PROPOSED CONSTRUCTION OF THE KGALABATSANE SUBSTATION) AND ITS ASSOCIATED 132KV OVERHEAD POWER LINE (NORTH WEST PROVINCE

FINAL BASIC ASSESSMENT REPORT

Second Amendment January 2016
First Amendment September 2015

DEA Reference: 14/12/16/3/3/1/1320

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Note to assessing officer: the original report has been amended upon recommendation of DEA to discuss only the Kgalabatsane SS and line, and exclude all references to the Wesglass SS and line.

Date	**January 2016** **First Submission July 2015**
Project	Proposed construction of the Kgalabatsane Substation and associated 132kV Overhead Power Line (North West Provinces)
Document Title	FINAL Basic Assessment Report
Author	Marinda le Roux
Document Revision	**FINAL** (Amended)
Signature	

ABREVIATIONS

BAR	Basic Assessment Report
DEA	Department of Environmental Affairs
DoE	Department of Energy
EAP	Environmental Assessment Practitioner
EMPr	Environmental Management Programme
EIA	Environmental Impact Assessment
ERA	Electricity Regulation Act (No. 4 of 2006)
GN	Government Notice
Ha	Hectares
HIA	Heritage Impact Assessment
I&AP's	Interested and Affected Parties
IPP	Independent Power Producer
MW	Megawatts
NEMA	National Environmental Management Act (No. 107 of 1998) (as amended)
NHRA	National Heritage Resources Act (No. 25 of 1999)
NWA	National Water Act (No 36 of 1998)
SAHRA	South African Heritage Resources Agency
SDF	Spatial Development Framework

NOTE: The application for this project was submitted before 8 December 2014, thus the BAR has been compiled in relation to the 2010 regulations and amendments before the 2014 Regulations came into effect.

environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

(For official use only)

File Reference Number:	
Application Number:	
Date Received:	

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2010, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

Kindly note that:

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the **EIA Regulations, 2010** and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. This report format is current as of **1 August 2014**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
6. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.

14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
15. Shape files (.shp) for maps must be included in the electronic copy of the report submitted to the competent authority.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section? **YES ✓** | NO

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

1. PROJECT DESCRIPTION

a) Describe the project associated with the listed activities applied for

Proposed construction of the Kgalabatsane Substation & 132kV Overhead Power Line

The proposed project consists of a substation and its associated loop-in, loop-out power lines. The loop-in, loop-out power line will be connected to a previously proposed power line which connects the existing Garankuwa- and the proposed Dipompong Substation. The Garankuwa-Dipompong power line is not constructed yet and is not part of this study.

The preferred routing options for Kgabalatsane were identified during extensive site and routing investigations undertaken by Eskom representatives. Topography, hydrology, land ownership and servitude negotiation, line maintenance, line constructability, access, economic, social and environmental aspects were considered during the viability assessment of the route. Based on this assessment the preferred options were identified as the most viable routing option for Kgabalatsane.

Kgabalatsane SS and Power Line

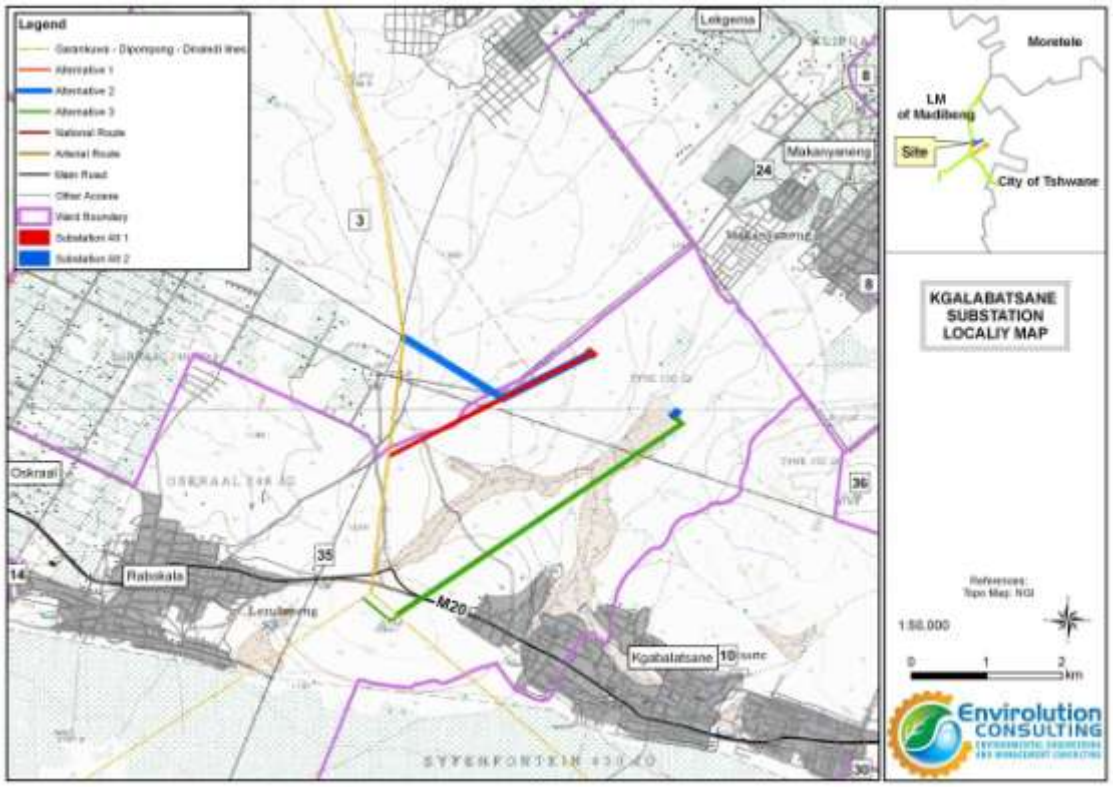


Figure 1 – Locality map Kgabalatsane

This section of the application (KB) relates to the area to the north of Kgabalatsane township in the North West Province. The Garankuwa Main 132/33kV and 132/11kV lines form the main primary feed for the substations in the Garankuwa and Mabopane Area. The applicant is Eskom Holding SOC Limited.

The 33kV networks in the area are overloading and there is a need to establish a new substation in Kgalabatsane to deload the 33kV and reticulation feeders in the area. The proposed substation at Kgalabatsane will contribute to the electrification of the Kgabalatsane area. This substation is situated in the middle of the 3 townships that it will be feeding, namely Rabokala/Lerulaneng, Kgabalatsane and Makanyaneng. The proposed Kgalabatsane substation will be located approximately 16km south from the future Dipompong substation and 4km NorthWest of the proposed Wesglas substation (site to be confirmed and EA to be applied for). A servitude of 81m wide is proposed for the 132kV Overhead Power Lines from the Kgabalatsane substation towards the south-west where it will connect to the line that links Dipompong (future substation) to the Dinaledi substation (existing). This servitude will accommodate three 132kV lines, namely:

- the Wesglass-Kgabalatsane line
- the Dinaledi-Kgabalatsane line
- the Kgabalatsani- Dipompong line

The Kgabalatsane segment consists of **three alternative routes** for the loop-in and loop-out power lines and two alternative sites for the Kgabalatsane Substation. According to the available information two loop-in and one loop-out power lines are considered which makes it a total of three lines in parallel. **The preferred (SS Alternative 1, red block on map above Figure 1) substation** site is located a couple of hundred meters south of the road that joins Klipgat/Makanyaneng and Lerulaleng/Lethabile (client's preferred site, indicated in red on map below). The associated two alternative alignments (**Alternative 2 – blue line**, and **Alternative 3 – green line**) are similar although they connect at different locations to the Garankuwa-Dipompong power line. The alternative substation site (**SS Alternative 2 – blue on map above Figure 1**) is further from the Klipgat/Makanyaneng and Lerulaleng/Lethabile road. It is located approximately 1.5 km south east from the road near a small intermittent stream. The loop-in and loop-out power lines will follow a south western route, over the M20 road towards a slightly elevated point in the landscape where it will join with the Dinaledi-Dipompong power line.

Kgabalatsane Preferred option (Alternative 1 SS and Alternative 1 power line)
The preferred Kgalabatsane substation position is located approximately in the middle of the north-western boundary of the Farm Tyne 250-JQ. This site will have a short access road from the existing gravel road that link the villages of Makanyaneng and Rabokala. Both the preferred (SS Alternative 1, red SS) and Alternative 1 overhead power line (red line on map above Figure 1) for Kgabalatsane would branch off from the Ga-Rankuwa-Dipompong-Dinaledi line that runs south to north through this area. This preferred route would branch off from the existing line in a north-easterly direction from approximately the central eastern boundary of the Oskraal village to the substation position.

Length of Kgabalatsane Alternative 1 (the red line) – 2761.06m
Length of Kgabalatsane Alternative 2 (the blue line) – 2644.24m
Length of Kgabalatsane Alternative 3 (the green line) – 4960.91m

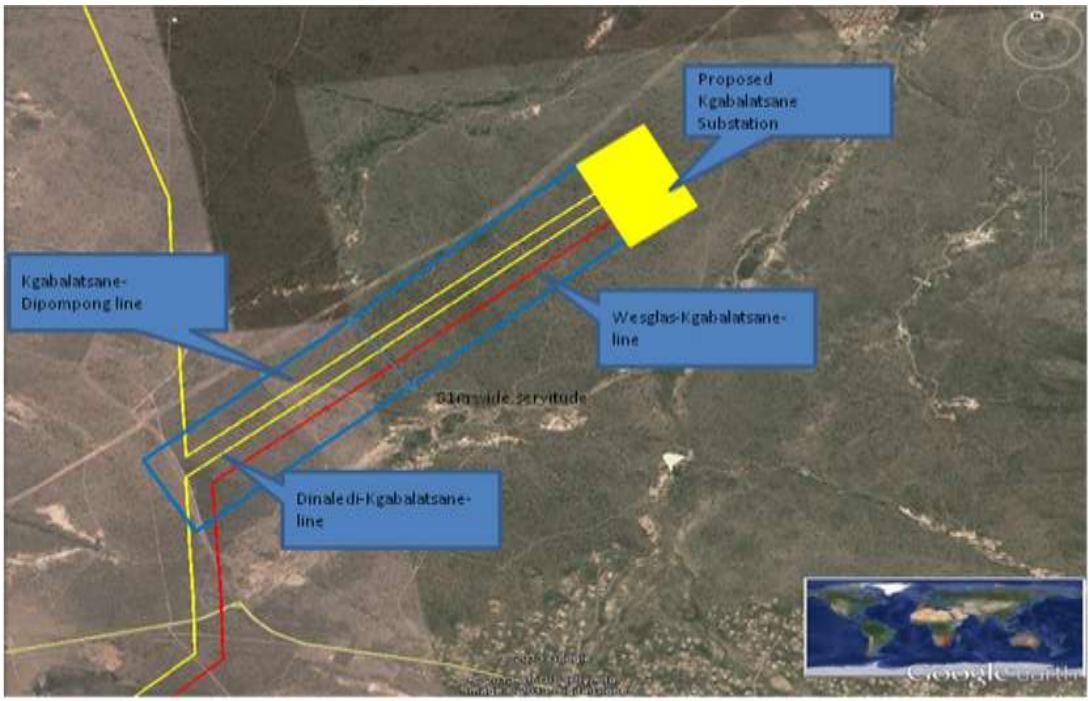


Figure 1.1 – Alternative 1 (preferred option) from Alternative 1 Substation

Kgabalatsane Alternative 2 SS and Alternative 2 power line

The Alternative 2 route would run from the existing line in a south-easterly direction from the south-eastern corner of the village of Oskraal to just across the farm boundary of Tyne and then turn north-east to the substation position. The alternative substation position is located approximately in the centre of the Farm Tyne 250-JQ just east of the non-perennial stream. The footprint for the substation is within the 32m area from the stream, and a Water Use Licence Application (WULA) will be lodged at DWS.

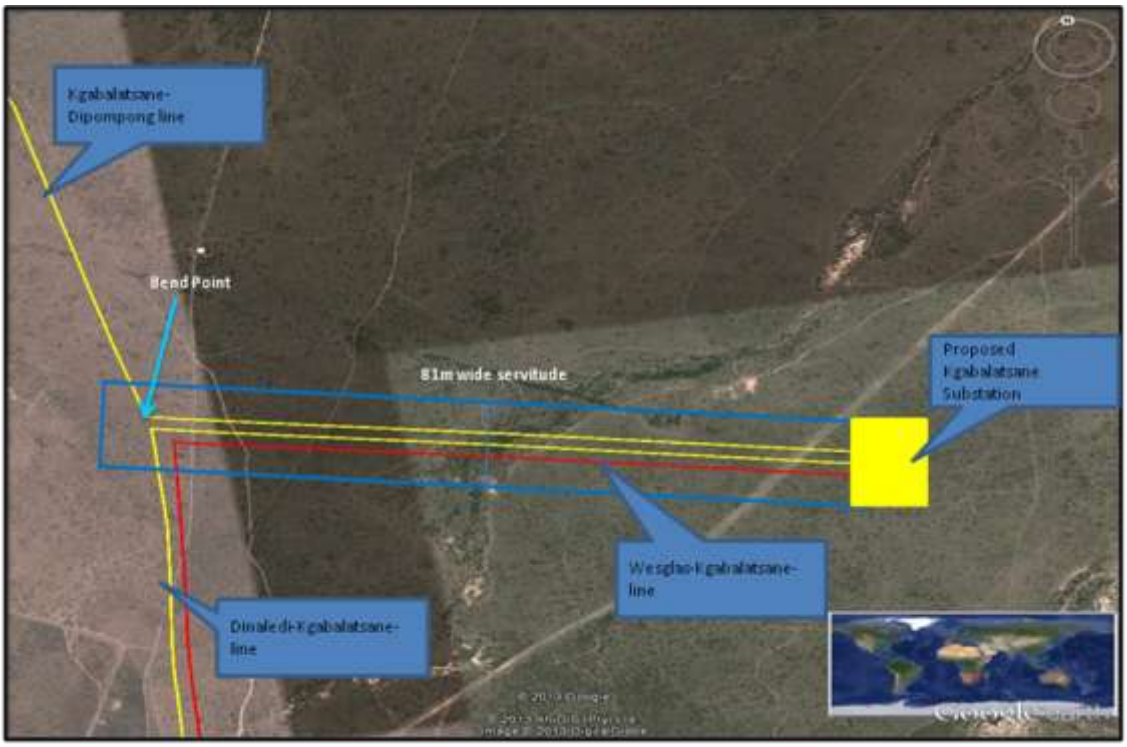


Figure 1.2 – Alternative 2 line (Alternative 2 substation)

Kgabalatsane Alternative 3 power line (also from Alternative 2 SS)

The Alternative 3 power line route would branch off from the existing line just before the junction from Dinaledi and Ga-Rankuwa. It will run south-east for a very short distance before turning north-east over the M20 provincial road and to the west of the village of Kgalabatsane to the substation (Alternative 2) position.

