNPS must be informed by the Contractor of construction working hours and of any other activity that may cause a nuisance.

Respond to any complaints on the KNPS premises with regard to noise generated from the Car Park Extension project, taking reasonable action to mitigate the impact. Where complaints cannot be addressed to the satisfaction of all parties, then the Contractor will, upon instruction by the ESKOM Project / Site Manager, provide an independent and registered Noise Monitor to undertake a weekly survey of the noise output levels during the construction phase. Recommendations to reduce noise to legislated levels must be implemented. This may include the implementation of silencers / mufflers on construction vehicles and equipment, construction of temporary noise barriers, earth berms or sound attenuation walls as required.

5.3.8 Fire control

(Applicable: Pre-Construction, Construction, Operational and Decommissioning phases)

Take adequate precautions to ensure that fires are not started as a result of construction, operational or decommissioning activities on the car park site. The Contractor / Eskom Staff will be held liable for any damage to property (especially within the Koeberg Nature Reserve) adjoining the car park site as a result of any fire caused by one of his employees/ staff.

Establish and maintain fire breaks around the work site if as and when specified by the ECO and required by the Koeberg Nature Reserve Management Plan and the local authorities. Do not permit any fires or open flames on or surrounding the car park site, especially during the dry season.

A minimum requirement for construction in a high fire risk area is a water truck or cart. Ensure that the work site, Contractors camp and all living quarters are equipped with adequate firefighting equipment[1]. This includes at least rubber beaters when working in veld areas, and at least one fire extinguisher of the appropriate type irrespective of the site. Take immediate steps to extinguish any fire which may break out on the construction site.

No open fires are permitted anywhere on site. Prevent employees from creating fires randomly outside designated areas. All flammable products to be stored according to the products' storage requirements. Do not store gas and liquid fuel in the same storage area. Do not permit any smoking within 3 m of any fuel or chemical storage area, or refuelling area.

Smoking will only be allowed in designated smoking areas on the KNPS site as approved by the ESKOM Project / Site Manager.

5.3.9 Health and Safety

(Applicable: Pre-Construction, Construction and Decommissioning phases)

The specifications included under this section do not exempt the Contractor from complying with all the Regulations as included in the Occupation Health and Safety Act (Act 85 of 1993) and the ESKOM SHEQ Policy. The Contractor is further referred to this Act and Policy and all its regulations.

The safety of all construction personnel, as well as any ESKOM staff or member of public on the within the close proximity to the car park site is the responsibility of the Contractor. An Occupational

[1] In terms of SABS 1200.

Health and Safety Officer will be on site, and must be trained in the required first aid courses and all necessary medical supplies must be available.

Ensure that first aid / emergency facilities / procedures are in place on the car park site. Ensure that personnel within the Contractor's Team are trained in basic site safety procedures and first aid. Keep a list of all relevant emergency numbers in an easily accessible location on site. Keep a record of all incidents, accidents and illnesses on site and make the information available at meetings.

Ensure that Personal Protection Equipment (PPE) is worn by Construction Staff at all times on the car park site during the construction and decommissioning phases related to the project. Ensure that employees are issued with and make use of the necessary safety equipment when working in dusty, noisy and / or dangerous situations. Such equipment may include, but is not necessarily limited to hardhats, goggles, masks, earplugs, gloves, safety footwear (as required).

Ensure that adequate drinking water, wash water and sanitary facilities are available at all times and on the work site. Where necessary, provide a designated place for food storage, preparation and consumption on the KNPS site. This should be within a shaded area. Ensure that personnel are transported legally, and in a safe and responsible manner. Ensure that all vehicle and machine operators are qualified and licensed to operate their vehicles / machines.

Protect dangerous excavations or works that may pose a hazard to humans and animals situated within the Koeberg Nature Reserve. Demarcate these areas with hazard tape or fencing as required and post the appropriate danger signs. Respect workers' right to refuse work in unsafe conditions.

All staff should be subjected to an induction where they are taught appropriate prevention steps to avoid being bitten by a snake originating from the Koeberg Nature Reserve. Furthermore, they should be trained on the correct procedure for first aid treatment of snakebite.

