

Distribution environmental screening document (DESD)
Reticulation Powerlines and Ancillary Services

Ratified and accepted by
Environmental Practitioner
Environmental Specialist
Head of Engineering Survey
(One signature please)

Accepted by Land Owner/s/Users
I have seen the completed document and accept the
recommendations made

Assessor/s

Form completed by: EARL DANIELS Signature: .

in consultation with: ISAK PITIKOE (TSO) 0785294409

ABRAHAM WILLIAMS (TO) 083 4631 832 Signature: .

CAPACITY (e.g. land owner, specialist):

Instructions

1. Fill the report in as neatly and completely as possible.
2. Where the question / statement is not applicable mark N/A.
3. The form must be completed in consultation with someone who knows the area well and who can also predict if any future development is envisaged (e.g. a land owner, land user, specialist, etc.).
4. Indicate sensitive areas on a map and/or spanning plans.
5. When in doubt, consult the Environmental Practitioner in your region.

The purpose of this *DESD* is to:

1. Determine whether or not the project should be subject to R386 or R387, published in terms of the National Environmental Management Act No. 107 of 1998.
2. Identify and mitigate the negative impact of Eskom's activities to a minimum in line with both Legislation and Eskom's Environmental Policies.
3. This report is a guide to Route Selection, Construction and Field Services.

NOTE Complete the report before the survey!!!

This is not an office exercise.

Extra sheets of paper may be added and referenced if insufficient space has been provided.

PROCEDURE FOR ENVIRONMENTAL ASSESSMENT OF RETICULATION AND SUB-TRANSMISSION PROJECTS: ANNEX Q OF CAPITAL INVESTMENT IN THE DISTRIBUTION BUSINESS

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1 Project description

Project name/Survey **PETRUSBURG STEUNMEKAAR 22KV LINE REFURBISHMENT-MAIN LINE AND T-OFF'S**.....

Area: **PETRUSBURG AREA**

Project number BP2008164574944..... File number

Rural scheme/
Feeder PTST Voltage 22KV.....

Supply from **PETRUSBURG SUBSTATION**.....
(Scheme name, pole numbers for tee-off)

Supply to PTST 430
(Farm name, etc.)

2 Properties traversed

Farm name

Registration number and Division Sub-division.....

Compilation number Line length/Site area (m²).....

REBUILD ±43KM 22KV 3 PHASE MINK LINE FROM PETRUSBURG SUBSTATION UP TO PTST 340

Farm name

Registration number and Division Sub-division.....

Compilation number Line length/Site area (m²)

BUILD ±36KM 22KV 3 PHASE FAX LINE TO RE-CONNECT ALL THE EXISTING T-OFFS TO THE NEW LINE

DEMOLISH ± 65KM LINE

2KM BUSH CLEARING TO BE DONE

3 Brief description of the surrounding area

The plain is gently undulating with a few koppies and hills and is covered with dry Highveld grassland with spread shrubs. Mainly agricultural activities in the form of maize, weed, potato, onions and sunflower crop farming. Cattle and sheep farming also occur in the area under study. There are game farming present in the area along the route of the line.....

.....

Could the proposed project have an impact on or be constrained by any of the following environmental aspects?

Encircle the appropriate aspect, giving a description of the present state as well as an indication of the possible negative impact. **Note that mitigating measures for these impacts are to be included in the Environmental Management Programme.**

4 Physical environment

4.1 Water: streams rivers dams wetlands springs floodplains OTHER Marsh, Pans.....

Present condition: There is a **marsh** with water and aquatic grasses, rushes, reeds and low-growing shrubs in it present where the line is crossing farm Brakput 886 (See image 1). **Dry pans** were observed on farms Biesiebult 372, Populierdam 1123, Bathseba 1183, Welkom 360, King Heath 154, Reddersfontein 410, Avenbury 734, Legkraal 65 (See image 2). A **water reservoir** is present on farm Geluk (See image 3). **Farm dams** were also observed along the route of the proposed line on farms Mooivlakte 571, Geluk (See image 4).