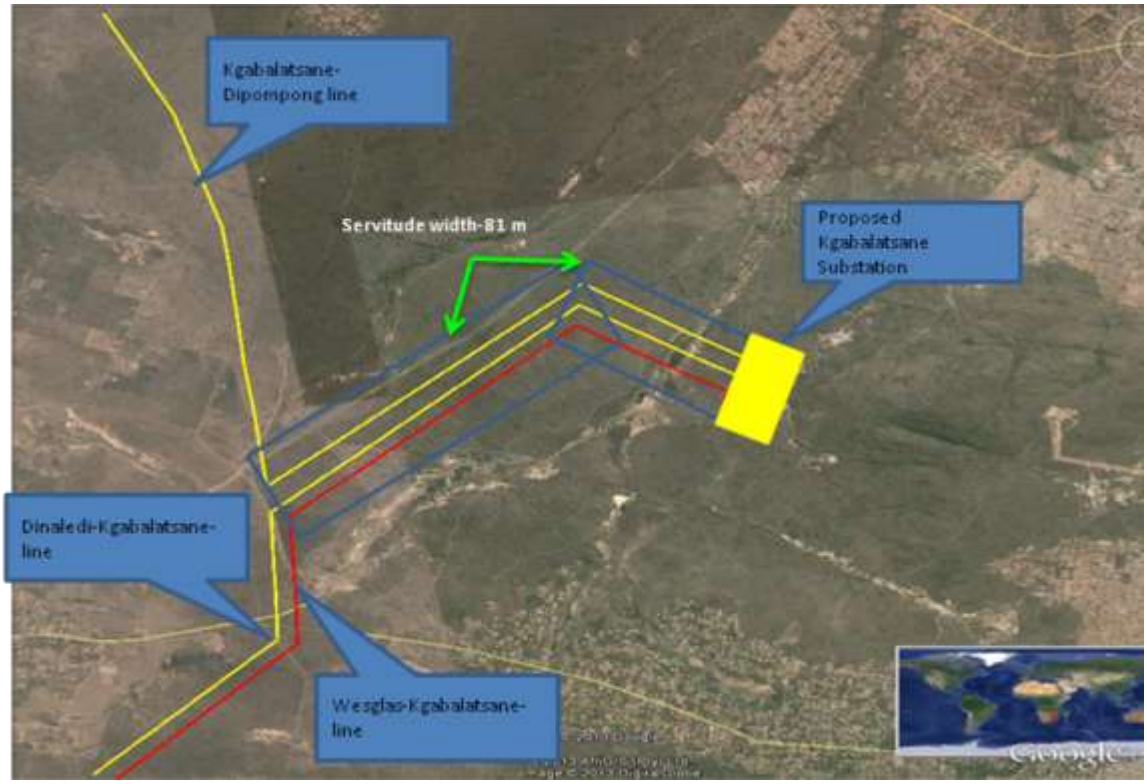


Figure 1.3 – Alternative 3 line (Alternative 2 Substation)

A servitude of 31m wide is proposed for the lines (132kV Overhead Power Line) from the proposed Ga-Rankuwa substation site towards the north-west where it will connect to the line that links Dipompong (future substation) to the Dinaledi substation (existing).

Note: The Ga-Rankuwa-Dipompong line has a servitude acquired date of 2017, and **a separate Basic Assessment has been undertaken** to apply for authorisation, which forms part of the Winterveld Electrification Strengthening Strategic Servitudes (commissioning date: 2019).

The proposed power line for the Ga-Rankuwa-Dipompong line will connect the GaRankuwa substation and the Dinaledi substation in the south with the proposed new Dipompong substation and Tswaing substation in the northern extent of the proposed power lines. The route is situated within the City of Tshwane Metropolitan Municipality (Gauteng Province) as well as within the Madibeng Local Municipality (North West Province).

The Geographical Network Upgrade (Planning) for the region is shown below:

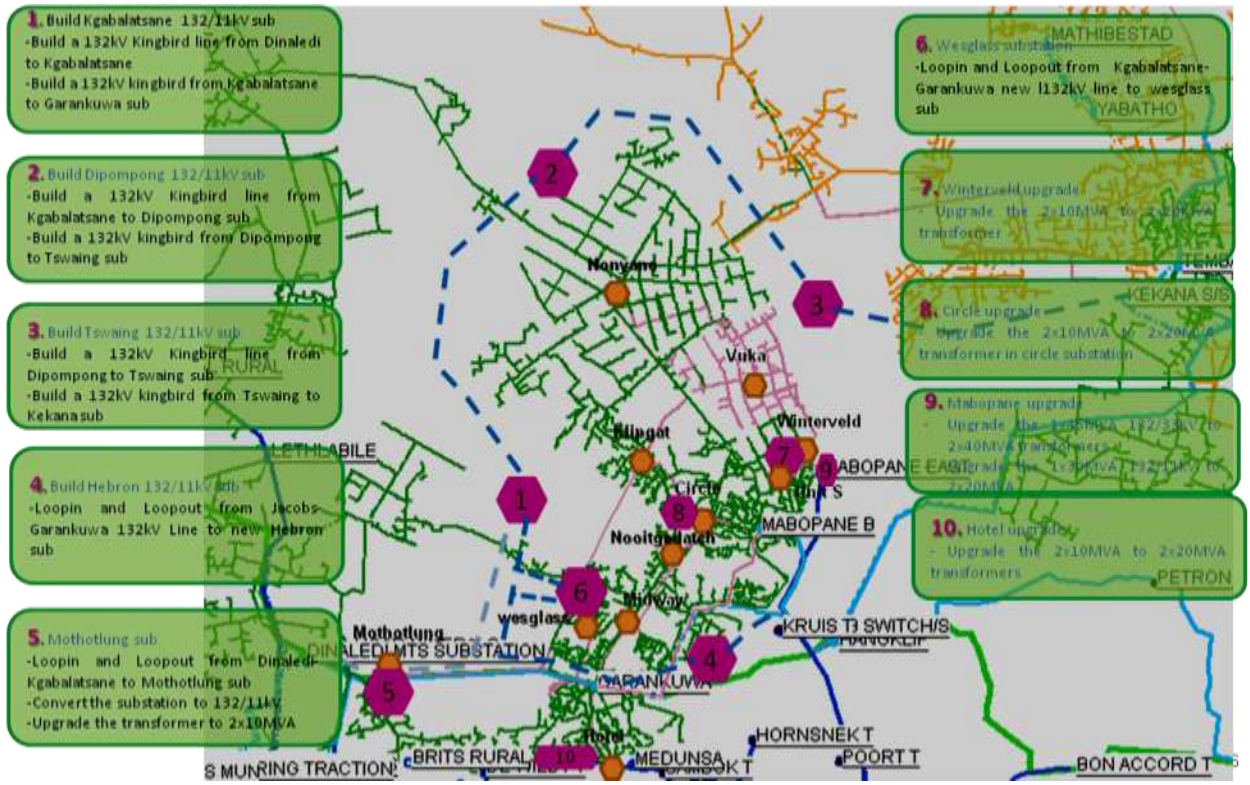


Figure 3 – Geographical Network Upgrade Planning for the area

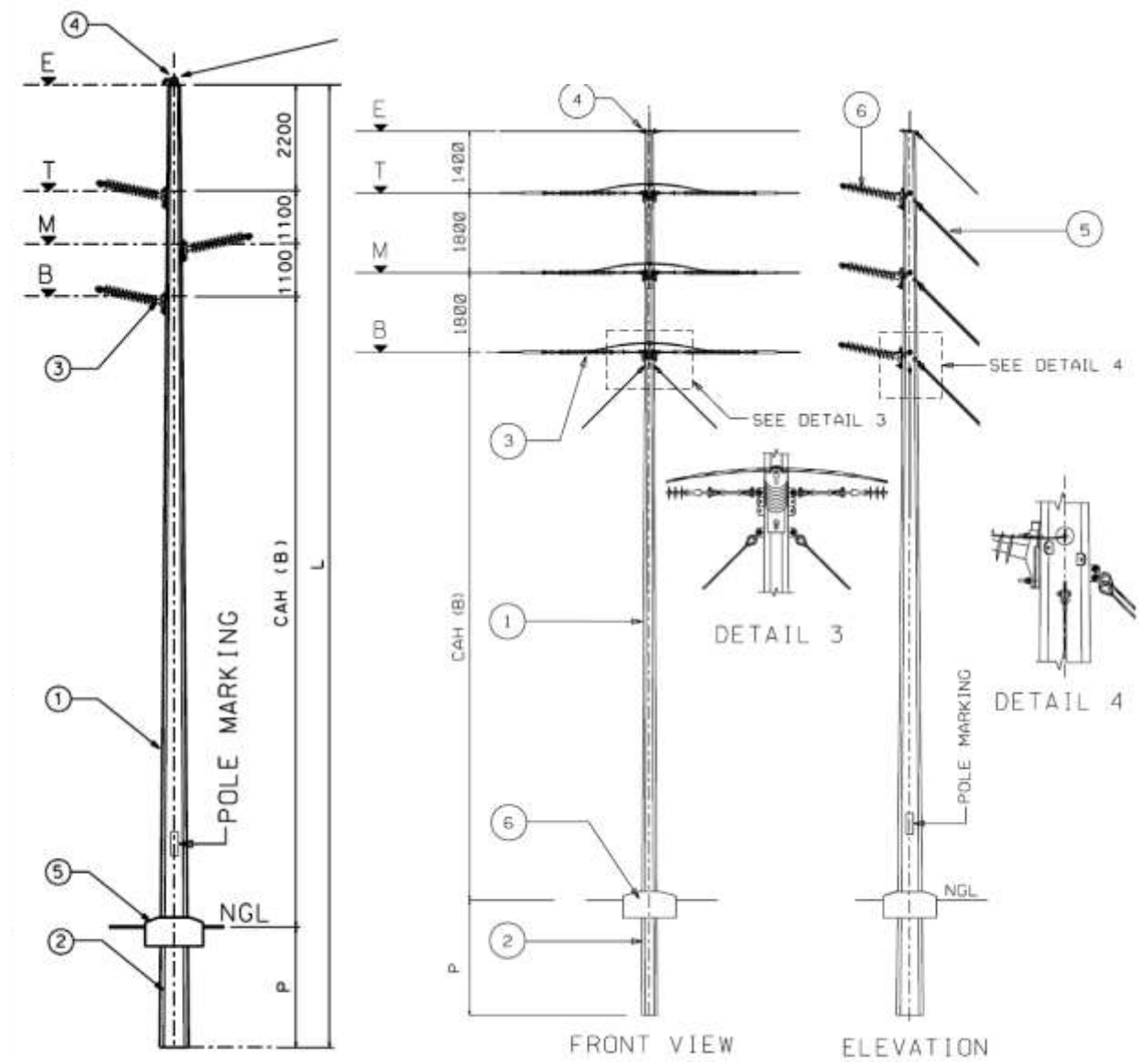
The power lines servitude will be cleared of all wooded species and any other protruding alien vegetation so as to reduce fire risks, to ensure access for maintenance purposes and to prevent shortages with vegetation. An 8-ton crane truck is generally used to erect the structures. A **foundation of 1.5 x 1.5 x 2.5 m** will be required for each supporting and load bearing structure. Although the proposed power lines follow existing servitudes and roads for parts of the line, access roads for minor vehicles may be created during the construction phase and during periodic maintenance.

132 kV Structures

The size of the foundation footprint depends on the type of structure to be used and ranges from 0,36 m3 to 2,35 m3, with the larger footprint associated with the angle strain structures (where required) . The average span between two towers would be approximately 200 m, but can vary between 250 m and 375 m depending on the ground profile and the terrain to be spanned. Guyed suspension structures are typically used along straight sections of power lines, while the self-supporting angle strain structures are used where there is a bend in the power line alignment.