5.3.10 Emergency Incidents

IIn terms of Section 30 of the National Environmental Management Act, 1998 (Act No. 107 of 1998). any emergency incidents (i.e. major spillage of fuel from a breached fuel tank) on the car park site, the Contractor and ESKOM must ensure the following procedures are followed on site:

- Take all reasonable measures to contain and minimise the effects of the incident, including its effects on the environment and any risks posed by the incident to the health. safety and property of persons;
- Undertake clean-up procedures;
- Remedy the effects of the incident; and
- Assess the immediate and long-term effects of the incident on the environment and public health.

5.4 EARTHWORKS

5.4.1 Excavations and trenches

(Applicable: Construction and Decommissioning phases)

Undertake excavations carefully, incorporating appropriate drainage. Excavate and backfill trenches on a progressive basis. Excavations left to stand open over night must be clearly barricaded with solid barriers that will prevent large animals from being injured and prevent small animals from getting stuck. Barricading must be solid and must be secured to prevent them from blowing over in strong winds.to prevent any injuries, especially at the end of a work day. Excavations should preferably be opened and closed on the same day. Programme excavation to take place once the required materials are on site. This facilitates the immediate laying of services and / or construction of subsurface infrastructure and minimises open trench time.

Trenching through drainage lines may only be undertaken upon instruction by the ECO. In such a situation be sure to return the profile of the drainage line to one similar to the pre-construction profile.

5.4.2 Shaping and trimming

(Applicable: Construction and Decommissioning phases)

Execute bulk (shaping) and fine (trimming) earthworks according to the approved civil engineering layout design (aimed at the prevention of soil erosion and ultimately achieving aesthetically acceptable landscapes).

Plan shaping and trimming operations to allow for topsoil application: final trimmed levels must make provision for the specified depth of reapplied topsoil. Leave trimmed surfaces slightly rough to facilitate topsoil binding for the natural establishment of vegetation. Where machine operations are not practicable, trimming must be carried out using hand tools.

5.5 STOCKPILES, STORAGE AND HANDLING

5.5.1 Topsoil

(Applicable: Construction and Decommissioning phases)

Topsoil from within the car park extension development footprint should be stripped to a depth of 300 mm and stored within the approved locations indicated on the Construction Plan or Decommissioning Plan. Topsoil is to be handled twice only – once to strip and stockpile, and once to replace and level. Any additional topsoil stockpile areas required by the Contractor must be approved by the ECO, in the form of an amended Construction Plan indicating the position and extent of thereof. Position topsoil stockpiles on the higher side of a disturbed area, and above a 1:50 year flood line wherever possible.

Do not stockpile topsoil in drainage lines. Do not stockpile topsoil in heaps exceeding 2 m in height. Protect topsoil stockpiles from wind (cover with hessian sheeting) and storm water erosion. Remove exotic / invasive plants and weeds that emerge on topsoil stockpiles. If topsoil is to be stockpiles for extended periods, especially during the wet season, then the ECO may recommend one of the following measures:

- The re-vegetation of the stockpiles with indigenous grasses (to be confirmed by the ECO).
- The covering of the stockpiles with a protective material such as hessian sheeting.

Ensure that topsoil is at no time buried, mixed with spoil (excavated subsoil) rubble or building material, or subjected to compaction or hydrocarbon contamination (emanating from vehicles or machinery). This will render the topsoil unsuitable for use during rehabilitation. The responsible Contractor will be held liable for the replacement of any topsoil rendered unsuitable for use during rehabilitation, for reasons due to his/her negligence or mismanagement on site.

5.5.2 Spoil

(Applicable: Construction and Decommissioning phases)

Position spoil (excavated subsoil) at location(s) as indicated upon the approved Construction Plan or Decommissioning Plan. Any additional spoil storage area required by a Contractor must be approved

by the ECO, in the form of an amended Construction Plan. The following information is required for approval:

- The quantity of material to be stored as spoil.
- The type of material to be stored as spoil (i.e. excavated rock, subsoil etc.).
- The proposed method of storing spoil.