Potential impact (e.g. threat of pollution): Water contamination might occur from oil leaking vehicles and equipment during site preparation and construction activities. Contravention of the National water act 36 of 1998 section 21 on water uses if the banks or beds of the waterbodies are altered.

Comments/ mitigation measures: Do not plant poles in the marsh. Use higher structures in order to build long spans over the pans and marshland. Plant poles at least 100m away from the waterbodies. Do not damage or pollute water in farm dams and reservoirs. Refrain from driving through pans and marshland.



Image 1: Marsh on farm Brakput 886



Image 2: Dry pan on farm Legkraal 65



Image 3: Water reservoir on farm Geluk

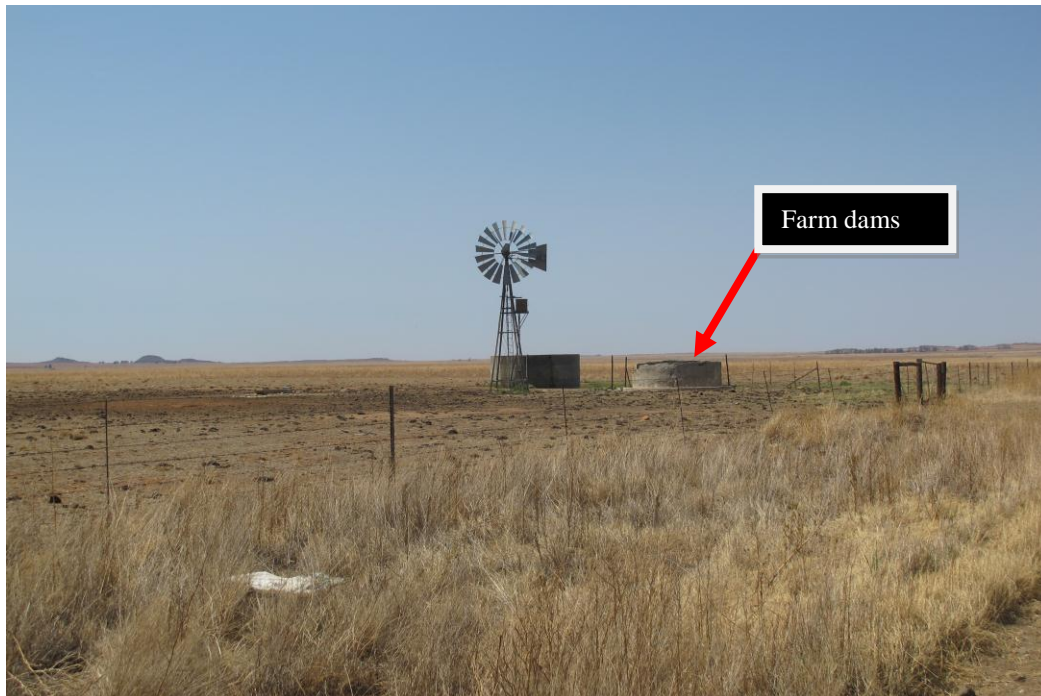


Image 4: Farm dam on farm Mooivlakte 571

4.2 Soil: sandy rocky clayey OTHER Clay-Loamy soil.....

Present condition: Sandstone, shale and siltstone covered with **light to dark red loam sandy soil**. Soil is mainly dry, but wetter at irrigation points which result in it to be clayish (See image 5)

Potential impact (e.g. of erosion): The area can suffer loss of topsoil through soil erosion by wind, water or other causes of erosion. Land pollution can impair on the fertility and composition of soil. The sandiness of soil might cause poles to be unstable frequently which can make maintenance to be costly for Eskom. Vehicular movement and excessive activity on the soil can also accelerate soil erosion.

Comments/ mitigation measures: Drive vehicles at a moderate speed in the area. Refrain from commencing construction activities on highly sandy plains and sand dunes. Do not drive vehicles and trucks through cultivation land in order to minimize loss of top soil. Extract soil in layers when excavating, in order to deposit the soil back into its original layers to keep maximum top soil. Do not litter anywhere.



