



**ESKOM DISTRIBUTION: STANDARD  
ENVIRONMENTAL MANAGEMENT  
PROGRAM (EMP)**

**WIND ENERGY FACILITY SUBSTATION AND 132KV POWER LINE**

**1. Project description**

- Construction of a new substation at a demarcated site (80m x 80m) at the wind energy facility.
- A double circuit 132 kV power line is proposed to connect the new substation at the wind energy facility to the electricity distribution network/grid at the Juno Transmission Substation (outside Vredendal), a distance of approximately 40 km.

**2. Purpose of the Environmental Management Program**

The main purpose of this EMP is to ensure the sustainable management (avoid and/or minimise environmental damage) of the environment whilst the substation and 132 kV power line are being constructed. This EMP must be viewed as a contract document to which all Eskom employees and outside contractors involved in the construction of the proposed substation must be committed to.

Thus the aim of this EMP is to:

- ensure that the construction staff are familiar with the environmental procedures to be followed and comply with all the recommendations made within it;
- ensure that a list of environmental persons involved in the project are given to the construction staff;
- ensure that a monitoring schedule is maintained in which any potential negative environmental impacts are identified;
- ensure that the mitigatory measures are implemented to avoid and/or minimise the identified negative environmental impacts and to enhance the positive impact of the project on the environment; and
- ensure that a monitoring programme is in place that tracks the mitigatory measures that have been implemented.

**3. Roles and Responsibilities**

**3.1. Project Co-ordinator**

The primary responsibility of the Project co-ordinator (PC) is to ensure that the Contractor complies with the environmental specifications in this document.

In addition the PC shall:

- Assume overall responsibility for the effective implementation and administration of the EMP;
- Ensure that the EMP is included in the Contractors contract;
- Ensure that the Record of Decision (RoD) and EMP are given to the applicable Construction Supervisor and the contractors (if utilised);
- In conjunction with the Clerk of Works; undertake regular inspections of the Contractor's site as well as the construction works in order to check for compliance with the EMP in terms of the specifications outlined in this document. Inspections shall take place at least twice a month and copies of the monitoring checklist maintained on file (see Appendix A for copy of the audit inspection protocol);
- Keep a register of major incidents (spills, injuries, complaints, legal transgressions, etc) and other documentation related to the EMP;
- Report to the Environmental Practitioner any problems (or complaints) which cannot first be resolved in co-operation with the Contractor(s);
- Implement recommendations of possible audits;
- Inform Environmental Practitioner of the date of construction at least two weeks in advance, so that the Department of Environmental Affairs and Development Planning can be notified timeously; and
- Ensure construction staff are trained in accordance with requirements of the EMP.

### **3.2. Construction Contractor**

The Contractor shall:

- Ensure that the environmental specifications of this document (including any revisions, additions or amendments) are effectively implemented. This includes the on-site implementation of steps to mitigate environmental impacts;
- Monitor environmental performance and conformance with the specifications contained in this document during site inspections;
- Discuss implementation of and compliance with this document with staff at routine site meetings;
- Report progress towards implementation of and non-conformances with this document at site meetings with the PC;
- Ensure that suitable records are kept and that the appropriate documentation is available to the PC;
- Advise the PC of any incidents or emergencies on site, together with a record of action taken; and
- Report and record all accidents and incidents resulting in injury or death.

Special Mitigatory Measures

- The contractor shall avoid the area demarcated as Knersvlakte Quartz Vygieveld in all instances.

#### **4.1 Restriction of Working Areas**

It is important that activities are conducted within a limited area to facilitate control and to minimise impacts on the natural environment. For this reason the working areas and 'no-go' areas must be identified. Working areas are defined, as those areas required by the Contractor to undertake construction. The Contractor shall ensure that all plant, labour and materials remain within the boundaries of the working area. Only the site designated for the substation should be considered as a working area.

##### **Objective**

- Minimise the impact of construction activities on the surrounding environment.

##### **Aspect**

- Construction activities.

##### **Target**

- No disturbance to the environment adjacent to the proposed substation site or adjacent to the demarcated power line servitude.