Due to the high incidence of strong winds on the KNPS site (especially during summer months) it is highly recommended that top soil stockpiles are covered with hessian / cloth to prevent wind blowing soil and sand away.

5.5.3 Vehicles and equipment

(Applicable: Pre-construction, Construction, Operational and Decommissioning phases)

Vehicles used during construction, operational and decommissioning phases must have the minimum impact on the environment (Koeberg Nature Reserve) or other road users within the KNPS property. The size, height and weight of the vehicle must be kept in mind.

Regularly maintain and service vehicles, machinery and equipment to ensure that none have leaks or cause spills of oil, diesel, grease or hydraulic fluid. No vehicles or equipment with leaks or causing spills may be allowed to operate on park on the site. These must be sent for repair or removed from site. Ensure that the maintenance of all vehicles and equipment, including oil and lubricant changes, takes place only within properly equipped, bunded maintenance areas or workshops. Only emergency and essential repairs of vehicles and equipment may take place outside of these areas.

Provide drip trays for generators, vehicles or any machinery that will be in position for longer than one day (24hrs) over exposed soil surfaces. Drip trays are to be watertight, and must be emptied regularly and before rain events. The contents of drip trays are to be treated as hazardous waste.

Day to day parking of vehicles is to be on hard surfacing wherever possible. Where oil and fuel spills are expected, parking is to be on an impervious surface with adequate pollution control mechanisms (i.e. oil traps/ sumps) in place.

5.5.4 Fuel

(Applicable: Pre-construction, Construction and Decommissioning phases)

Position long term fuel stores as indicated on the approved Construction or Decommissioning Plan.

Store fuel at temporary depots within a bunded area, or alternatively in an area underlain by heavy duty PVC sheeting and covered with 100 mm of sand. This is to include an area adjacent to the tanks upon which vehicles must park during refuelling.

Store all fuel at long term depots within a designated bunded area, underlain by a concrete slab, sloped towards an oil sump for spillage removal. The bund must be able to accommodate 110% of the full volume of one of the containers.

Provide impervious surfacing adjacent to fuel tanks, upon which vehicles must park during refuelling. This will help to accommodate fuel spills during refuelling.

The only permitted method of fuel transfer is by means of a pump / controlled valve / tap / hose / funnel.

Treat spills within the bund and the contents of the sump as hazardous waste.

5.6 EROSION CONTROL

5.6.1 Erosion protection

(Applicable: Construction and Decommissioning phases)

Protect all areas potentially susceptible to erosion and ensure that there is no undue soil erosion resultant from construction and decommissioning activities within and adjacent to the Car Park Extension site.

Retain natural shrubbery and grass species wherever possible. Do not permit vehicular or pedestrian access into natural areas (especially within the Koeberg Nature Reserve) beyond the demarcated boundary of the site.

Do not allow erosion to develop on a large scale before effecting rehabilitation. When in doubt, seek advice from the ECO. Repair all erosion damage as soon as possible to allow for sufficient rehabilitation growth.

5.6.2 Control of alien vegetation

(Applicable: Construction, Operational and Decommissioning phases)

Identify, locate and map all exotics and invasive plants to be eradicated within and directly surrounding the car park extension site. Follow manufacturers' instruction when using chemical methods, especially in terms of quantities, time of application etc. The Botanical assessment identified the presence of the following exotic weed species on site, namely:

- *Bromus cf. diandrus,*
- Turknael (*Erodium moschatum*),
- Small mallow (*Malva parviflora*), and
- Kaapse dubbeltjie (*Emex australis*).

Ensure that only properly trained people handle and make use of chemicals.

Rehabilitate all identified areas as soon as practically possible, utilising specified methods and species.

6. REHABILITATION PHASE

The Rehabilitation Phase refers to the period of the project after the completion of the actual construction or decommissioning works, the onset signalled by site clean-up, site rehabilitation, the withdrawal of the contractor from the site, and coinciding with the maintenance period.

6.1 REHABILITATION POST - CONSTRUCTION / DECOMMISIONING PHASE

The Contractor is liable to rehabilitate any disturbed areas and must submit methods statements for rehabilitation of the site to the Project/Site Manager and ECO for approval. The site must be top soiled and re-vegetated with plant species indigenous to the Koeberg Nature Reserve. Rehabilitation must occur in a progressive manner, i.e. re-vegetation of disturbed sites must be undertaken as soon as construction or decommissioning activities on the site has been completed.