Image 5: Sand-loam soil at irrigation point on farm Eben Haezer 1040

4.3 Topography: mountains ridges hills valleys ravines dongas OTHER Quarry, Erosion gullies, koppies.....

Present condition: There are hills present on farms Boesman’s put152 (See image 6) and Spitzkop 398. A quarry also occurs along the route of the proposed line on farm Boesmans put 152 (See image 7). An erosion gully is present on the route of the proposed line on farms Rustplaats 240, Vrede 1052, Leeuwberg 465 and Mooivlakte 571 (See image 8)

Potential impact (e.g. of erosion): The presence of hills can accelerate soil erosion. The quarry might erode deeper if vehicular movement or construction takes place inside of it. Erosion gullies might broaden if poles are planted in close range or inside its edges. Eskom structures might be unstable or standing skew as erosion at the gullies proceeds in the direction of the poles.

Comments/mitigating measures: Refrain from commencing with activities or driving vehicles in the quarry. Do not plant poles in close proximity of the erosion gullies. Use long spans with higher structures when crossing the eroded areas with poles far from the edges. Build the proposed line on the other side of the road where erosion gullies cannot be avoided.



Image 6: Hills on farm Boesmans put 152



Image 7: Deep quarry on farm Boesmans put 152

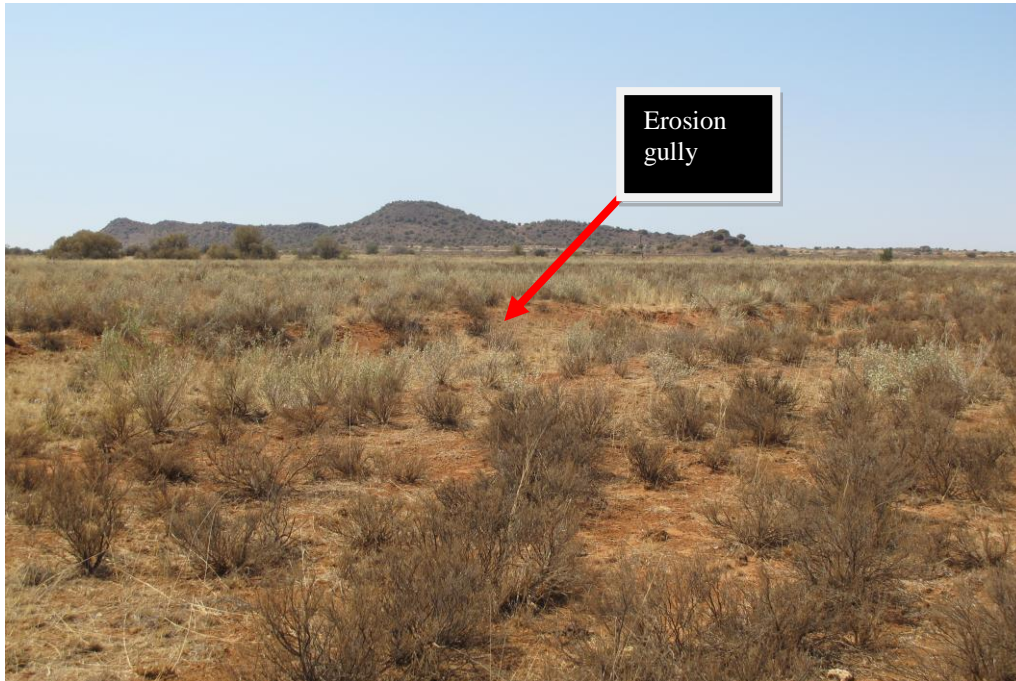


Image 8: Erosion gully next to the road on farm Rustplaats 240

5 Natural environment

5.1 Flora: **indigenous** protected **exotic** OTHER

Brief description and conservation status (e.g. rare, etc., mention trees/bush/grass)