The images below show the Stayed Angle Strain Structures that are proposed for this project:

DESIGN REQUIREMENTS			SCHEDULE FOR CONDUCTOR ATTACHMENT HEIGHTS			
POLE LENGTH L	TIP LOAD (kN)	PLANTING DEPTH P	C A H (m AGL)			
			E	T	M	B
18	23	2.0	16.0	14.6	12.8	11.0
19	23	2.0	17.0	15.6	13.8	12.0
20	23	2.0	18.0	16.6	14.8	13.0
21	23	2.0	19.0	17.6	15.8	14.0
22	23	2.0	20.0	18.6	16.8	15.0
23	23	2.0	21.0	19.6	17.8	16.0
24	23	2.0	22.0	20.6	18.8	17.0



Servitude Requirements and Clearances. The servitude area for a 132 kV distribution line is 31 m wide (15.5 m on either side of the centre line of the power line). The minimum vertical clearance to buildings, poles and structures not forming part of the power line must be 3.8 m, while the minimum vertical clearance between the conductors and the ground is 6.7 m. The minimum distance of a 132 kV distribution line running parallel to proclaimed public roads is 95 m from the centreline of the distribution line servitude to the centreline of the road servitude. The minimum distance between any part of a tree or shrub and any bare phase conductor of a 132 kV distribution line must be 3.8 m to allow for the possible lateral movement of this vegetation that could be a potential hazard for distribution lines that are operational and energised. The Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) provides for statutory clearances.

The table below summarizes some of the key clearances relevant to the proposed 132 kV power line.

Clearance specifications (Eskom, 2007).

Clearances	Minimum Clearance Distance (m)
Ground clearance	6.7
Building structures not part of power line	3.8
Above roads in townships, proclaimed roads	7.5
Telkom telephone lines	2.0
Spoornet tracks	10.9

Should the preferred distribution line corridor receive environmental authorization from DEA, and following on from successful negotiations with landowners, the final delineation of the centreline for the distribution line and co-ordinates of each bend in the line will be determined.

Optimal tower sizes and positions will be identified and verified through comprehensive ground survey of the preferred route and these positions will be reflected, and appropriate management actions incorporated into the continuously and periodically updated Environmental Management Programme (EMP). Trees and large shrubs that will cause clearance issues will be trimmed or cleared, while a narrow footpath for workers will be cleared down the centre of the distribution line servitude for stringing purposes. If any tree or shrub in other areas will interfere with the operation and/or reliability of the distribution line it will be trimmed or completely cleared. In areas where distribution lines cross existing pastures or agricultural lands in use the footprint of the structures will be minimised and full scale clearing of the servitude avoided to allow continued use of the arable land, unless otherwise negotiated with the affected farmer/s. The clearing of vegetation will take place, with the aid of a surveyor, along approved profiles and in accordance with the approved EMP and Eskom's minimum standards to be used for vegetation clearing for the construction of the proposed new 132 kV distribution line.

Access. Access is required during both the construction and operation/maintenance phases of lines life cycle. Where possible, existing access roads and tracks will be used to gain access to construction sites and the servitude. Where no access roads/tracks exist, the access points and roads will be negotiated with the relevant landowner, and are to be established during the construction phase. Access roads will enable the transportation of construction material as well as construction teams to the site and facilitate maintenance activities once the power line has been constructed.

Foundations. The type of terrain encountered, as well as the underlying geotechnical conditions determines the choice of foundation. The actual size and type of foundation to be installed will depend on the soil bearing capacity (actual sub-soil conditions). Strain structures require more extensive foundations for support than in-line suspension structures, which contribute to the cost of the construction of the line. Foundations will be mechanically excavated where access to the site is readily available. The same applies to the pouring of concrete required for the setting of the foundations. In areas where access to the structure position prohibits the use of concrete mixing trucks, uphill pumping or gravity feeding of concrete up to distances of 200 m will be implemented. Prior to erecting the structures and infilling of the foundations, the excavated foundations will be covered/fenced-off in order to safeguard unsuspecting animals and people from injury. All foundations are back-filled, stabilised through compaction, and capped with concrete at ground level.

Insulators. Composite insulators have a glass-fibre core with silicon sheds for insulation and are used to connect the conductors to the towers. Glass and porcelain have been used to connect the conductors for many years, and is the most common. These products are, however, heavy and susceptible to breakage by vandals, as well as contamination by pollution. Composite insulators are lightweight and resistant to both vandalism and pollution. Composite (Long rod type) insulators with silicone based weather shed material will be used.

Stringing of Conductors. A pilot cable is used to string the conductors between towers. This can be undertaken mechanically or by hand. The line is strung in sections (from bend to bend). Cable drums are placed at 5 km intervals (depending on the length of the conductor) during this stringing process. In order to minimise any potential negative impacts on the surrounding area, these cable drums should be placed within the servitude.

Ongoing Maintenance. During the life span of the power lines, which is approximately 25 years, ongoing maintenance is required to be performed from time to time. Eskom maintenance staff and contractors employed by Eskom will undertake the maintenance works as required.

Construction Process for distribution lines and substations.

Power lines are constructed in the following simplified sequence:
Step 1: Determination of technically feasible distribution line alternatives;
Step 2: EIA input into route selection and obtaining of relevant environmental permits;
Step 3: Negotiation of final route with affected landowners;
Step 4: Survey of the route;
Step 5: Selection of best-suited structures and foundations;
Step 6: Final design of distribution line and placement of towers;
Step 7: Issuing of tenders and award of contract to construction companies;
Step 8: Vegetation clearance and construction of access roads (where required);
Step 9: Pegging of structures;
Step 10: Construction of foundations;
Step 11: Assembly and erection of structures;
Step 12: Stringing of conductors;
Step 13: Rehabilitation of disturbed area and protection of erosion sensitive areas;
Step 14: Testing and commissioning;
Step 15: Continued maintenance.

A new substation

Two alternative locations have been proposed for a new substation at Kgalabatsane. The substation will cover an area of 100mx150m, to be equipped with 2x20MVA transformers. The 132kV incoming line will enter the proposed new substation at the approved safety height and will terminate into a Bus Coupler. Isolators are located in the Bus section. The Main Bus is connected to the Transfer Bus from where the outgoing lines will flow. Other infrastructure at the substation will include:

- Power Generator
- Lighting
- Surge Arrester
- Fencing and entrance gate
- Paving/surfacing (usually gravel)
- Drainage
- Foundations
- A telecommunication mast
- Signage

An Air Insulated Substation (AIS) is proposed which uses air to insulate the different components of the substation from each other as well as for grounding the charge.

Other components include:

- The lightning or Surge Arrester will assist to dissipate any excess or direct it to the ground.
- Air Break Switches are used to isolate equipment or a circuit within the substation allowing the various equipment or lines of the substation to be maintained without the risk of electrocution.

- Circuit breakers (automatic electrical devices) will protect the electrical circuit should any overload be caused on the line. For distribution substation use, vacuum technology is commonly used for extinguishing the arc caused by an overload inside a vacuum bottle. Other types of substation circuit breakers use oil or gas technology to insulate its components and help interrupt a fault.
- A step-down transformer will be provided to convert high-voltage power into a lower voltage that can be transmitted down distribution lines until it is further converted by smaller transformers to usable voltage.
- A voltage regulator will be installed to maintain the proper voltage and will ensure that the correct electrical output travels across the distribution lines to the consumer.
- The electricity moving through the transformer is sent to the high voltage bus, a junction of many different lines that disburse power in many directions.
- Metal-clad switchgear will be installed as the control center for the distribution lines that will exit from the substation. This is where electricity can be distributed to certain destinations with and protected with the aid of the cut-out switches, allowing lines to be isolated for required maintenance. The term metal-clad describes the housing which is metal enclosed to protect the sensitive equipment from the outside elements.

Any and all of these parts in an AIS environment are prone to environmental problems. Continued monitoring and maintenance are an absolute must to deliver reliable energy to consumers in a safe manner.

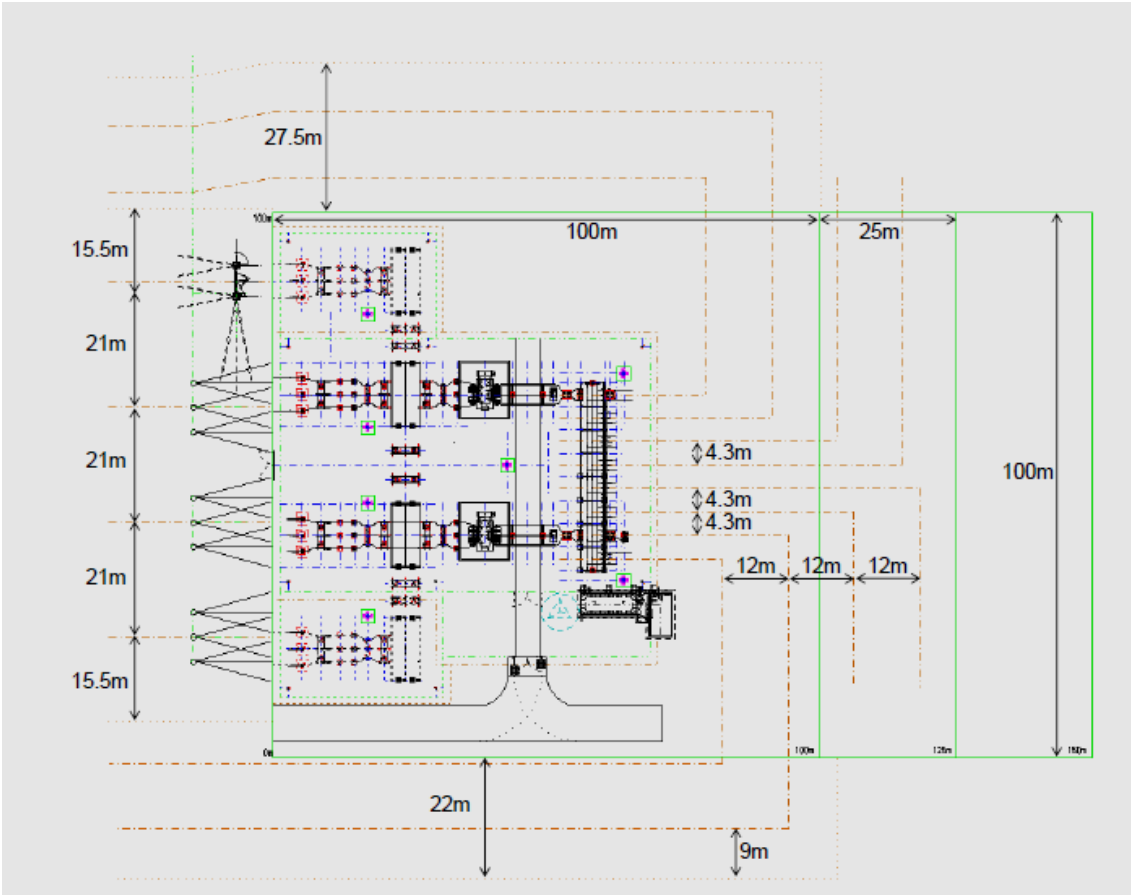
Corner coordinates of the substations:

Kgalabatsane Substation (Northern – Alt 1 Preferred)
27°57'5.109"E 25°29'38.759"S
27°57'2.632"E 25°29'40.825"S
27°57'1.367"E 25°29'35.651"S
27°56'59.007"E 25°29'37.579"S

Kgalabatsane Substation (Southern - Alt 2)
27°57'38.686"E 25°30'1.619"S
27°57'41.264"E 25°30'3.787"S
27°57'37.719"E 25°30'7.391"S
27°57'35.111"E 25°30'5.252"S

Construction of 132kV Substation

Layout of typical substation:



Telecommunications Mast. A communications mast may be required at the proposed substation sites. The mast is required to receive communication from surrounding towers. Full functioning of the substation will be reliant on these telecommunications masts, as its exclusion may result in the limited electrification of the surrounding

areas.

Job opportunities. Although the number of staff employed (skilled and unskilled) depends on the contractor, teams are generally made up according to the following table. Unskilled labour is usually trained by the contractors and is usually sourced from local communities.

The substation will be **constructed in the following simplified sequence**:

Step 1: Survey of the site;
Step 2: EIA and site-specific EMPr;
Step 3: Design of substation;
Step 4: Issuing of tenders and award of contract;
Step 5: Establishment of construction camp, vegetation clearance and construction of access roads (where required);
Step 6: Construction of terrace and foundations;
Step 7: Assembly and erection of equipment;
Step 8: Connection of conductors to equipment;
Step 9: Rehabilitation of any disturbed areas and protection of erosion sensitive areas;
Step 10: Testing and commissioning;
Step 11: Continued maintenance.

Likely Staffing Structure for the Construction of the Proposed Works

OPERATION	SKILLED	UNSKILLED
Bush Clearing	20%	80%
Gate installation	20%	80%
Excavations	80%	20%
Stay installation	80%	20%
Tower installation	50%	50%
Stringing	80%	20%
Excavation	20%	80%
Steel erection	50%	50%
Electrical Work	90%	10%

USE OF SERVICES AND RESOURCES

Storm water. Storm water will be managed in line with the Eskom Guidelines for Erosion Control and Vegetation Management, and the EMPr, which will be compiled for the proposed works.

Solid waste disposal.
Eskom has a strong commitment to waste minimisation and recycling. All solid waste will be collected at a central location at each construction site, and will be disposed at the registered waste site or stored temporarily until removal for recycling or disposal at an appropriately permitted landfill site in the vicinity of the construction site.

Electricity. Diesel generators will be utilized for the provision of electricity, where required.

Establishment of Construction Camps
The establishment of construction camps will be done in accordance to the stipulations of the final Environmental Management Plan and negotiations with the affected landowners.

Water
Water will be required for potable use and in the construction of the foundations for the towers. The water will be sourced from approved abstraction points at locations closest to the area of construction.

Sewerage
No sewage flow is anticipated during the construction or operational phase of the project. Chemical toilets will be made available for use by project staff, which will be serviced periodically by the supplier.