6.1.1 Inert waste and rubble

Clear the site of all inert waste and rubble, including surplus rock, foundations and discarded concrete aggregates. Load and haul excess spoil and inert rubble to dump sites indicated / approved by the

ECO. Remove from site all domestic waste and dispose of in the approved manner at a registered waste disposal site.

Accurate records of waste volumes generated, received, recovered and recycled must be kept on site and reported to the relevant authorities.

6.1.2 Hazardous waste and pollution control

Remove from the car park site all hazardous waste and dispose of these substances at a registered hazardous waste facility (i.e. Visserhok). Take care to avoid leaks, overflows and spills and dispose of any waste in the approved manner.

Accurate records of hazardous waste volumes generated, received, recovered and recycled must be kept on site and reported to the relevant authorities.

6.1.3 Final shaping

Backfill all excavations with *in situ* material which occurs naturally within the Koeberg Nature Reserve. The final shaping shape of the ground should mimic the natural topography of the surrounding landscape (and Koeberg Nature Reserve).

7. SITE SAFETY AND SECURITY

(Applicable: Construction, Operational and Decommissioning phases)

7.1 RESPONSE PROCEDURES

The safety of people is the primary concern of ESKOM. The emphasis will be on preventing possible incidents. **Table 2** provides a list of telephone numbers to be used for emergency purposes.

Table 2: Emergency Response Contact Details

Contact Person / Emergency Response	Contact No.
ESKOM Project Manager:	Mawethu Pemba Tel: 021 550 5685 E-mail: PembaM@eskom.co.za |
ESKOM Security Officer	Martin Krause Tel: 021 550 4036 Cell: 083 712 4714

	E-mail: martin.krause@eskom.co.za
ECO: (*to be confirmed once appointed*)	Tel: - Cell: -

8. MANAGEMENT OF ARCHAEOLOGICAL AND PALAEONTOLOGICAL FINDS

(Applicable: Construction and Decommissioning phases)

There is a potential for direct negative impacts to buried archaeological and/or palaeontological resources to occur during construction or decommissioning activities on the car park site.

The thick layer of *ex situ* material across the bulk of the site renders it of low heritage sensitivity. It is thus recommended that the proposed car park construction proceed but subject to the following points being incorporated into the conditions of authorisation:

- A briefing session for the ECO and relevant project staff must be carried out prior to commencement of earthworks so that any isolated fossils seen (during construction decommissioning activities) can be collected and retained. Such material would need to be given to a palaeontologist for description and accessioning in an approved repository; and
- If any substantial archaeological or palaeontological material or human burials are uncovered during construction or decommissioning activities then work in the immediate area should be halted. The find would need to be reported to the heritage authorities and may require inspection by an archaeologist or palaeontologist. Such heritage is the property of the state and may require excavation and curation in an approved institution.

9. MONITORING AND AUDITING

In keeping with current environmental and associated legislation, all environmental management procedures and actions implemented on the car park extension site should be reviewed and refined on an on-going basis. This is in accordance with the dynamic nature of environmental management and allows for the timeous identification and mitigation of issues as they come to light.

9.1 MONITORING PROCEDURES

(Applicable: Construction and Decommissioning phases)

Environmental Monitoring is the continuous evaluation of the status and condition of environmental aspects as detailed in the approval conditions (as contained within the EMPr and EA).

To these ends, the Environmental Control Officer and ESKOM will need to monitor the car park extension site for compliance with conditions specified in the approved EMPr and EA.

Environmental Audit reports must be completed and submitted on a monthly basis, with a final site closure report at the end of the construction and decommissioning phases of the project.

Regardless of which technique is used, the ultimate aim is that each environmental management specification be checked by means of a system in which a score may be allocated for:

- Full compliance,
- Satisfactory performance,
- Unsatisfactory performance and
- No action.