The Dry highveld temperate **grassland** vegetation is present. This is a grassland with a few **Sweet Thorn Acacia karroo trees** occurring only occasionally along water courses (See image 9). Diagnostic grasses include the grasses Lehmann's Lovegrass *Eragrostis lehmanniana*, *E. obtusa*, Small Buffalograss *Panicum coloratum* and *Stipagrostis uniplumis*, and the karroid dwarf shrub, Bitterkaroo *Pentzia globosa*. Other prominent grass species include **Redgrass *Themeda triandra***, Weeping Lovegrass *Eragrostis curvula*, Hairy Lovegrass *E. trichophora*, *Anthephora pubescens*, *Aristida congesta*, *Digitaria eriantha* and *Cynodon dactylon*. A large variety of dicotyledonous forbs are also present, including *Chamaecrista mimosoides*, Poison Apple *Solanum panduriforme*, Tummy Bitterroot *Dicoma anomala*, *Helichrysum callicomum*, *H. cerastioides*, *Kyphocarpa angustifolia*, *Leucas capensis*, *Gnidia capitata*, *Blepharis angusta*, *Anthospermum hispidulum* and *Acalypha angustata*. West of Bloemfontein, affinity to Karoo vegetation can be seen in plant communities dominated by **dwarf shrubs** (See image 10), including Fringed Karee *Rhus ciliata*, Anchorkaroo *Pentzia incana*, Bitterbush *Chrysocoma ciliata*, *Helichrysum pentzioides*, *Salsola kali*, *Felicia muricata*, *Walafrida densiflora*, *W saxatilis* and *Nenax microphylla* (Bredenkamp, G., Granger, J.E. & van Rooyen, N. 1996. Moist Sandy Highveld Grassland. In: Low, A.B. & Robelo, A.G. (eds) *Vegetation of South Africa, Lesotho and Swaziland*. Department of Environmental Affairs and Tourism, Pretoria.)

There are also **bluegum, beefwood, pepper trees** (See image 11) and **poplar trees** observed along the route on farms Eden 893, Helderwater 1145, Transportdam 363, Ebenhaezer 1040 (See image12).

There are also **aquatic grasses, rushes, reeds** present at the marsh at farm Brakput 886 (See image13).

Potential impact (e.g. permit applications): The removal of vegetation cover can lead to loss of top soil and the acceleration of soil erosion. The debris that result from vegetation clearance, cut and trimmed trees can pose as a fire risk on the property of landowners. The loss of grazing land and natural habitat of small mammals and birds living in grassland. Veld fires can also pose danger to Eskom equipment and infrastructure where grasses are long. The legal contravention of cutting or removing protected trees without a permit from the department of environmental affairs

Comments/ mitigation measures: Minimise the removal of vegetation cover during site preparation and construction. Drive with moderate speed in the veldt. Inform the land owner about debris and wood to be

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removed after cutting or trimming trees on the property. Do not cut protected trees if it's found along the route of the proposed line, contact the Eskom FSOU environmental section on (051) 404 2287 to obtain a tree cutting permit from the Department of Environmental affairs.



Image 9: Sweet Thorn Acacia karroo trees



Image 10: Dwarf shrubs

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Image 11: Pepper tree on farm Katdoornpan 367



Image 12: Blue gum and poplar trees on farm Transportdam 363



Image 13: Aquatic grasses, rushes and reets at marsh on farm Brakput 886

5.2 Fauna: **mammals** **birds** OTHER

Brief description and conservation status:

(e.g. rare, protected, etc., mention giraffe, elephants, eagles, vultures, etc., mention migratory paths)

There are **wildcamps** present on the route of the line on farms Boesmansput 152, Ebenhaezer 1040, Hartebeesplaat 1142, Legkraal 65, Reddersfontein 410. There were also **springbucks** observed on farm Whitbourne 730 and Waterbron 68 (See image 14). **Cattle and sheep** were seen grazing on farms Helderwater 1145, Transportdam 363, Katdoornpan 367, King’s Heath 154, Legkraal 65, Reddersfontein 410, Whitbourne 730, Waterbron 68, Leeuwberg 465, Witfontein 652, Mooivlakte 571 (See image 15). **Guinea fowls** on most of the farms along the route. **Wild peacock** and a **secretary bird** were observed on farm Katdoornpan 362. **Vultures and eagles** were observed on farm Kranshoek 1089. Herons were observed along the route on farm Mooivlakte 571