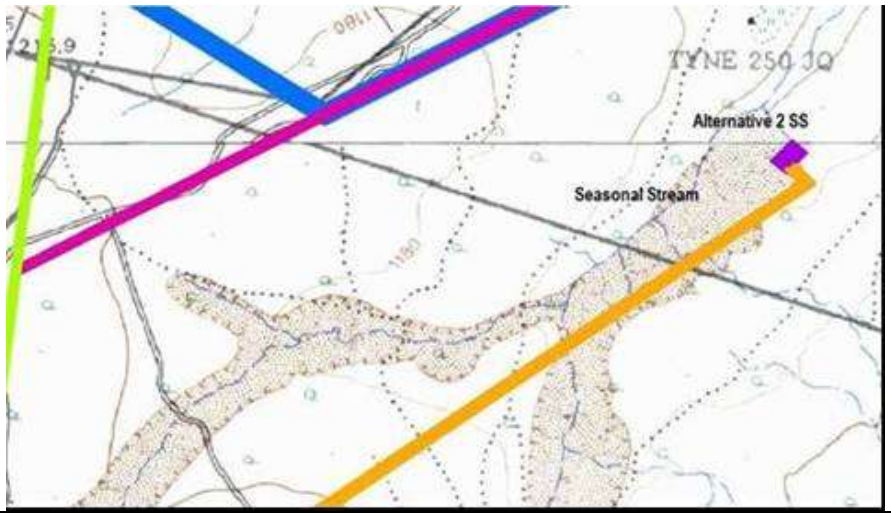
Roads
Existing roads will be utilised as far as possible during construction and operation. The use of roads on landowner property is subject to the provisions of an EMP that will be prepared for the project, with individual landowner specifications being determined during discussions with landowners during the servitude negotiation process.
Water. Water will be required for potable use and in the construction of the foundations for the towers. The water will be sourced from approved water use points at locations closest to the area of construction.

Electricity
Diesel generators will be utilised for the provision of electricity where electricity connection is not readily available.

Construction Process
The construction period will depend on the season and environmental conditions in which construction is undertaken. It is estimated that the construction will be completed within 9-12 months.

b) Provide a detailed description of the listed activities associated with the project as applied for

Listed activity as described in GN R.544, 545 and 546	Description of project activity
GN R 544 2010* (Listing Notice 1) **Activity 10** **(i)** The construction of facilities	The proposed facilities and infrastructure for the **distribution of electricity** will have *a capacity of 132 kilovolts,* thus this activity is listed and a Basic Assessment is required. The operation and construction servitudes will be 31m.

or infrastructure for the transmission and **distribution of electricity – *outside urban areas*** *or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;*	A new substation is proposed at Kgalabatsane to deload the 33kV and reticulation feeders in the area. These substations and the proposed new line are situated in a rural area (situated outside what is known as an urban complex) near the rural towns of Ga-Rankuwa, Rabokala/Lerulaneng, Kgabalatsane and Makanyaneng. The size of the foundation footprint depends on the type of structure to be used and ranges from 0,36 m3 to 2,35 m3, with the larger footprint associated with the angle strain structures (where required) . Single circuit steel mono-pole structures will require a foundation of 1.5 x 1.5 x 2.5 m will be required for each supporting and load bearing structure. The average span between two towers would be approximately 200 m, but can vary between 250 m and 375 m depending on the ground profile and the terrain to be spanned. Guyed suspension structures are typically used along straight sections of power lines, while the self-supporting angle strain structures are used where there is a bend in the power line alignment. Where Steel Lattice Structures are used, the footprint will be between 36m2 and 64m2 in size. The foundations will be installed to a depth of between 2m and 4m; and the height of the lattice structures will range between 18m and 30m. Lattice structures will allow span lengths of up to 500m depending on terrain and if the topography allows it. The operation and construction servitudes will be 31.0m. Variations and choice of tower structure design are due to a number of factors including the structure, the terrain, ground clearance requirements, topology and geology,etc.
GN R 544 2010 (Listing Notice 1) **Activity 11** The construction of **(xi)** infrastructure or structures covering 50 square metres or more **(a)** Where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.	Electrical infrastructure for the Alternative 2 Kgabalatsane substation (not preferred) will cover 150mx150m (thus more than 50 square metres) and will be positioned within 32 meters of a **seasonal stream**. The line Alternative 3 from this substation crosses the seasonal stream. This line alternative 3 is however not preferred. 

GN R 544 2010 **Activity 18: of listing notice 1 of 2010** The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal of soil, sand, shells, shell grit, pebbles or rock from **(i)** a water course	More than 5 cubic meters of material will be removed from the watercourse for the construction of the foundations for the tower structures, and for the substation (Alternative 2). For the Alternative 2 line and Alternative 2 substation, it will be required to remove more than 5 cubic meters of material will from the seasonal watercourse. Material will also be required to fill up the erosion dongas and level the ground where required. This alternative 2 substation is not preferred. This activity is not relevant to Alternative 1 Substation site (preferred).

2. FEASIBLE AND REASONABLE ALTERNATIVES

"alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by Regulation 22(2)(h) of GN R.543. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the, competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.
The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

a) Site alternatives

Alternative 1 (preferred alternative) Substation		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 1 (preferred alternative) This substation is preferred because it is located closest to the existing Garankuwa-Dipompong-Dinaledi line that the lines will connect to. The shorter line (alternative 1 and Alternative 2 lines) will be less expensive and have a limited impact on the environment due to its smaller footprint. The most important aspect however, is due to the	25° 29' 38" S	27° 57' 2" E

location of the Alternative 2 close to a water course on Tyne 250JQ and in the buffer zone of a seasonal wetland area. Corner coordinates - Kgalabatsane Substation (Northern - Preferred) 27°57'5.109"E 25°29'38.759"S 27°57'2.632"E 25°29'40.825"S 27°57'1.367"E 25°29'35.651"S 27°56'59.007"E 25°29'37.579"S		
Alternative 2 Substation		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 2 This substation is not preferred because it is located further away from the Dipompong line that the lines will have to connect to than Alternative 1. The longer line will be much more expensive and have an increased impact on the environment due to its larger footprint. Also, this line is located close to a water course on Tyne 250JQ and in the buffer zone of a seasonal wetland area which is not ideal and should be avoided. In addition to this, Alternative 2 SS site would mean that Alternative 3 line route would be followed, and this line crosses over water courses and over the M20 road to the west of Kgabalatsane before joining the existing Garankuwa-Dipompong-Dinaledi line. Construction may be problematic at the crossings and may have a negative visual impact for motorists travelling on the M20. Corner coordinates - Kgalabatsane Substation (Southern - Alt 1) 27°57'38.686"E 25°30'1.619"S 27°57'41.264"E 25°30'3.787"S 27°57'37.719"E 25°30'7.391"S 27°57'35.111"E 25°30'5.252"S	25° 30' 5" S	27° 57' 38" E

In the case of linear activities:

Alternatives for Kgabalatsane lines (A):	**Latitude (S):**	**Longitude (E):**
Alternative S1 (preferred)		
• Starting point of the activity	25° 29' 40" S	27° 57' 1" E
• Middle/Additional point of the activity	-25°29' 59 " S	27° 56' 22" E
• End point of the activity	25° 30' 22" S	27° 55' 36" E
Alternative S2 (if any)		
• Starting point of the activity	25° 29' 32" S	27° 55' 42" E
• Middle/Additional point of the activity	25° 29' 57" S	27° 56' 26" E
• End point of the activity	25° 29' 39" S	27° 57' 1" E
Alternative S3 (if any)		
• Starting point of the activity	25° 29' 32" S	27° 55' 42" E
• Middle/Additional point of the activity	25° 30' 48" S	27° 56' 43" E
• End point of the activity	25° 30' 6" S	27° 57' 39" E

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A of this form.

b) Lay-out alternatives

Not applicable due to nature of the project

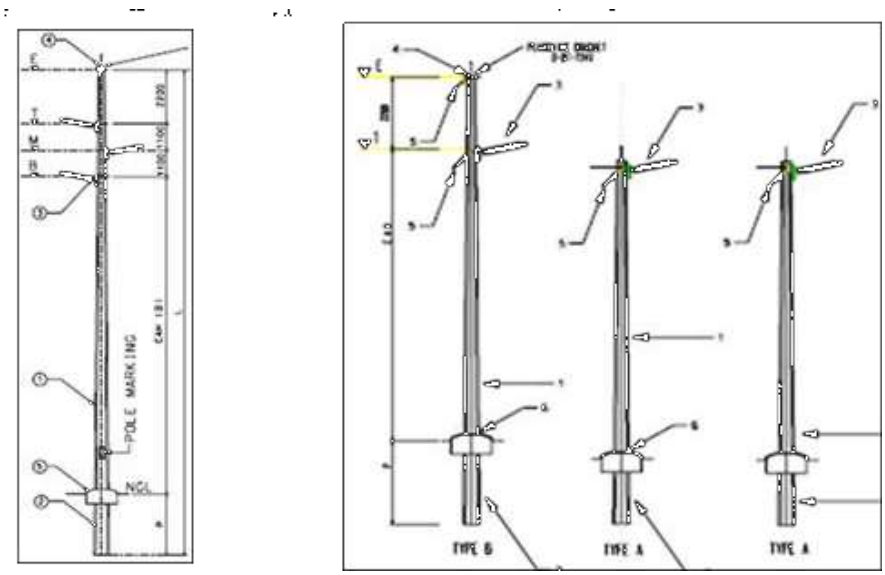
For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A.

c) Technology alternatives

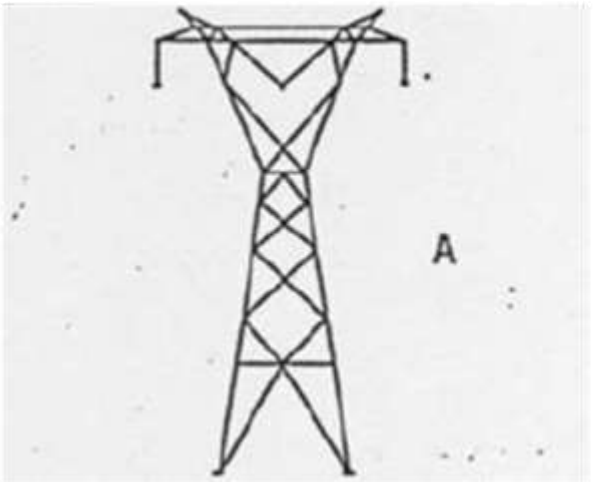
Steel Monopole Structure vs. Lattice structures

Eskom prefers the proposed steel monopole structure as the technology to be used. A steel monopole structure is considered as the most appropriate technology, and in some cases has been specifically designed for the existing environmental conditions and terrain, as specified by standard ESKOM specifications and best international practice.

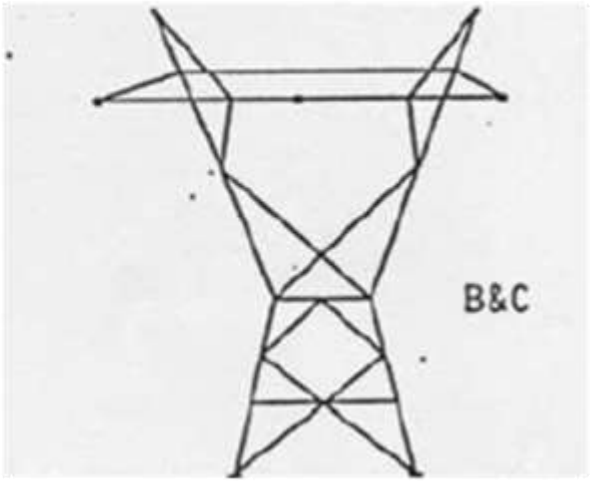


Monopole structures are considered to be cost effective and usually preferable in any areas with denser population. When compared to underground cables and other overhead structures, the speed and ease of installation of monopoles is significantly better, the impact on land is less, and the economic decisions associated with easier installations and little post-installation maintenance result in low life-cycle costs. The use of monopole structures also allows much more flexibility with respect to width of right-of-way and height requirements for structures.

Steel Lattice (Single Circuit)



Steel Lattice (Single Circuit)



The impact on the land is much less for monopole structures in comparison to other structures. In addition, the time required on the landowner's property is less for steel for monopole structures. The reduced time on the land reduces the impact on the landowner's use of his land and allows him to get back sooner to his normal operations. Lastly, the footprint required for steel monopole structures is much less when compared to other structures. The reduced footprint can require less right-of way, easier operation on the ground during construction, and allow for more natural uses of land after construction.

Overhead lines make up a large part of the interconnected system. They ensure low-loss transmission at 380-kV extra-high voltage, and thus guarantee reliable energy supply. Cables, in contrast, are predominately used in medium- and low-voltage networks, as well as for power distribution in densely built-up areas with high electricity demand. Nevertheless, underground cables have, in many cases,economic, ecological and legal disadvantages which must be carefully taken into consideretaion.

These tower structures proposed have been selected to reduce visual impacts, impact on sensitive vegetation areas, wetlands and sensitive riparian habitats.

With regards to the issue of lattice vs. monopole, Eskom generally utilises monopole structures as it is aesthetically more pleasing, has a smaller footprint and requires less steel. Monopole structures are not self-supporting hence it needs stays to hold up the strain structures whereas lattice can be self-supporting.