##### **Procedure**

- From the outset of construction the working area must be well defined with danger tape or any other appropriate method.
- All staff, vehicles and construction material are to be restricted to the working area.
- Only the area designated for the substation should be considered as a working area.
- Vehicles, if parked on site, must have a clearly demarcated area. Accommodation must be made for oil leaks that may occur from the vehicle sumps. This can be achieved by providing a sump tray for each vehicle or sand that is later removed. The contaminated sand will have to be disposed of at a licensed hazardous disposal site.
- The stockpiling of materials needs to take place within the confines of the substation site and not spill over into natural vegetation on the periphery.
- No construction crew campsites are permitted on the substation site and construction crew must be accommodated in existing accommodation units in formalised and serviced areas.

#### **4.2 Vegetation Management**

Two distinct vegetation types occur on the wind energy facility site, namely Namaqualand Strandveld (Succulent Karoo biome) and the Namaqualand Sand Fynbos (Fynbos biome). The substation is located on Namaqualand Sand Fynbos,

which is found in the interior and lower parts of the site on a series of stabilised dunes and interdune slacks. Soils in this area are less alkaline, and about 60% of the species are the same as those found in the Strandveld. This vegetation type is listed as Least Threatened in the NSBA, with 98% remaining, and a conservation target of 29% (1% currently conserved). At least one Red Data Book listed species was found in this area, in significant numbers, and the habitat is regarded as more sensitive than the Strandveld area from an erosion and regional botanical point of view.

Vegetation types crossed by the proposed power line alternative include Namaqualand Strandveld, Namaqualand Sand Fynbos, Namaqualand Riviere, Namaqualand Spinescent Grassland, Vanrhynsdorp Gannabosveld and a small portion of Knersvlakte Quartz Vygieveld. Of these, the only potentially sensitive vegetation type in terms of the NSBA analysis (Rouget et al 2004) is the Knersvlakte Quartz Vygieveld. Namaqualand Strandveld, Namaqualand Sand Fynbos, Namaqualand Riviere, Namaqualand Spinescent Grassland are not considered to be a threatened ecosystem, and all have large untransformed portions within the Knersvlakte or on the Namaqualand coastal plain.

The Knersvlakte Quartz Vygieveld in the vicinity of the proposed power line route contains significant patches of vegetation consider to be of very high sensitivity. Typical white quartzite pebble patches are the main feature of importance, although there also some unusual outcrops of virtually black rock. The quartz patches support a very high density of rare, threatened and localised plant species, most of which are bulbs and dwarf succulents. From a distance the areas may look totally devoid of plant life, but actually this is a high diversity habitat, and one that it very sensitive to any form of disturbance at all, as the dwarf succulents are easily crushed. This habitat type is one of the two most important habitats with the Knersvlakte Biosphere Reserve, and supports well over 50% of the 225 or so Knersvlakte endemic plant species.

**Objective:**

- To minimise damage to vegetation.

**Aspect**

- Clearing of substation site and substation construction activities.
- Clearing of centre line and power line construction activities

**Target**

- Minimize disturbance to vegetation.
- No fires are permitted on site.

**Procedure**

- From the outset of construction the site boundary should be well defined with danger tape, or any other appropriate method.
- No picking of flowers, such as proteas and pincushions, on the site or surrounding area.
- An access route, which would have to pass through fynbos vegetation must be clearly demarcated. Vehicles are not to deviate from this route and must not be driven through the veld surrounding the proposed site.

- The stockpiling of materials needs to take place within the confines of the substation site and not spill over into natural vegetation on the periphery.
- Bush clearing should be limited to the area required for the substation and must be done under the supervision of the Contractor.
- Bush clearing must be undertaken in accordance with Eskom's standard (Reference: EPC 32-247).
- Small to medium sized alien plants should be hand-pulled. Loppers should be used to cut plants that cannot be pulled out by hand to below ground level. This needs to be done in order to prevent resprouting.
- Stump treatments (only a certified Pest Control Officer may be appointed) should be applied to larger sized trees where necessary.
- The use of herbicides must be done according to Eskom's Standard for the safe use of pesticides and herbicides (reference: ESKASAALO).
- Invasive plants must be controlled (both invasive plants and weeds must be identified and controlled in such a manner that it is prevented from spreading).
- Herbicide spraying of resprouting species should be undertaken immediately to minimize regrowth.
- All bush cuttings must be removed from the site and disposed of at a licenced landfill site.