Potential impact (e.g. threat of electrocution, collision, etc): Bird collisions at inland water pans where birds associated with these pans migrate to water and back to their habitats. The electrocution of guinea fowls as they sit on conductors. The electrocution of vultures and eagles as they sit on Eskom’s structures. The streaming of birds on Eskom conductors causes pollution of structures and current faults. Pouching of guineafowls and springbucks by contract workers. The disturbance of wild animals, cattle and livestock. Animals escaping from the property due to the damaging of fences and gates being left open by contractors.

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Comments/mitigating measures: Use bird friendly structures. Install bird flappers on the line where inland water pans are present close to the line. Pouching of any bird or animal should not take place. Workers should inform land owner when activities will commence so that landowners can relocate their animals. No form of fire should be started on any property. Animals and birds should not be disturbed in any way. Keep construction activities during normal working hours. Do not damage any farm fence or violate the landowner’s rules on the opening and closing of gates. Refrain from driving through grazing land of animals as far as possible. Keep the driving of vehicles close to the farm fences. Install bird flappers where the line is going to cross near or over inland water bodies. Make use of rapture protectors on the Eskom infrastructure, call the EWT toll free number: 0860 111 535 or Rudi Kruger 053 830 5771 for information on suppliers of rapture protectors.



Image 14: Springbucks on farm Whitbourne 730



Image 15: Cattle on farm Katdoornpan 367

6 Social environment

6.1 Restricted areas:	nature/game reserves	hiking trails	tourism routes	parks	recreational areas
residential-areas	green belts	sacred/holy grounds	OTHER Farm houses, Workers houses		

Brief description: Occupied farm houses and **farm workers houses** (See image 16) were observed along the route of the line on the farms where take-off lines are going to be rebuilt to transformer poles to supply electricity to **farm houses**(See image 17).

Potential impact (threat of encroachment, etc.): Noise, dust and land pollution. The construction activities might pose a safety hazard to occupants. Electrocutation due to low hanging conductors or conductors lying on the ground. The encroachment of safety clearances from houses.

Comments/ Mitigating measures: Keep safe clearances from houses and other structures that are on the farms. Barricade construction site and put signs of construction up in the vicinity. Inform landowners when construction are going to take place. Do not litter, remove waste and surplus materials from the landowners property after construction.

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Image 16: Farm workers house on farm Eben Haezer 1040



Image 17: Farm house on farm Leeuwberg 882

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6.2 Visual aesthetics: easily seen hidden **Partially**.....

Brief description: The line is partially seen because it is a rebuild of the line at most parts. The proposed route is mainly next to the road and farm tracks where the existing Telkom communication lines are standing.....

Potential impact: New electric infrastructure will be present at parts where no infrastructure was visible prior to the project.

Comments/ Mitigating measures: Make use of wooden structures as far as possible. Keep the line close to the roads.

6.3 Sensitive areas: historical sites archaeological monuments natural heritage sites
 graves landmarks ruins OTHER.....

Present condition: NONE OBSERVED.....

Potential impact: Possible impact on heritage resources: NONE

Comments/mitigating measures: NONE

7 Economic environment

7.1 Land use: crops orchards grazing crop spraying
 game farming forestry areas mining OTHER Grape
 garden.....

Brief description: Most of the grassland is being used for grazing land for cattle and livestock. There are land that is being cultivated for maize, sunflower, potatoes, unions and lucern crops observed along the route of the line for example on farms Boesmans put 152, Ebenhaezer 1040, Tevrede 1052, Katdoornpan 367 and Mooivlakte 571 (See image 18). A grape garden was also observed next to the road on farm Katdoornpan 367 (See image 19). Game farming with springbuck, blesbuck is also practiced in the area on farms Boesmansput 152, Ebenhaezer 1040, Hartebeesplaat 1142, Legkraal 65, Reddersfontein 410.