Option Description	Technical Viability	Financial Analysis
• Steel Monopole/3-Pole Structures	• Smaller footprint but requires stays/anchors on the strainers and bend points. • Not imposing in appearance.	R 1,650,890.64 per km
• Steel Lattice Structures	• Larger footprint and self-supporting. • Plagued by member theft. • Imposing in appearance.	R 3,779,814.53 per km
• HV Cable	• Smaller footprint. • River crossings are even more costly. • Not imposing in appearance.	R 10,915,995.00 per km

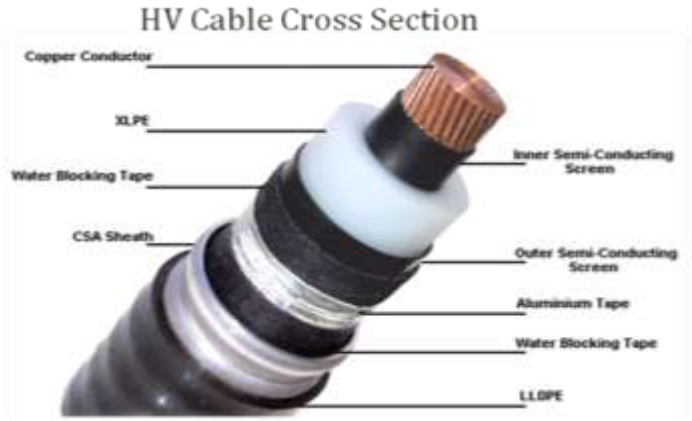
Overhead Powerline vs. Underground Cable

The alternative entails the installation of electric cables underground rather than overhead on poles and tower. The major environmental impacts of overhead lines occur when they are already in operation. They are mainly related to birds colliding with the lines as well as the visible effects on the landscape. Whereas the most harmful part of underground cables, in contrast, is their installation.

Although underground power cables can be can assist the transmission of power across densely populated urban areas Rivers and other natural obstacles; undergrounding is more expensive, since the cost of burying cables at transmission voltages is several times greater than overhead power lines, and the life-cycle cost of an underground power cable is two to four times the cost of an overhead power line.

Whereas finding and repairing overhead wire breaks can be accomplished in hours, underground repairs can take days or weeks, and for this reason redundant lines are run. Furthermore, underground power cables, due to their proximity to earth, cannot be maintained live, whereas overhead power cables can be. Operations are more difficult

since the high reactive power of underground cables produces large charging currents and so makes voltage control more difficult.



The shunt capacitance is greater with underground cables than it is with overhead, and at the same time, the series reactance is lower. That's a consequence of the spatial physics. As a result, the use of underground cables for transmission can result in significant reactive control problems at the transmission level. That in turn means that additional equipment is required to address those reactive control problems, further increasing the effective cost of underground compared with overhead.

Underground cables also cause negative ecological impacts. When burying cables, the soil must be exchanged. Furthermore, not only do the cable routes need to be kept free from deeply rooted plants, they may not be built on for any other purpose. In addition, underground cables radiate heat. This has an effect on soil humidity, which, for example, can lead to drainage or drying out of marshes.

Directional Drilling

Laying an underground cable will affect the rights of the owners and occupants of the land on which the power line is built and used, to a degree similar to the erection of an overhead line. On principle, easements --rights of use-- are recorded in the land register. The owners receive appropriate compensation. This ensures that the transmission system operator can build the power line and subsequently access it in order to carry out the necessary maintenance

and repair works. In the case of underground cable, continual and direct access for maintenance and repairs is only guaranteed when the area above the cable remains free. As a consequence, use of the underground cable route for agricultural purposes is not possible or is subject to restrictions.

These projects are Department of Energy funded and as such must be done at lowest possible cost so as to maximise the number of people that can be connected with available funds. Cable theft is a problem in the Winterveld/Garankuwa areas and this would result in frequent outages and very high replacement costs as well outage costs.

River Crossings

In general, underground cables will obviously have major Ecological impacts during their installation than during operation. Key significant activities which would have considerable consequences for the environment include:

- Earthworks/excavation / trenching
- Road construction for access purposes
- Clearing of vegetation for access purposes that may be needed for heavy machinery needed for cable transportation and trenching
- Impacts on fauna and flora species located within and around cable route
- Soil compaction will have negative impacts on both flora, fauna and general ecological environment
- Irreversible damage on the wetland and other water courses
- Potential impacts on unknown features of heritage significance

Although there are benefits in terms of use of the land (agricultural activities) after the installation of the underground cables, the negative ecological impacts and the huge cost implications outweigh the other benefits. It is for these reasons that this option is not recommended or preferred for the purposes of this project.

c) Technology alternatives (Substations, all Alternative SS sites, both areas)

Air Insulated Substation (AIS) vs. Gas Insulated Substation (GIS)
AIS are generally used where there is an overhead network and GIS on cable networks. GIS uses SF6 gasses for insulation which have a higher dielectric strength than air which is the insulation medium in AIS. GIS has a smaller foot print than AIS and is usually enclosed indoor (in a building of some sort) whereas AIS is out in the open. However GIS in the context of this project would not be a good option

as it would require that we terminate all the overhead lines onto cables creating a source of theft risk. We would still require a 132kV yard for the HV/MV transformers and busbar hence the footprint benefits of GIS would not be realised fully.

This alternative is therefore not preferred for the reasons stated above.
This would not be an option for any of the Alternative SS (Kgabalatsane)

d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)

Alternative 1 (preferred alternative)		
Alternative 2		
Alternative 3		

e) No-go alternative

No Go alternative for Kgabalatsane (KB)

The No-go option implies that the Project does not proceed, and will thus comprise of Eskom not going ahead with the construction of the proposed power lines and substations. Ideally this would be the preferred alternative as the status quo of the environment remains unchanged, however due to the growing demand for energy and activities that will require electricity in the area, this alternative is not feasible. Should Eskom rely on the existing network to supply future demand it is highly likely that present supply will be compromised due to the increased load on the network. Although the no-go alternative has been considered, it is not a practical project alternative in terms of providing stable electricity supply in the Winterveldt-GaRankuwa area as it implies a continuation of the current situation or the status quo, therefore, it doesn't render any positive outcomes.

There are low voltages problems that the customers had complained about since 2010. This was shown by the voltage dips from quality of supply. The customers also complained about the supply interruption. A loop-in loop-out will be created from the Kgabalatsane substation to the existing G-Rankuwa (Wesglass) substation (to be upgraded). This will improve the customer interruptions and also the performance of the supply. By not increasing the supply to the greater area, development will be constrained as the already existing 33kV network is operating at near-capacity and will not be able to accommodate the amount of load that will be brought by future developments. A new 132kV overhead powerline and the substation are required to strengthen the grid supply in the Winterveldt-GaRankuwa area

Paragraphs 3 – 13 below should be completed for each alternative.

3. PHYSICAL SIZE OF THE ACTIVITY

a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Kgabalatsane: Proposed substation location & alternatives	**Size of the activity:**
Kgabalatsane: Alternative A1[1] **Preferred substation**	15000 m2
Kgabalatsane: Alternative A2	15000 m2

a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):

Alternatives for Kgabalatsane substation:	**Size of the activity:**
Alternative A1[2] (preferred activity alternative)	15000 m^2
Alternative A2 (if any)	15000 m^2
Alternative A3 (if any)	m^2

or, for linear activities:

Alternatives for Kgabalatsane lines:	**Length of the activity:**
Alternative A1 (preferred activity alternative)	2761.06m
Alternative A2 (if any)	2644.24m
Alternative A3 (if any)	4960.91m

b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):

Alternative Kgabalatsane substation:	**Size of the site/servitude:**
Alternative A1 (preferred activity alternative)	100x150 = 15000m^2
Alternative A2 (if any)	100x150 = 15000m^2

or, for linear activities:

Alternatives for Kgabalatsane lines:	**Length of the activity:**
Alternative A1 (preferred activity alternative)	31m x 3000m = 93 000m^2
Alternative A2 (if any)	31m x 3000m = 93 000 m^2
Alternative A3 (if any)	31m x 4750m = 147 250 m^2

4. SITE ACCESS

Does ready access to the sites exist? **Kgabalatsane**	YES	**NO X**
If NO, what is the distance over which a new access road will be built	500 m (SS Alt 1) 1,5 km (SS Alt 2)	

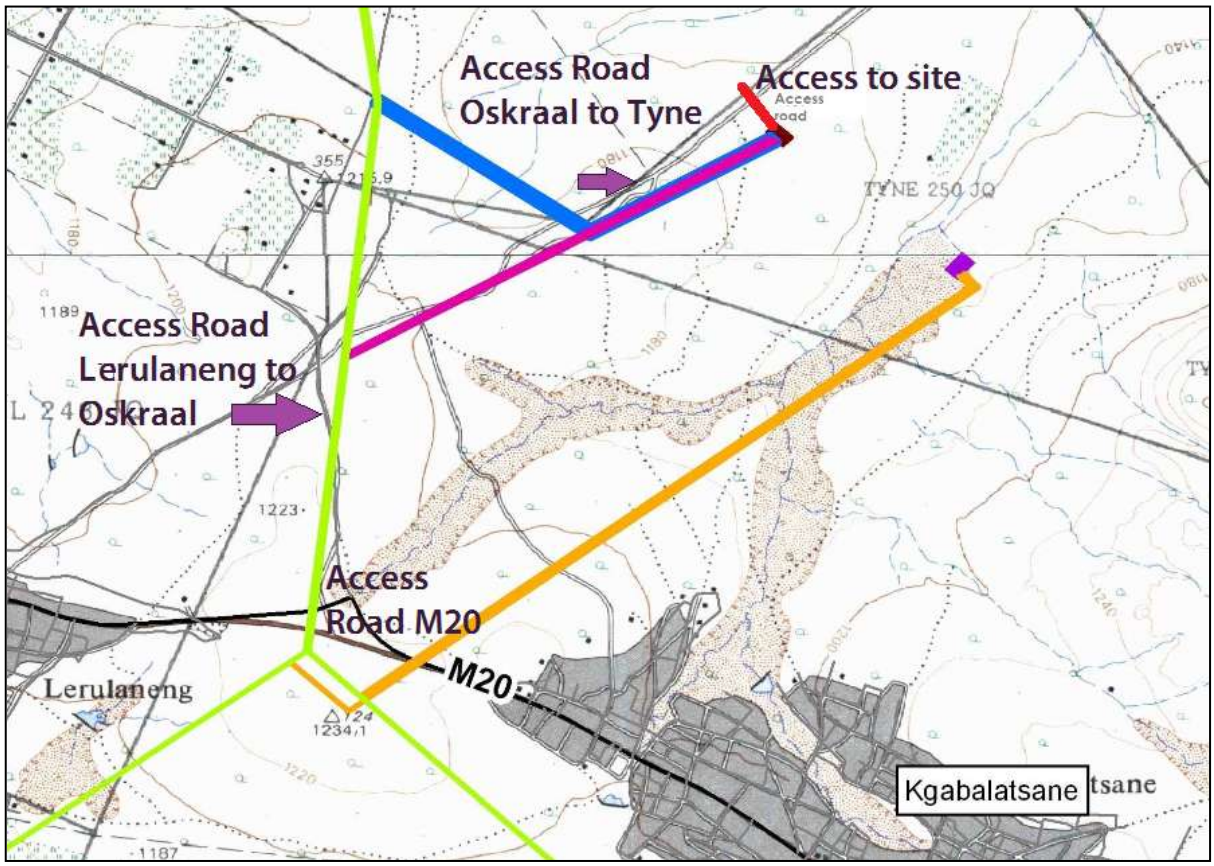
[1] "Alternative A.." refer to activity, process, technology or other alternatives.
[2] "Alternative A.." refer to activity, process, technology or other alternatives.

Describe the type of access road planned:

Some access roads may need to be upgraded to allow easy movement of construction machinery along the proposed lines. The proposed overhead distribution lines will traverse agricultural areas where there are existing access roads (M20) and tracks in the vicinity of the substation sites. New access roads will be constructed where no access routes exist in close proximity to the proposed power line route and/or to the substation. Existing Roads (e.g. the M20 and the road between Lerulaneng and Oskraal) will be used, **and a new approximately 500m long road** will be constructed to the preferred substation from the existing road between Oskraal and Makanyaneng. Temporary access routes will be used to access the lines where roads are not available during construction.

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

Kgabalatsane Access Road



5. LOCALITY MAP

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.). The map must indicate the following:

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s;)
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection).

6. LAYOUT/ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

7. SENSITIVITY MAP

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWA);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

8. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report**.** It must be supplemented with additional photographs of relevant features on the site, if applicable.

9. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of at least 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

10. ACTIVITY MOTIVATION

Motivate and explain the need and desirability of the activity (including demand for the activity):

1. Is the activity permitted in terms of the property's existing land use rights?	YES✓	NO	Please explain
The proposed routes and substations are located on privately owned agricultural and residential smallholdings. Once the proposed overhead line and substation have been constructed, limited impacts are expected. Eskom will acquire servitudes and affected property owners will be permitted to use areas underneath the lines for activities such as animal grazing. Other activities, except the construction of buildings and tall structures and growing of trees, may also continue below the lines.			
2. Will the activity be in line with the following?			
(a) Provincial Spatial Development Framework (PSDF)	YES✓	NO	Please explain
The Gauteng Employment, Growth and Development Strategy (2009) states that the infrastructure network of the Province is a strategic, socio-economic and bulk infrastructure investment and includes: transport and logistics (including roads, rail and air), Information and Communication and Technologies, schools, hospitals, clinics, libraries, universities (if applicable), **electricity services (energy),** water reticulation services, sewage and sanitation services, waste management services, and so forth. Thus the provision of electrical infrastructure is in line with SDF.			
(b) Urban edge / Edge of Built environment for the area	YES	NO✓	Please explain
The proposed distribution lines fall outside the urban edge. The proposed development does not blend in with the surrounding area's land use because there are no existing power lines within the proposed corridor (which may result in visual intrusion in the area). However, electricity distribution infrastructure is required for existing residential areas outside the urban edge. The project will strengthen the electricity distribution network in the Winterveldt-GaRankuwa area.			