### **4.3 Oil Spill Management**

#### **Objective**

- Prevent potential oil spills during the construction of the proposed substation and power line.

#### **Aspect**

- Construction activities.

#### **Procedure**

- Accommodation must be made for oil leaks that may occur from vehicle sumps. This can be achieved by providing a sump tray for each vehicle or sand that is later removed from site. The contaminated sand will have to be disposed of at a licensed hazardous disposal site.
- All oil spills must be reported to the environmental department within 24 hours of the spill via a flash report.

- The contractor should be in possession of a mobile oil spill kit and/or a wheely bin should be available on site.
- A mobile kit can be acquired from Drizit at Tel. No. (021) 531 5335 or Pineland Environmental Technology at Tel. No. (021) 531 3749.
- Ensure that the transformer is located within a bunded area.
- The Waste Management Procedure: Annex D (Reference – EPC 32-245) and Environmental Liaison Committee (ELC) Performance Indicator Reporting Procedure: Annex L (Reference – EPC 32-249) needs to be implemented.

#### **4.4 Access**

Access to the substation is via the access road into the wind energy facility. Access to the power line corridor will be via the existing Juno-Koekenaap 132kV power line access road where these two lines run in parallel. Where the two servitudes deviate, access is via existing gravel access roads. Only where essential will new access tracks be established.

##### **Objective**

- Maintain the access currently used.

##### **Aspect**

- Upgrading of the access road.
- Vehicle access.

##### **Procedure**

- Access to the substation is via the access road into the wind energy facility.
- Ensure that the existing road is maintained.
- Should an additional access route be required, the access must be agreed upon with the relevant property owner in conjunction with the contractor. A written agreement must be in place, **prior** to any construction of the said access route.
- An access route, which would have to pass through fynbos vegetation must be clearly demarcated. Vehicles are not to deviate from this route and must not be driven through the veld surrounding the proposed site.
- Materials such as base course gravels and laterites should, if possible, be stored in areas that will later be built upon and incorporated into the structure.
- Unused materials must be removed from site at the end of construction.
- Should any damage occur to the access road as a result of construction activities, the road should be rehabilitated to its original upgraded state.

## **4.5 Fauna**

### **Objective**

- Prevent and minimise impact on fauna.

### **Aspect**

- Construction activities.

### **Target**

- Prevent injury and harm to animals.

### **Procedure**

- Demarcate construction activities where possible to prevent accidental injury and harm to domestic animals.
- Animals, such as snakes or lizards, need to be captured, removed from the substation site and released at an appropriate place.
- Cape Nature must be contacted to remove the tortoises before the footprint of the substation is cleared.
- There shall be no pilfering of domestic animals.

## **4.6 Soil Erosion**

### **Objective**

- Prevent soil erosion.

### **Aspect**

- Construction activities and vehicle movement.

### **Procedure**

- Vehicles to use the current access route.
- All construction activities to be undertaken within the working area (i.e. within the area designated for the substation).

## **4.7 Use of cement/ concrete**

The Contractor is advised that cement and concrete are regarded as highly hazardous to the natural environment on account of the very high pH of the material, and the chemicals contained therein.

### **Objective**

- Prevent pollution to the ground.

## **Procedure**

- Concrete shall be mixed on mortar boards, and not directly on the ground.
- The visible remains of the batch plant and concrete, either solid, or from washings, shall be physically removed immediately and disposed of as waste in a recognised landfill site.
- Washing the visible signs into the ground is not acceptable.
- All aggregate shall also be removed.

## **4.8 Refuse and Waste Management**

Refuse and waste refers to all solid waste, including construction debris (wrapping materials, timber, cans etc), waste and surplus food, food-wrappers, etc.

### **Objective**

- Limit the potential for site pollution and the accumulation of waste materials on site.

### **Aspect**

- General construction activities.

### **Target**

- No waste and/or refuse is to be stored on site for longer than 2 months.
- All waste must be removed off site and dispose of at a licensed landfill site.