Potential impact: The loss of fertile topsoil for crops due to construction and line patrolling activities. Land pollution and the destruction of grazing land due to oil leakages from vehicles and equipment on site. Disturbance and Pouching of livestock and wild animals by the noise and farm workers. Acceleration of soil erosion due to human and vehicular movement in and close to the cultivated land. Positive impact is that farmers will have better electricity supply for their irrigation points.

Comments/ Mitigating measures: Minimise driving activities through cultivated land and drive at a moderate speed. When removing soil for pole holes, keep the top soil at a safe place, replace the soil in the same layers as when it was removed in order to keep the fertile top soil. Do not disturb or pouch livestock and wild animals. Inform landowners when construction is going to commence on their properties, so they can relocate their animals to a safe place. Ensure that vehicles and equipment is serviced regularly to avoid oil leakages on site. Do not plant poles within irrigation points. Use long conductor spans and higher structures over cultivated lands. Do not disturb the grape garden on farm Katdoornpan 367. Consult with the landowners regarding the opening and closing of gates on their properties. Minimise the removal of vegetation where animals are grazing.



Image 18: Cultivated land on farm Katdoornpan 367



Image 19: Grape garden on farm Katdoornpan 367

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7.1.1 Commercial: factories shops OTHER

Brief description: NONE OBSERVED

Potential impact: NONE.....

7.1.2 Infrastructure: roads railways communications power lines air fields
 pipelines sewage OTHER

Brief description: The N8 national road, R48 Secondary road, gravel roads and farm tracks were observed along the route of the proposed line. Existing Telkom communications infrastructure is also present next to the road where the proposed line is going to be constructed.

Potential impact: The encroachment of road clearances might take place due to the elevation of the N8 national road (See image 20). Road crossing permits obtained from the Department of Transport, roads and public works being outdated. Safety clearances of Telkom communication infrastructure might be encroached.

Comments/ Mitigation measures: Before constructing the line, verify the road clearances for powerline crossings on the newly constructed N8 national road at the point where the proposed line is going to cross the road. Obtain permission from Telkom to cross their communication infrastructure. Be alert for loose structures and hanging conductors. Remove old conductors and structures from the proposed route.



Image 20: N8 national road construction

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7.1.3 Impact

What impact will this project have on elements 4 to 7?

Physical

No impact (0) Medium impact (2) High impact (4)

Natural

No impact (0) Medium impact (2) High impact (4)

Social

No impact (0) Medium impact (2) High impact (4)

Overall impact

This section addresses the overall environmental impact of the project. The impacts as assessed in the above three spheres (physical, natural and social) need to be considered to determine the overall impact

0	2	4
No impact	Medium impact	High impact

If the overall impact is between 2 and 4, contact the Environmental Practitioner or specialist.

Alternatives

Have alternative routes been discussed with the relevant land owner/s or users?

Yes _____

No _____

Detailed study

Is an *environmental scoping* required in terms of regulation 544?

Yes _____

No _____

SAHRA

Should SAHRA be notified regarding the project?