9.1.1 Record Keeping

All records related to the implementation of conditions within this EMPr (e.g. site instruction book, Site Manager Diary, method statements) must be kept together where it is safe and can be retrieved easily. These records should be kept for submission to the relevant authorities (DEA, CoCT and DEA&DP) if so requested.

9.1.2 Photographs

It is recommended that photographs are taken of the site prior to, during and immediately after construction and the decommissioning activities as a visual reference. These photographs should be included in the monthly Environmental Audit Reports and filed with other records related to this EMPr.

10. TOLERANCE

10.1 FINES

Fines may be issued by the appointed ECO for the transgressions listed below. The ESKOM Project/Site Manager will inform the responsible Contractor of the contravention and the amount of the fine, and will deduct the amount from monies due under the Contract.

A	Any person, vehicles, plant, or thing related to the Contractors operations within the designated boundaries of a "no-go" area (i.e. within a natural area in the Koeberg Nature Reserve).	R 4000
B	Any vehicle driving in excess of designated speed limit on the KNPS property (50km/h, and 35km/h past Access Control Point 1)	R 1000
C	Any vehicle being driven, and items of plant or material being parked or stored outside the demarcated boundaries of the site	R 2000
D	Any person walking outside the demarcated boundaries of the site	R 500
E	Persistent and un-repaired oil leaks from machinery. The use of inappropriate methods of refueling such as the use of funnel rather than a pump.	R 3000
F	Litter of site	R 1000
G	Deliberate lighting of illegal open fires on site	R 5000
H	The eating of meals on site outside the defined eating areas. Individuals not making use of the site ablution facilities.	R 1000
I	Dust or excess noise on or emanating from the site.	R 1000
J	Any person, vehicle, item of plant, or anything related to the Contractors operation causing a public nuisance.	R 2000

10.2 PENALTIES

The following penalties are suggested for transgressions:

A	Erosion	A penalty equivalent in value to the cost of rehabilitation plus 20%
B	Oil spills	A penalty equivalent in value to the cost of

		cleanup operations plus 20%
C	Damage to indigenous vegetation	A penalty equivalent in value to the cost of restoration plus 20%
D	Damage to sensitive environments	A penalty equivalent in value to the cost of restoration plus 20%
E	Damage to cultural sites	A penalty to a maximum of R100 000 shall be paid for any damage to any cultural/historical sites

11. MEASUREMENT AND PAYMENT

11.1 ENVIRONMENTAL AWARENESS TRAINING

- The organisation and attendance of the environmental training will be measured as a sum.
- The contractual sum shall cover the time cost of all personnel attending the course, the provision of the venue and for any other operation necessary to comply with the requirements of the environmental awareness courses to the satisfaction of the ECO.

11.2 REFUSE REMOVAL

- The unit of measurement shall be a sum for the removal of refuse.
- The contractual sum shall include the collection of refuse, for providing, maintaining and running the refuse vehicles, refuse bins and special refuse enclosures, and for all loading, unloading and double handling as required.

11.3 SITE DEMARCATION

- The supply, installation and removal at the end of the construction of all temporary fences shall be measured by length for each type of fence scheduled.

11.4 DUST CONTROL

- The unit of measurement shall be a sum for watering and/or straw stabilisation straw stabilisation.
- The contractual sum shall include the cost of obtaining, transporting and applying the water and/or straw stabilisation including supplying and maintaining suitable water browsers.

11.5 FIRE CONTROL

- The compliance with fire control requirements on the KNPS property shall be measured as a sum.
- The contractual sum shall cover the cost of all labour, materials, equipment and any other operation or thing necessary to comply with the requirements including maintenance and replacement of defective or damaged equipment, and refilling.

11.6 "NO GO" AREA DEMARCATION

"NO GO" area demarcation Unit : m

- "NO GO" area temporary fencing / demarcated will be measured by length for each type of fence scheduled.
- The contractual sum shall cover the cost of all labour, materials, plant and equipment necessary for the supply, installation and removal of the temporary fencing or demarcation. .

Appendix 1 ENVIRONMENTAL AUTHORISATION

(Will be appended to the EMPr, once received)

Appendix 2 REZONING APPROVAL

(Will be appended to this EMPr, once received)