### **Procedure**

- The Contractor shall not dispose of any waste and/or construction debris by burning or burying.
- The use of waste bins and skips is recommended.
- The bins shall be provided with lids and an external closing mechanism to prevent contents blowing out.
- The Contractor shall ensure that all waste is deposited in the waste bins for removal by the Contractor.
- Bins shall not be used for any purposes other than waste collection and shall be emptied on a regular basis.
- Temporary ablution facilities (i.e. Chemical toilets) must be made available and used.
- Abluting anywhere other than in the toilet facilities available shall not be permitted (i.e. no abluting in the veld).
- Servicing and cleaning of vehicles is strictly prohibited in the access road, the substation site and in the veld.
- All waste shall be disposed of off site at a licensed landfill site.



## **4.9 Archaeological**

### **Objective**

- To ensure that any archaeological findings during the construction process is managed accordingly.

### **Procedure**

- If any archaeological material (e.g. fossils, bones, artefacts etc) is found, the contractor shall stop work immediately and inform the SHE representative.
- The SHE representative shall inform Heritage Western Cape (HWC) and arrange for a palaeontologist/archaeologist to inspect, and if necessary excavate, the material, subject to acquiring the requisite approval from HWC.
- The Contractor shall not recommence working in that area until written permission has been received from the SHE representative.

## **4.10 Noise Pollution**

### **Objective**

- Avoid disturbing the local community.

### **Aspects**

- Operation of construction equipment and vehicle operation.

### **Procedure**

- Where possible the contractor must use equipment which falls within the allowable noise limits.
- All noise generating activities must be scheduled between 6am and 6pm Mondays to Saturdays.
- Any complaints pertaining to noise must be reported to the SHE representative and addressed.

## **4.11 Security Camp (if required)**

### **Objective**

- Manage the impact the security camp has on the environment.

### **Procedure**

- The security contractor is to obtain the permission from the landowner (if not on Eskom property) before the security camp is established on site.

- The security contractor shall provide water and/ or washing facilities at the camp for personnel.
- The security camp shall be kept neat and tidy and free of litter.
- The security contractor shall provide the necessary ablution facilities for all his personnel.
- Chemical toilets shall be used. The toilets shall be secured to prevent them from blowing over, and shall be provided with an external closing mechanism to prevent toilet paper from being blown out. Toilet paper shall be provided in all toilets. The security contractor shall ensure that chemicals and/ or waste from toilet-cleaning operations are not spilled on the ground at any time.
- Abluting anywhere other than in the toilets shall not be permitted.
- Closed fires or stoves shall only be permitted at a designated safe site to be determined by the SHE representative.
- Fires shall also not be permitted near any potential sources of combustion, such as near vehicles, fuel storage area, vegetation etc.
- No smoking will be allowed on site.

#### **4.12 Site Rehabilitation**

##### **Objective**

- To restore any degradation caused by the construction activities.

##### **Target**

- Site rehabilitation to be completed within three months of construction or by an alternative date stipulated by the SHE representative.

##### **Procedure**

- All construction equipment and excess aggregate, gravel, stone, concrete, bricks, temporary fencing and the like shall be removed from the site upon completion of the work.
- No discarded materials of any nature shall be buried on the site or on any other land within the site.

## 5. Environmental Legislation

### 5.1. Introduction

A growing awareness of the environment and an increase in the number of environmental laws and regulations, present company management with a daunting task of monitoring, interpreting and implementing systems to produce a workable plan to comply with legal requirements.

The list below was compiled to ensure that the person responsible for maintenance of the substation is aware of their legal responsibilities and liabilities. Complying with these laws and regulations will minimise the risks in terms of legal, financial (claims) and rehabilitation costs.

Non compliance to environmental law is a criminal offence and if prosecuted Eskom will be liable for any environmental damage incurred.