Yes _____

No _____

Annex A

Environmental Management Plan

1 General conditions

- 1.1 The Eskom project manager or co-ordinator shall be responsible for ensuring that the land owners have been informed before any work is carried out on site. Contractors shall find out if the land owners have been informed before moving onto site.
- 1.2 No fences, gates or locks shall be damaged to obtain access onto a line route. Arrangements shall be made in advance to obtain permission for access.
- 1.3 Use of private roads shall be arranged in advance. Any damage to private roads shall be repaired at the contractor's expense and to the satisfaction of the land owner. This shall be the responsibility of the project manager or co-ordinator.
- 1.4 Gates shall be left as they are found, i.e. closed gates shall be kept closed and open gates shall be left open. Gates to adjacent properties or onto public roads shall be closed at all times. Any Eskom gates installed on the line route shall be kept closed and locked except while stringing is taking place. Open gates shall be guarded to prevent animals straying and unauthorized persons and vehicles entering into adjacent camps or properties.
- 1.5 Permission shall be obtained from land owners before any water is used.
- 1.6 No fires shall be lit on private property. If fires are lit on Eskom's property or in the construction camp, provision shall be made that no accidental fires are started. No fire wood shall be collected in the veld.
- 1.7 If activities that can cause a fire are carried out, fire extinguishers shall be available on site and in the construction camp.
- 1.8 No property may be accessed after normal working hours except with the permission of the land owner. Privacy shall be respected at all times.
- 1.9 Eskom, Eskom's contractors and their employees shall at all times be courteous towards land owners, tenants and the local community.
- 1.10 Eskom, Eskom's contractors and their employees shall not cause damage to property, crops or animals. Activities that may cause conflict with land owners, tenants, the local work force or the local community shall be avoided. Should conflict arise it shall be immediately reported to the Eskom project manager or co-coordinator.
- 1.11 Vehicles shall be driven at a moderate speed on private roads and stay within the statutory speed limit on public roads.
- 1.12 All movement of vehicles shall take place on the established Eskom servitude road or on private roads as agreed in advance. Keep to existing tracks. No movement shall take place through the veld. Special care shall be taken to prevent excess damage during wet weather.
- 1.13 If any vehicle should get stuck, the damage shall be repaired immediately so that no deep ruts remain.
- 1.14 Any damage to private property shall immediately be reported to Eskom and the owner. The damage shall be rectified immediately if possible and/or appropriate compensation shall be paid to the owner at the discretion of the project manager/co-ordinator in consultation with the property owner. A record of damages and rectifying action shall be kept. The land owner's satisfaction with the outcome of rectifying action shall be obtained in writing.

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1.15 A proper system of waste management shall be instituted in the construction camp. This entails that sufficient waste bins are available on site and in the construction camp. The waste shall be dumped at an approved waste disposal site. No containers, scrap metal, conductor etc. shall be left on site.

All scrap shall be removed and taken to an appropriate disposal site. No oil, diesel or other chemicals shall be spilled or discarded anywhere. If an accidental spill occurs, it shall be reported immediately and cleaned to the satisfaction of Eskom and the land owner. No waste shall be left in the veld or on the line route.

1.16 Washing and toilet facilities shall be provided on site and in the construction camp. The facilities shall comply with Eskom standards and shall have the approval of the land owner.

1.17 No human excrement shall be left in the veld. If no toilet facilities are available such waste shall be buried immediately.

1.18 Herbicides shall only be applied with Eskom’s permission and in accordance with the Eskom Policy on Herbicides ESKPBAAD4.

1.19 Camp and office sites shall be dismantled and removed after completion of the construction phase of the project. The site shall be rehabilitated to as close as possible to its original condition to the satisfaction of the land owner which shall be in writing.

1.20 All excavations shall be enclosed to prevent animals or people from accidentally falling into excavations.

1.21 No trees shall be cut or removed without prior permission from the landowner. Permits shall be obtained for the cutting and removal protected trees (protected trees shall be dealt with in 2, Special conditions).

2 Special conditions

(Specific issues identified during the scoping as needing attention i.e. erosion berms, bird flappers, protected trees. etc.).

2.1 Inform the landowners immediately after bush clearing activities because landowners want to remove the wood from tree debris themselves.

2.2 Do not damage the farm fences.

2.3 Inform landowners when construction is going to commence on their properties.

2.4 Contractors should ensure that all personnel and vehicles are clearly marked to ensure that they are easily identified as Eskom contractors

2.5 Mr J.M. Fraser requested for his gates on farms Garing (B) 391 and Izak’s hoop (B) 591 to be opened from 7:00-17:00

TYPICAL MITIGATION MEASURES

ENVIRONMENTAL CONCERNS	MITIGATION MEASURES
AGRICULTURE	
Loss of standing crop due to access road and tower work site.	<ul style="list-style-type: none"> - limit width of access and size of tower site. - avoidance of crop areas. - monetary compensation for crop loss. - time construction to avoid growing season.
Soil Compaction	<ul style="list-style-type: none"> - scheduling activities to times of the year when soils are least susceptible to compaction. - stop activities when ground conditions are poor. - use of equipment with low bearing