(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	YES✓	NO	Please explain
The **Madibeng Local Municipality** acknowledges that the provision of electricity infrastructure is of key importance and prioritises the need to provide universal access to this service. The IDPs highlight that the area require considerable resources to eliminate the backlogs of electricity provision to ensure that the provision of service keeps pace with the demand to prevent a further accumulation of backlogs. Within the Local Municipality, the smaller villages in the rural areas have the greatest backlog. Electrification of rural homes, schools, clinics, small businesses is one the main policy considerations currently under discussion. Increased number of substations is considered as a need to increase the electricity supply within the area. Eskom will invest in the local economy by providing the infrastructure, which in turn will then assist the municipalities in reaching their objectives. In this way the proposed development is aligned with the municipal objectives and priorities for service delivery and infrastructural development in the area.			
(d) Approved Structure Plan of the Municipality	**YES✓**	NO	Please explain
The proposed project entails electricity infrastructure, which is compatible with the Gauteng Employment, Growth and Development Strategy (2009), the Madibeng Local Municipality IDP (2011-2016)			
(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)	YES	NO✓	Please explain
No EMF for area in which the route alternatives are located. The IDP (2011-2016) for Madibeng Local Municipality's Management Framework is completed but it is not yet adopted by the Council (Madibeng IDP, 2011-2016			
(f) Any other Plans (e.g. Guide Plan)	YES✓	NO	Please explain
The proposed development is aligned with Eskom's Integrated Strategic Electricity Planning (ISEP) process, which is intended to provide strategic projections of supply-side and demand-side options to be implemented in order to meet long-term load forecasts. It provides the framework for Eskom to investigate a wide range of new supply-side and demand-side technologies with a view to optimising investments and returns.			
3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?	YES✓	NO	Please explain
The proposed development is in line with the National Development Plan and Madibeng Local Municipality SDF's and IDP's, which related to the provision of infrastructure such as electricity supply. The region is an area earmarked for housing development. New housing development will require electrification which can be provided by the proposed powerline development.			

4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)	YES ✓	NO	Please explain
This project at Kgabalatsane forms **part of the network** "Garankuwa-Dipompong-Dinaledi". There are no High Voltage (HV) networks in this area and the load can thus not be connected on the 33kV network, meaning that a 132kV network solution was required. The proposed new substation at Kgabalatsane is planned in order to create capacity for the expected load. <u>Other projects that are relevant to this Kgabalatsane lines project</u> include a 132kV power line that has been proposed to from the existing GaRankuwa substation and the Dinaledi substation in the south with the proposed new Dipompong substation and the proposed new Tswaing substation in the northern extent of the proposed power line. These will be constituted of RDP houses that are expected to be constructed in the 5 year time frame. At an ADMD of 2.4kVA per connection, these connections translate to a load of 76.8MVA. The 33kV network in the area will not be able to accommodate this amount of load and is also not an optimal voltage for the distribution of this load. Strengthening is required in order to accommodate the new load in the Winterveldt-GaRankuwa area in the pursuit of universal access to electricity. The proposed Kgabalatsane Substation will provide capacity for the expected growth in the region.			
5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	YES✓	NO	Please explain
The proposed project is the construction of two 132kV Kgabalatsane SS and associated overhead distribution power line. It will not require any capacity for services such as water and sanitation from Madibeng Muncipality. It will however provide additional electricity capacity to the area.			
6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)	YES	NO✓	Please explain
The proposed project is the construction of a 132kV substation (Kgabalatsane SS) and associated overhead distribution power lines. It will not require any capacity for services such as water and sanitation from the Municipality. It will however provide additional electricity capacity to the area.			
7. Is this project part of a national programme to address an issue of national concern or importance?	YES✓	NO	Please explain
The upgrading of the electricity network and infrastructure especially the substations and transmission and distribution lines is a strategic priority towards addressing the shortage of electricity in South Africa.			

8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)	YES✓	NO	Please explain
Although the proposed development transverse agricultural and vacant lands, the location of the site was selected as such that is within or next to the centre of the load demand – Rabokala, Kgabalatsane, Ga-Rankuwa, Oskraal and Makanyaneng.			
9. Is the development the best practicable environmental option for this land/site?	YES✓	NO	Please explain
The current status quo is the best practicable environmental option. The farmlands in the study area are not economically viable agriculture units and apart from limited and informal grazing, are not utilized. The construction of the 132kV line and substation will thus not impact significantly on the current land use.			
10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES✓	NO	Please explain
The potential benefit of the proposed power lines and substations to the area lies in the stimulation of the local economy through a reliable electricity supply, which will increasingly benefit the provision of services. Furthermore, improving network reliability may reduce the number of residents who are still reliant on domestic fires, which in turn negatively impact the environment through uncontrolled harvesting of woodlands and air quality. The provision of electricity may promote local economic development and investment in the area. Provision of electricity is critical for economic development, related employment and sustainable development in South Africa. In the context of the project improvement of the 132kV supply is critical to the improvement of provision of household electricity.			
11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?	YES	NO✓	Please explain
The preferred proposed route is in part adjacent to the existing 88kV power line from Ga-Rankuwa and Dinaledi substations. No new precedent will be created.			
12. Will any person's rights be negatively affected by the proposed activity/ies?	YES	NO✓	Please explain
The proposed **Kgabalatsane SS and associated power lines** will not negatively affect any person's rights. The servitude rights for the line will be acquired by Eskom and financial compensation will be paid where applicable.			
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?	YES	NO✓	Please explain
The project is the proposed construction of an overhead electricity distribution lines and substations. Areas outside of the urban edge and rural areas do require electricity. **The urban edge will not be compromised.**			

14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	YES✓	NO	Please explain

The project will conform to the objectives of the following SIPS:

SIP 6: Integrated Municipal Infrastructure Project

Develop a national capacity to assist the 23 least resourced districts (17 million people) to address all the maintenance backlogs and upgrades required in water, **electricity** and sanitation bulk infrastructure.

SIP 10: Electricity Transmission and Distribution for all

Expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity.

15. What will the benefits be to society in general and to the local communities?	Please explain

The provision of a reliable electricity network and provision of capacity for new users.

16. Any other need and desirability considerations related to the proposed activity?	Please explain

The proposed project will ensure that economic growth continues in the region.

17. How does the project fit into the National Development Plan for 2030?	Please explain

The following NDP sections area relevant: Elements Of A Decent Standard Of Living – provision of Electricity

Women And The Plan

Access to safe drinking water, **electricity** and quality early childhood education, for example, could free women from doing unpaid work and help them seek jobs. Due to a reduction in capital spending from effect, South Africa has missed a generation of capital investment in roads, rail, ports, **electricity**, water, sanitation, public transport and housing. To grow faster and in a more inclusive manner, the country needs a higher level of capital spending.

Chapter 4: Economic Infrastructure

The proportion of people with access to the **electricity** grid should rise to at least 90 percent by 2030, with non-grid options available for the rest.

Action 20 of The National Development Plan also considers the Ring-fencing the electricity distribution businesses of the 12 largest municipalities (which account for 80 percent of supply), resolve maintenance and refurbishment backlogs and develop a financing plan, alongside investment in human capital.

Actions

21. Revise national **electrification** plan and ensure 90 percent grid access by 2030 (with balance met through off-grid technologies).

18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.

This report serves as a **Basic Assessment Report** that will investigate all potential impacts (social, economic and environmental) that may result from the development including alternatives, assess and evaluate and further provide a mitigation plan for all identified potential impacts.

19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.
Ecological, heritage, geotechnical, visual and wetland specialists were appointed to investigate potential environmental impacts. Identified environmental impacts were assessed and mitigation measures provided to control and manage these environmental impacts. Interested and Affected parties, land owners and relevant stakeholders were identified and involved throughout the Basic Assessment process and their comments will be addressed and recorded as part of this assessment.

11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
Constitution of the Republic of South Africa, Act 108 of 1996	The Constitution (section 24) makes provision for the protection of the natural environment and heritage resources through the recognition of the rights to a safe and healthy environment	Republic of South Africa	1996
Environmental Impact Assessment Regulations (Government Notice No R. 543, 544 and 546*)	The EIA regulations describe the EIA process to be followed including the public participation process, and the listed activities that may have a harmful impact on the environment and must be assessed	Department of Environmental Affairs	**2010 Regulations** applied to the project at the time of first submission of the application form.
National Environmental Management Act (NEMA), No. 107 of 1998	NEMA is the overarching environmental management legislation. The NEMA Act sets out the principles of Integrated Environmental Management (IEM). NEMA aims to promote sustainable development, with wide-ranging implications for national, provincial, and local government. Section 2 of NEMA, sets out a range of environmental principles that are to be applied by all organs of state when taking decisions that may significantly affect the environment. Section 24, as amended, states that the activities that may significantly affect the environment and require authorisation or permission by law must be investigated and assessed prior to approval.	Department of Environmental Affairs	**1998**
National Environmental Management Biodiversity Act, No. 10 of 2004 of 1989	This Act allows for the protection of species and ecosystems that administration and management of protected areas in warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources and the establishment and functions of the South African National Biodiversity Institute.	Department of Environmental Affairs *An ecological specialist was appointed for this project	**1999**
National Environmental Management: Air Quality Act No 39 of 2004	This Act aims to provide for the management of air quality in South Africa.	Department of Environmental Affairs	**2004**

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Water Act No 36 of 1998	Provides for the protection of water resources, the use of water resources, waste disposal or alteration of characteristics of watercourses (e.g. rivers, streams, wetlands, etc.) and pollution prevention. A Water Use Licence Application is made to authorise water use activities pertaining to the altering of the bed and banks of a watercourse and diverting the flow of water in a watercourse. This WULA is made as some watercourses have been identified and the construction of some tower structures within 500m of a watercourse may result.	Department of Water Affairs *A wetland specialist was appointed for this project	1998
National Environmental Management Waste Act No 59 of 2008	Makes provision for sound management of general and hazardous waste in South Africa, through the integration of a sufficient range of complementary waste management options, in line with the waste management hierarchy and internationally accepted principles of best environmental practice. Waste will be generated during the construction phase of the project.	Department of Environmental Affairs	2008
National Heritage Resources Act No. 25 of 1999	The Act aims to promote an integrated system for the identification, assessment and management of the heritage Resources in South Africa. Under section 38. (1) of the NHRA any person who intends to construct a powerline or other linear development exceeding 300m in length must notify the responsible heritage resources agency of its intention.	SAHRA *a heritage specialist was appointed for this project.	1999
Occupational Health and Safety Act No. 85 of 1993	The OHSA governs and ensures the protection of employees in the workplace. A number of permanent and contract skilled and semi-skilled workers will be involved in the construction of the different aspects of the project. Their appointment and work periods will be subject to the provisions of the OHSA.	Department of Labour	1963
The Conservation of Agricultural Resources Act No 43 of 1983	To provide for the conservation of the natural agricultural resources of the Republic of South Africa by the preservation of the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants. This act will regulate construction activities to prevent the spreading of invasive species and to ensure successful rehabilitation of the receiving environment.	Department of Agriculture, Forestry and Fisheries	1983
Public Access to Information Act No 2 of 2000	Provides the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights; and to provide for matters connected therewith. Eskom needs to acquire servitude from existing land owners, any individual owner has the right to access to any information pertaining to the project	Department of Justice	2000

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	YES	NO ✓
If YES, what estimated quantity will be produced per month?		m^3

How will the construction solid waste be disposed of (describe)?

Construction rubble/ solid waste will be temporarily stored on site in designated waste skips and then removed by an appropriate waste contractor appointed by the main construction contractor to an approved landfill site. This will be managed through the EMPr

Where will the construction solid waste be disposed of (describe)?

General waste removed from site will be disposed of at the Ga-Rankuwa Landfill Site in Garankuwa which is the nearest registered landfill. Safe disposal certificates must be obtained and kept on site for the duration of the construction phase.

Will the activity produce solid waste during its operational phase?	YES	NO ✓
If YES, what estimated quantity will be produced per month?		m^3

How will the solid waste be disposed of (describe)?

N/A

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

Ga-Rankuwa Landfill site

Where will the solid waste be disposed of if it does not feed into a municipal waste stream (describe)?

All solid waste will be disposed off at a landfill site

If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA?	YES	**NO✓**

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

Is the activity that is being applied for a solid waste handling or treatment facility?	YES	NO ✓

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM:WA must also be submitted with this application.

The most significant hazardous waste streams will be cement and used motor oils from construction vehicles. Designated hazardous store areas will be set up and the hazardous waste will be disposed of at the appropriate hazardous landfill site, which is **Ga-Rankuwa Landfill site.**

b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?	YES	NO ✓
If YES, what estimated quantity will be produced per month?		m^3
Will the activity produce any effluent that will be treated and/or disposed of on site?	YES	NO ✓

If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Will the activity produce effluent that will be treated and/or disposed of at another facility?	YES	NO ✓

If YES, provide the particulars of the facility:

Facility name:	**N/A**		
Contact person:			
Postal address:			
Postal code:			
Telephone:		**Cell:**	
E-mail:		**Fax:**	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

None, as effluent will be disposed of

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other that exhaust emissions and dust associated with construction phase activities?	YES	NO✓
If YES, is it controlled by any legislation of any sphere of government?	YES	NO✓

If YES, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.
If NO, describe the emissions in terms of type and concentration:

Emissions will be generated during the construction phase for Kgabalatsane substation and power line. Emissions generated will be in the form of dust, carbon dioxide and other vehicle emissions generated by diesel powered machinery and trucks during the construction process i.e. tip trucks, TLB's, excavators and dust from the movement of the construction vehicles. These emissions will be composed primarily of CO_2 and will be of a low concentration. However these emissions will have a short term impact on the immediate surrounding area and thus no authorisation will be required for such emissions. Appropriate dust suppression measures must be implemented (e.g. removal of vegetation in a phased manner and using recycled water for spraying dust to reduce the impacts). It is recommended that construction vehicles are regularly serviced and kept in good mechanical condition to minimise possible exhaust emissions.