ACT NAME	ACT NO	NOTES/REMARKS
Atmospheric Pollution Prevention Act	45 of 1965	<p><b>Control all forms of air pollution.</b></p> <p><i>Φ Smoke control zones</i></p> <p><i>Φ Dust control during construction</i></p> <p><i>Φ Fumes emitted by vehicles</i></p> <p><i>Φ Air pollution from waste</i></p>
Conservation of Agricultural Resources Act	43 of 1983	<p><b>Control of utilisation and protection of wetlands; soil conservation; control and prevention of veld fires; control of weeds and invader plants.</b></p>
Environmental Conservation Act	73 of 1989	<p><b>Controls for the effective protection and utilisation of the environment, littering, waste disposal, noise and various other activities, which may have a detrimental effect on the environment.</b></p> <p><i>Φ Waste management</i></p> <p><i>Φ Application of waste disposal permit</i></p> <p><i>Φ Noise control regulations</i></p>
Fencing Act	31 of 1963	<p><b>Prohibition of damage to a property owner's gates and fences</b></p> <p><i>Φ Climbing or crawling over or through fences without permission</i></p> <p><i>Φ Closing gates</i></p>
Forest Act	122 of 1984	<p><b>Control of veld, forest and mountain fires and the protection of biota</b></p>

		<b>and ecosystems.</b> <i>Φ Protected trees</i> <i>Φ Fire control areas</i> <i>Φ Fire belts and maintenance</i>
Hazardous Substance Act	15 of 1973	<b>Sale of Group I,II,III and letting, use, operation, application and installation of Group III hazardous substances.</b>
Health Act	63 of 1977	<b>Control of health aspects of waste disposal and water treatment.</b> <i>Φ Regulates, rubbish, night soil, sewage, or other waste</i> <i>Φ Regulations relating to nuisances</i>
Game Theft Act	105 of 1991	<b>Regulates ownership of game, combat theft and unlawful hunting, catching and taking into possession of game.</b>
National Monuments Act	28 of 1969	<b>Control for the protection of natural and historical monuments, relics and antiques.</b> <i>Φ Notifying of authorities in discovering of above</i>
National Water Act	36 of 1998	<b>All aspects relating to pollution of surface and ground water.</b>
Cape Nature Conservation Ordinance	19 of 1974	<b>Endangered plants and wild animals.</b> <b>Protected fauna and flora</b>

## 6. Generic Conditions

In order to ensure compliance with Eskom's environmental policy as well as environmental legislation requirements, the following generic conditions are applicable:

### 6.1 Air Quality

- No burning of waste material, such as vegetation from any clearing operations is allowed;
- Drive at moderate speeds on the access road in order to minimise or avoid dust pollution.

### 6.2 Water Quality

- Under no circumstances must surface or ground water be polluted. Ground or surface water pollution could occur as a result of spillages or the incorrect usage of oil, petrol, cleaning materials, herbicides, etc.

### **6.3 Land Management**

- All fauna (including domestic livestock) within and around the substation shall be protected. Birds and animals shall not be caught or killed by any means, including poisoning, trapping, shooting or setting of snares. Offenders may be prosecuted in terms of CNC Ordinance 19 of 1974;
- No fences or gates of property owners must be damaged. The condition of Eskom gates and locks must be regularly monitored to ensure they are secure (i.e. to prevent animals getting out or access by unauthorised personnel). The access gates to the substation must always be closed and locked when daily construction activities are completed;
- Soil erosion must be prevented at all times along the access road and in the substation site;
- Bush clearing in the servitude or around the substation must be in accordance to Eskom's Bush Clearing Standard (Reference – ESKASABG3); and
- No bush clearing to be undertaken without the knowledge thereof by the property owner.

### **6.4. Socio-Cultural Issues**

- A plan of action should be drawn up in the case of an emergency (veld fire, damaged powerline, vegetation problems etc.). Eskom contact names and telephone numbers must be available on site;
- Property owners or occupiers must be treated with respect and courtesy at all times;
- The culture and lifestyles of the communities living in close proximity to the substation must be respected;
- Removal (pilfering) of agricultural products is prohibited. Receipts must be obtained for any merchandise purchased or received from landowners;
- Vehicles must be driven carefully in hazardous road conditions (sharp bends, narrow roads, bad weather, children playing on or near the road, domestic animals on or near the road etc.). Vehicle movement should be kept to a minimum during rain to avoid damage to the access road;
- Environmental clauses (as referred to in this EMP) must be included into contract documents for all contractors;
- Tribal graves, archaeological sites and sites of historical interest in close proximity to the substation are to be treated with respect and protected.
- No firewood is to be collected except with the written consent of the landowner; and
- A register must be maintained of all complaints or queries received as well as action taken.