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	<ul style="list-style-type: none"> - capacity. - chisel ploughing.
Construction of new lines	<ul style="list-style-type: none"> - locate access roads along existing traffic routs.
Topsoil – subsoil mixing/soil rutting	<ul style="list-style-type: none"> - scheduling activities. - stop activity when ground conditions are poor. - use of equipment with low bearing capacity. - use of gravel roads. - addition of manures to offset fertility loss. - compensation for reduced soil productivity. - removal of spoil and/or bentonite from foundation operations. - Segregation of topsoil and subsoil.
Disturbance to farm operations	<ul style="list-style-type: none"> - maintain contact with landowner/tenant regarding preferences.
Loss of livestock	<ul style="list-style-type: none"> - employ noise control measures near sensitive livestock. - Construction of farm gates. - Securing farm gates. - Clean-up construction materials which could be ingested. - Compensation for lost, injured livestock.
SOCIAL IMPACTS	
Noise and Vibration	<ul style="list-style-type: none"> - limit this type of work to daylight hours. - observe protocol or applicable municipal by-laws. - use of appropriate methods where available.
Mud and Dust	<ul style="list-style-type: none"> - wetting down dry soils. - chemical control of dust. - cleaning roads to remove mud. - temporary planting of grasses.
Aesthetics	<ul style="list-style-type: none"> - screen with natural or planted vegetation restoration. - avoid linear access down the right-of-way. - addition of topsoil to gravel access roads. - hoarding construction sites. - installation of landscaping in advance of site completion.
Inconvenience	<ul style="list-style-type: none"> - select route and method of installation to suit landowners' conditions. - select timing of activity.
Heritage resources	<ul style="list-style-type: none"> - avoidance/isolation. - design measures to make facility less obtrusive. - screening. - alternate methods of equipment. - protection by use of enclosures, barrier fencing, covering. - salvage in conjunction with SAHRA. - relocation in conjunction with SAHRA.
Tourism and recreation resources	<ul style="list-style-type: none"> - design measures to make facility less

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	<ul style="list-style-type: none"> - obtrusive or disruptive. - screening and restoration. - minimise noise and dust. - safety precautions to protect the public. - scheduling to avoid peak use periods.
WATER QUALITY	
Sedimentation of streams due to erosion from the right-of way.	<ul style="list-style-type: none"> - minimise use of slopes adjacent to streams during soils testing, construction and maintenance. - maintain a cover crop. - retain buffers.
Stream bank erosion.	<ul style="list-style-type: none"> - mechanical erosion control. - retain shrubby stream bank vegetation and selectively cut or prune trees during line clearing/maintenance. - selective spraying of herbicides. - Mechanical erosion control.
Impedance of natural flow streams/others surface waters.	<ul style="list-style-type: none"> - use and maintenance of appropriate stream crossing device.
Ponding or channelization of surface waters due to rutting.	<ul style="list-style-type: none"> - timing activities to stable ground conditions. - use of gravel roads.
Contamination of surface or ground waters through spills or leaks of toxic substances.	<ul style="list-style-type: none"> - spill control material and procedures readily available. - site selection where possible.
Soil compaction/topsoil-subsoil mixing.	<ul style="list-style-type: none"> - avoidance of rutting by vehicles where possible. - construction timing. - use of gravel roads. - use of vehicles with low bearing pressures. - stop activities when ground conditions are poor.
Wind/water erosion.	<ul style="list-style-type: none"> - avoidance of areas with high erosion potential. - timing activities to the most stable ground conditions. - slope stabilisation. - mechanical erosion control. - vegetation erosion control. - recompaction of trenches. - avoid trenching parallel to the fall of a slope.
Contamination by petrochemicals.	<ul style="list-style-type: none"> - spill control material and procedures made readily available. - restoration methods investigated.