**7. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMP):Monitoring Structure (to be completed by site personnel)**

<b>7.1 Person responsible for the substation and power lines is:</b>
Name:
Designation:

**7.2 Reporting of environmental performance, problems and priorities is as follows:**


**7.3 Environmental monitoring of the substation is according to the following schedule:**


**7.4 The following negative environmental impacts have been identified at the substation:**

<b>Environmental Problem</b>	<b>Location</b>







### **Environmental Contact Persons**

Thandiwe Notshe	021 980 3021
Barbara van Geems	021 980 3242
Ahmed Mohomed	021 980 3008

### **Emergency Numbers**

Eskom Control	080-121-2433 / 915-2440
Fire department (Wolseley)	023 316 1997

### **Oil Spill Contact Numbers**

Drizit	021 531 5335 / 082 455 7832
Pineland Environmental Technology	021 531 3749 / 082 464 1074

## APPENDIX 1

### CONSTRUCTION ENVIRONMENTAL AUDIT CHECKLIST

Name of Powerline / Substation: _____	Date: _____
Name of Auditor: _____	Construction Representative: _____

	AUDIT QUESTION	YES	NO	ACTION	COMMENTS
Vegetation Management					
1	Are the relevant permits available for the cutting of protected trees and indigenous fynbos? i.e. fynbos				
2	Have construction activities remained within the designated working areas?				
3	Has bush clearing been done according to the Procedure for vegetation clearance and maintenance within Overhead Powerline Servitudes and on Eskom owned land (EPC 32-247)?				
4	Have all the bush cuttings been removed from the servitude and substation?				
5	Have all herbicide spraying been undertaken under the supervision of a registered Pest Control Officer.				
6	Was all herbicide usage undertaken according to Eskom's guidelines and the Standard for the Safe Use of Pesticides and Herbicides (ESKASAALO)?				
7	Has one access route been used?				
Oil Spills					
8	Have any oil or diesel spills occurred on site?				
9	Have oil spills been reported to the Environmental Specialist via a flash report within 24 hours of the spills occurring?				

	AUDIT QUESTION	YES	NO	ACTION	COMMENTS
10	Have oil spills been managed according to The Waste Management Procedure: Annex D (Reference – EPC 32-245)?				
11	Is there a stock of oil remediation chemicals on site?				
Erosion					
12	Have any complaints been received from property owners regarding occurrence of erosion on their properties as a result of construction activities?				
13	Were any signs of erosion visible during the audit?				
Topsoil Management					
14	Has all the topsoil been backfilled or levelled on site?				
Fire Management					
15	Are the emergency numbers available on site?				
16	Have any incidents of veld fires occurred?				
17	Are the sufficient fire fighting equipment on site?				
Disturbance to the Natural Heritage Resources					
18	Were tribal graves or archaeological sites identified during the construction activities?				
19	If yes, was construction activities stopped immediately and the Environmental Practitioner contacted?				
20	Was the South African Heritage Resources Agency contacted?				
Property Access					
21	Was permission obtained from property owners before construction commenced?				
22	Were entrance gates, walls and paths rehabilitated to the property owners satisfaction?				

	AUDIT QUESTION	YES	NO	ACTION	COMMENTS
<b>Water Management</b>					
23	Had any incidents of water pollution occurred?				
24	If yes, was a flash report issued within 24hrs to the Environmental Management Department?				
25	Was the incident investigated and recommendations implemented?				
26	Are there sufficient potable water available?				
27	Are there sufficient portable toilets available?				
<b>Social Issues</b>					
28	Were any public complaints registered and actioned?				
<b>Waste Management</b>					
29	Are there sufficient waste bins on site?				
30	Was litter noted during site inspection?				
<b>Use of cement and/or concrete</b>					
31	Was any excess cement or concrete noted during the site inspection?				
<b>Environmental Records</b>					
32	Is a copy of the Record of Decision or a signed copy of the Distribution Environmental Screening Document available on site?				