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?	YES	NO ✓

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

e) Generation of noise

Will the activity generate noise?	YES ✓	NO
If YES, is it controlled by any legislation of any sphere of government?	YES	NO ✓

If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.
If NO, describe the noise in terms of type and level:

Short term noise impacts are anticipated during the construction phase of the project for Kgabalatsane substation and power line.

It is however anticipated that the noise will be localised and contained within the construction site. The noise levels are anticipated to be less during the day lesser during night time as required for suburban districts with little road traffic in terms of SANS 10103 thus no authorisation will be required.

In order to minimise the impacts of noise during the construction phase, construction activities should be restricted to between 07H00 and 17H00 Monday to Friday. This is required in order to avoid noise and lighting disturbances outside of normal working hours. All construction equipment must be maintained and kept in good working order to minimise associated noise impacts. If required, adequate noise suppression measures (i.e. screens, etc) must be erected around the point source of construction and/or operational noise pollution to reduce noise to an acceptable level. No noise will be generated during the operational phase of the development.

13. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

Municipal ✓	Water board	Groundwater	River, stream, dam or lake	Other	The activity will not use water

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:		litres
Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?	YES ✓	NO

If YES, please provide proof that the application has been submitted to the Department of Water Affairs.

A **Water Use License Application will be submitted** to Department of Water Affairs (DWA) after the Basic Assessment Report (this report) has been reviewed and the project granted Environmental Authorisation by DEA.

14. ENERGY EFFICIENCY

Describe the design measures, if any, which have been taken to ensure that the activity is energy efficient:

The project is the construction of a distribution line and does not use energy. Eskom however has introduced and champions the 49m campaign which aims to reduce National energy usage by 10%, which would be as effective as the construction of a new power station, without the potential carbon emission or cost.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

The project is the construction of a distribution line and does not use energy.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area, which is covered by each copy No. on the Site Plan.

Section B Copy No. (e.g. A): [ ]

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section? YES | NO

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

Property description/physical address:	Province	**North West Province**
	District Municipality	**Bojanala Platinum District Municipality** PO Box 1993, Rustenburg, 0300 (Cnr Beyers Naude & Fatima Bhayat Drives, Rustenburg) Tel: 014 590 4500 Fax: 014 592 6085
	Local Municipality	**Madibeng Local Municipality**
	Ward number(s)	Kgalabatsane - Ward 2
	Nearest town(s)	**Brits,** Kgalabatsane
	Farm name(s) and number(s)	Oskraal 248 JQ Syferfontein 430 JQ Remainder Tyne 250 JQ
	Portion number(s)	Portion 1 Oskraal 248 JQ Portion 0 (remainder) Syferfontein 430 JQ Portion 0 Remainder Tyne 250 JQ
	SG Codes	See below

SG 21 Digit Code(s)
(If there are more than 4, please attach a list with the rest of the codes as Appendix 5)

T	O	J	**Q**	0	0	0	0	0	0	0	0	0	**2**	**4**	**8**	0	0	0	0	**1**
T	O	J	**Q**	0	0	0	0	0	0	0	0	0	**2**	**5**	**0**	0	0	0	0	**0**
T	O	J	**Q**	0	0	0	0	0	0	0	0	0	**4**	**3**	**0**	0	0	0	0	**0**
1	**2**			**3**				**4**								**5**				

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.

Current land-use zoning as per local municipality IDP/records:	The entire area is outside the urban edge and known as "Agricultural" properties (farms). The land has not been zoned. Although the power line routes traverse over land "zoned" as agricultural, the area has never been a major crop producer. These rural areas have mainly been used for grazing with only small areas being cultivated.

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required?

YES	NO X

1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Kgabalatsane Substation Sites

Alternative S1:

Flat	1:50 – 1:20	1:20 – 1:15 X	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

Alternative S2 (if any):

Flat	1:50 – 1:20	1:20 – 1:15 X	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

Alternative S3 (if any):

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

Kgabalatsane Power Lines

Alternative S1:

Flat	1:50 – 1:20	1:20 – 1:15 X	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

Alternative S2 (if any):

Flat	1:50 – 1:20	1:20 – 1:15 X	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

Alternative S3 (if any):

Flat	1:50 – 1:20	1:20 – 1:15 X	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

2.1 Ridgeline		2.4 Closed valley		2.7 Undulating plain / low hills	
2.2 Plateau		2.5 Open valley		2.8 Dune	
2.3 Side slope of hill/mountain		2.6 Plain	x	2.9 Seafront	
2.10 At sea					

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following?

Kgabalatsane substation	Alternative S1:		Alternative S2 (if any):		Alternative S3 (if any):	
Shallow water table (less than 1.5m deep)	YES✓	NO	YES✓	NO	YES✓	NO
Dolomite, sinkhole or doline areas	YES	NO✓	YES	NO✓	YES	NO✓

Seasonally wet soils (often close to water bodies)	YES√	NO		YES√	NO		YES√	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO		YES	NO√		YES	NO√
Dispersive soils (soils that dissolve in water)	YES	NO√		YES	NO		YES	NO√
Soils with high clay content (clay fraction more than 40%)	YES	NO √		YES	NO√		YES	NO√
Any other unstable soil or geological feature	YES	NO√		YES	NO		YES	NO√
An area sensitive to erosion	YES√	NO		YES√	NO		YES√	NO

Kgabalatsane power lines	**Alternative S1:**		**Alternative S2 (if any):**		**Alternative S3 (if any):**	
Shallow water table (less than 1.5m deep)	YES√	NO	YES√	NO	YES√	NO
Dolomite, sinkhole or doline areas	YES	NO√	YES	NO√	YES	NO√
Seasonally wet soils (often close to water bodies)	YES√	NO	YES√	NO	YES√	NO
Unstable rocky slopes or steep slopes with loose soil	YES	NO	YES	NO√	YES	NO√
Dispersive soils (soils that dissolve in water)	YES	NO√	YES	NO	YES	NO√
Soils with high clay content (clay fraction more than 40%)	YES	NO √	YES	NO√	YES	NO√
Any other unstable soil or geological feature	YES	NO√	YES	NO	YES	NO√
An area sensitive to erosion	YES√	NO	YES√	NO	YES√	NO

The soil varies from gravely to sandy. In the low-lying areas clay is present in the soil. A number of rocks are present on the surface and in some areas large partly weathered granite sheets are exposed along the drainage channel.

Geologically, the area is part of the Bushveld Complex which is dominated by a large variety of igneous rocks (Lurie, 1994). All of these have been chemically weathered in the geological past to form thick regoliths and soils. The northern section of the site together with the four northernmost substation locations is underlain by the Karoo Supergroup, mafic volcanic material of the Letaba Formation and mudstones of the *Irrigasie Formation*. Soils are red-yellow apedal, freely drained with a high base status. In some areas self-mulching vertic clays are found. In these areas a fluctuating water table and prolonged periods of swelling and cracking with gilgai micro-relief (repeated mounds and depressions) are found (Mucina and Rutherford, 2006). The soils in the area are dominated by yellowish-brown sandy loams with high base status and depth of >300mm. The area is well drained; erosion and deposition by wind and, mostly, water are responsible for the transportation of soils from one location to another. The topography is flat to slightly undulating plains with some low hills (Mucina & Rutherford, 2006). The low hills comprise of rocky outcrops.

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the completion of this section. Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted.

M. J. van der Walt Engineering Geologist CC has indicated that the power line route and substation are underlain by the following geological formations:

- Fine-grained silty and sandy colluvium (transported soil), possibly with a pebble marker horizon at the bottom, both classed as Recent Deposits.
- Fine-grained (silt & clay) as well as coarse-grained (sand & gravel) alluvium, Recent Deposit.
- Pedocretes, generally in the form of ferruginous concretions or a well-developed ferricrete layer at the base of the transported soils.
- Grey to pink coarse-grained Nebo granite of the Rashoop Granophyre Suite belonging to the Bushveld Complex.
- Magnetite gabbro and diorite of the Bierkraal Magnetite Gabbro of the Rustenburg Layered Suite belonging to the Bushveld Complex.
- Granophyre of the Beestekraal Granophyre of the Rashoop granophyre Suite belonging to the Bushveld Complex.

No geological faults or dykes are indicated on the geological map over the power line routes or at or near the proposed substations' positions.

The climatic regime of the present and of the relatively recent plays a fundamental role in the development of the soil profile at any particular point below the earth's surface. As the site falls within the sub-humid part of South Africa where Weinerts climatic N-value is approximately 5, residual soils are generally shallow, transported soils vary greatly in thickness, and pedocretes where present, are likely to be in the form of calcretes and less often silcrete. Mechanical disintegration is the dominant mode of weathering.

The following development constraints **might be encountered** along the power line routes and at the substation site for Kgabalatsane. **These are directly related to the underlying geology**.

- Potentially collapsible and/or compressible transported soil (colluvium) overlying residual soil or bedrock, NHBRC class C1/S1 or C2/S2 depending on the thickness thereof.
- The possible presence of shallow rock (granite, granophyre & gabbro) or hardpan calcrete (within 1,5m of surface) could result in areas of difficult excavation, NHBRC class R. In these areas a shallow perched water table could also be present during the wet season and sub-surface drainage might be required.
- Core stones within a mass of residual soil will also result in difficult excavation in foundation trenches and might even have to be blasted for removal depending on its size.
- Potentially expansive residual gabbro or clayey alluvium, NHBRC Class H to H3 depending on the degree of expansiveness (medium to high) as well as the topographic situation. To be catered for in the design of the substations.
- The wind factor (direction and strength) should be determined and incorporated in the design of pylon foundations.
- Surface water (ponding) could be expected along the streams and adjacent vlei areas which will result in access problems for personnel and vehicles. This problem would be more severe during the wet season.
- Floodplains and areas in close proximity to streams need to be avoided.
- No pylons should be placed in or close to pans, vlei areas and wetlands.
- Steep slopes (>45°) and areas immediately below them should be avoided for the siting of pylons and maintenance roads wherever possible. These areas are subject to slope failure and are vulnerable to erosion.
- A shallow perched water table could saturate foundation soils and have a detrimental effect on bearing capacity at the substation sites. A shallow perched water table might be present due to the

impermeable black turf overlying residual gabbro

- Groundwater pollution is a huge threat to the groundwater (a scarce resource) and adequate measures need to be implemented for the disposal of sewage and waste water etc. During the construction process.

4. GROUNDCOVER

Indicate the types of groundcover present on the site. The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Kgabalatsane substation and lines

Natural veld - good condition[E]	Natural veld with scattered aliens[E]	Natural veld with heavy alien infestation[E]	Veld dominated by alien species[E]	Gardens
Sport field	Cultivated land	Paved surface	Building or other structure	Bare soil

If any of the boxes marked with an "[E] "is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

The Kgabalatsane study area is characterised by its natural vegetation cover and low intensity farming practices. The rural settlements are fragmented and are considered small developments in the landscape thereby maintaining a dominant natural character. Seringa Hill is a distant and distinct topographical feature.

The Kgabalatsane study area is situated in the Marikana Thornveld (SVcb6). A large part of the study area is natural veld. The disturbed areas are degraded due to human impacts such as borrow pits, dumping of solid waste in the borrow pits, vehicle tracks; footpaths, frequent fires, grazing, crop production, storm water drainage, donga erosion, etc. A number of protected species were found on site.

5. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

Perennial River	YES	**NO**	UNSURE
Non-Perennial River (stream crossing for Alternative 2)	**YES X**	NO	UNSURE
Permanent Wetland	YES	**NO**	UNSURE
Seasonal Wetland	YES	**NO**	UNSURE
Artificial Wetland	YES	**NO**	UNSURE
Estuarine / Lagoonal wetland	YES	**NO**	UNSURE

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

Rainfall & climate
The study area receives summer rainfall and winters are typically very dry with frequent frost. The southern extent of the proposed development the mean monthly maximum and minimum is 35.3°C (January) and -3.3°C (June) (Mucina & Rutherford, 2006). Frost is less frequent in the northern extent of the proposed development (e.g. the Tswaing-area) with high temperatures recorded already in early summer. Annual rainfall varies from about 600-700mm in the southern extent of the proposed development to about 500 -650mm in the northern extent of the proposed development. Relative humidity is typically low and ranges from 28-30%. Annual rainfall varies from about 600-700mm in the southern extent of the proposed development to about 500-650mm in the northern extent of the proposed development. This climatic conditions lead to a relatively high environmental variability, with the danger of soil being exposed due to lack of vegetation, even by frost damage, and veld fires (especially during the dry season), and then becoming even more vulnerable to runoff, erosion and gully formation (Croucamp, 2004).

A number of drainage channels are present in the area where the proposed power line routes and substation are planned. These channels are mostly dry. During rain events water drains towards the north-east.

6. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

Natural area X	Dam or reservoir	Polo fields
Low density residential	Hospital/medical centre	Filling station **H**
Medium density residential	School	Landfill or waste treatment site
High density residential	Tertiary education facility	Plantation
Informal residential**A**	Church	Agriculture
Retail commercial & warehousing	Old age home	River, stream or wetland
Light industrial	Sewage treatment plant**A**	Nature conservation area
Medium industrial **AN**	Train station or shunting yard **N**	Mountain, koppie or ridge
Heavy industrial **AN**	Railway line **N**	Museum
Power station	Major road (4 lanes or more) **N**	Historical building
Office/consulting room	Airport **N**	Protected Area
Military or police base/station/compound	Harbour	Graveyard
Spoil heap or slimes dam**A**	Sport facilities	Archaeological site
Quarry, sand or borrow pit	Golf course	Other land uses (describe)

If any of the boxes marked with an "N "are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

N/A

If any of the boxes marked with an "An" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

N/A

If any of the boxes marked with an "H" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

N/A

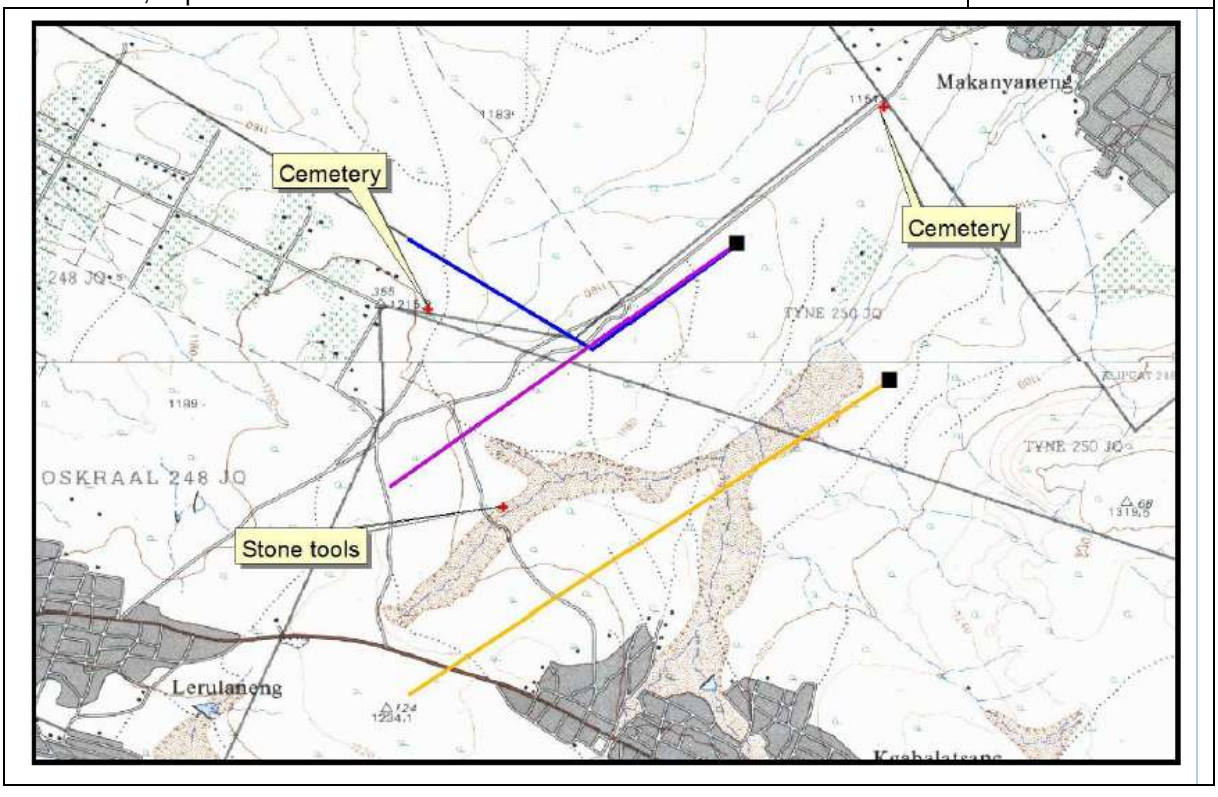
Does the proposed site (including any alternative sites) fall within any of the following:

Critical Biodiversity Area (as per provincial conservation plan)	YES	**NO X**
Core area of a protected area?	YES	**NO X**
Buffer area of a protected area?	YES	**NO X**
Planned expansion area of an existing protected area?	YES	**NO X**
Existing offset area associated with a previous Environmental Authorisation?	YES	**NO X**
Buffer area of the SKA?	YES	**NO X**

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

7. CULTURAL/HISTORICAL FEATURES

Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain:	**YES X**	NO
	Uncertain	



Stone Tools on Farm: Syferfontein 430JQ -Coordinates S 25.51149, E 27.93442

A significant number of stone tools dating to the Middle Stone Age have been identified in this region of the water course. Formal stone tools as well as cores were identified. All were made from felsite. As the material is found on the surface in a streambed, the tools are viewed not to be in its original context, lowering significance very much**. It is unlikely,** considering the route alternatives, that the power lines will have an effect on the material found here.

Burial Site on Farm Oskraal 248JQ coordinates S 25.49670, E 27.92882

A large operational community cemetery is well-fenced off and has a significance of "High on a local level – Grade III" The proposed power line would pass some distance (c. 400m) from this site and **it is unlikely, considering the route alternatives, that the power lines will have an effect on this site**.

If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:

A specialist was appointed for the project.

J van Schalkwyk (D Litt et Phil), Heritage Consultant
ASAPA Registration No.: 168
Principal Investigator: Iron Age, Colonial Period, Industrial Heritage
Postal Address: 62 Coetzer Avenue, Monument Park, 0181
Mobile: 076 790 6777
Fax: 012 347 7270
E-mail: jvschalkwyk@mweb.co.za

To summarise:
The cultural landscape qualities of the region is made up of a pre-colonial element consisting of limited Stone Age and Iron Age occupation, as well as a much later colonial (farmer) component, which gave rise to an urban component.

Although a number of sites of cultural heritage significance were identified in the vicinity of the proposed power line and substation, the development would not have an impact on any of the existing sites.

Therefore, from a heritage point of view we recommend that the proposed development can continue if the proposed mitigation measures are accepted. We recommend that if archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage consultant so that an investigation and evaluation of the finds can be made.

See HIA report attached.

Will any building or structure older than 60 years be affected in any way?	YES	**NO X**
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	**NO X**

If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

8. SOCIO-ECONOMIC CHARACTER

a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

Level of unemployment:

Kgabalatsane project area is located in the Madibeng Local Municipality and has unemployment rate of 34%.

Economic profile of local municipality:

Kgabalatsane is located in the Madibeng Municipal area. This area is characterized by a diverse economy, including strong agriculture, mining, and manufacturing and tourism sectors. Although these sectors already contribute a large percentage to the aggregate Gross Geographic Product

(GGP), they still have the ability and potential to induce and accommodate economic growth and development. The most prominent economic activities include manufacturing, mining and agriculture. Mining is tending to out-perform the agriculture sector. The area is the world's third largest chrome producer and includes the richest Platinum Group Metals Reserve (situated on the Merensky Reef). Manufacturing is the dominant sector, with motor industry related activities predominant (Madibeng IDP, 2011-2016).

Level of education:

In the Madibeng LM, a percentage of **7.30%** of residents have no schooling and approximately 7.30% of Madibeng's population have completed Matric.

*Note: *The measure of achievement of the education system is observed by looking at the highest level of education for those individuals aged 20 years and above.*

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	**R11,591,223.01**	
What is the expected yearly income that will be generated by or as a result of the activity?	This information will be provided at a later stage	
Will the activity contribute to service infrastructure?	YES✓	NO
Is the activity a public amenity?	YES✓	NO
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	Unknown	
What is the expected value of the employment opportunities during the development and construction phase?	Unknown	
What percentage of this will accrue to previously disadvantaged individuals?	Unknown	
How many permanent new employment opportunities will be created during the operational phase of the activity?	Unknown	
What is the expected current value of the employment opportunities during the first 10 years?	Unknown, these assessments are done late in the process, during construction and operational phase.	
What percentage of this will accrue to previously disadvantaged individuals?	Unknown, these assessments are done late in the process, during construction and operational phase.	

9. BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult http://bgis.sanbi.org or BGIShelp@sanbi.org. Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/

EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

a) Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)

Systematic Biodiversity Planning Category				**If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan**
Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	Other Natural Area (ONA) ✓	No Natural Area Remaining (NNR)	The area is rural and "zoned" as Agricultural, with some natural areas remaining. According to the North West Biodiversity Conservation Assessment the proposed **substation for Kgabalatsane is situated outside any CBA.**
Critical Biodiversity Area (CBA) ✓	Ecological Support Area (ESA) ✓	Other Natural Area (ONA)	No Natural Area Remaining (NNR)	***Note CBA** - *Some of the proposed powerline alignment as well as the proposed substation and alternatives for Kgabalatsane locality are situated within a CBA 2, indicating that these areas are remaining natural patches larger than 5ha of provincially endangered and vulnerable ecosystems (vegetation types), i.e. the amount remaining intact of this vegetation type is less than 60%. Any further transformation of these vegetation types should be limited to existing transformed or heavily degraded areas. Therefore the proposed routes should be discussed with the North West Department of Agriculture, Conservation, Environment and Rural Development and the route be aligned as much as possible within already transformed vegetation.*

b) Indicate and describe the habitat condition on site

Habitat Condition	**Percentage of habitat condition class (adding up to 100%)**	**Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).**
Natural	20%	Very little natural habitat is left in the area where the lines and substation are proposed
Near Natural (includes areas with	20%	Alien infestation occurs in the area where the lines and substation are proposed. Grazing and harvesting of fire

low to moderate level of alien invasive plants)		wood in the area has resulted in the decline of natural vegetation.
Degraded (includes areas heavily invaded by alien plants)	40%	Degrading has occurred in the area where the lines and substation are proposed, with areas of erosion dongas and exposed sand.
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	20%	The surroundings in the area where the lines and substation are proposed are rural in nature, but have somewhat been transformed with farming activities (grazing) and unpaved local roads.

c) Complete the table to indicate:

(i) the type of vegetation, including its ecosystem status, present on the site; and

(ii) whether an aquatic ecosystem is present on site.

Terrestrial Ecosystems		**Aquatic Ecosystems**						
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Critical	Wetland (including rivers, depressions, channelled and unchanneled wetlands, flats, seeps pans, and artificial wetlands)			Estuary		Coastline	
	Endangered							
	Vulnerable							
	Least Threatened	**YES**	NO	UNSURE	YES	**NO**	YES	**NO**
	Endangered							
	Vulnerable							
	Least Threatened	**YES**	NO	UNSURE	YES	**NO**	YES	**NO**

d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)

The vegetation is mostly *Combretum* woodland on shallow rocky soil. Prominent species include the woody *Terminalia sericea, Burkea africana, Combretum apiculatum, Combretum zeyheri, Peltophorum africanum, Grewia flava, Searsia leptodictya,* the grasses *Perotis patens, Eragrostis rigidior, Eragrostis pallens, Panicum maximum, Anthephora pubescens* and the forbs *Waltheria indica, Hermannia lancifolia, Kyphocarpa angustifolia ,Indigofera daleaoides* and *Agathesanthemum bojeri*.

Two different vegetation units were identified in the area where the proposed Kgabatsane power line routes are planned. They are the:

10. Seasonal drainage channels including dongas &
11. *Dichrostachys cinerea-Peltophorum africanum* open to closed shrubland.

A number of drainage channels are present in the area where the proposed power line routes and substation are planned. These channels are mostly dry. During rain events water drains towards the north-east. The soil varies from gravely to sandy. In the low-lying areas clay is present in the soil. A number of rocks are present on the surface and in some areas large partly weathered granite sheets are exposed along the drainage channel.

The vegetation is characterised by the prominence of a mixture of species such as the trees *Ziziphus mucronata* and *Euclea undulata*. Due to the high runoff and sandy nature of the soils not much water is retained after rain events. Along these drainage lines no aquatic or riparian plant community occurs due to a lack of water. The nearby woody vegetation belongs to the dominant vegetation type of the area namely the *Dichrostachys cinerea-Peltophorum africanum* open to closed shrubland. The grass component along these drainage channels is normally overgrazed. From a plant ecological point of view these areas do not have a high conservation value, however from anecosystem functioning point of view these areas have a high conservation value due to their water channeling function and the retention of water in small pools for short periods.

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

Publication name	Daily Sun	
Date published	16 January 2015	
Site notice positions	**Latitude**	**Longitude**
	Kgabalatsane Alt 1	
	-25.49435 (25° 29' 40" S)	27.95036 (27° 57' 1" E)
	-25.49963 (25°29' 59 " S)	27.93954 (27° 56' 22" E)
	-25.50620 (25° 30' 22" S)	27.92655 (27° 55' 36" E)
	Kgabalatsane Alt 2	
	-25.49211 25° 29' 32" S	27.92825 27° 55' 42" E
	-25.49908 25° 29' 57" S	27.94063 27° 56' 26" E
	-25.49422 25° 29' 39" S	27.95022 27° 57' 1" E
	Kgabalatsane Alt 2	
	25° 29' 32" S	27° 55' 42" E
	25° 30' 48" S	27° 56' 43" E
	25° 30' 6" S	27° 57' 39" E
Date placed	**15 January 2015**	

Include proof of the placement of the relevant advertisements and notices in Appendix E1.

2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 41(2)(e) and 41(6) of GN 733.

The Methodology that has been adopted to ensure a highly consultative and interactive public participation process is outlined below.

Identification of Interested and Affected Parties (I&APs)

The interested and affected parties (I&APs) in and around the study area have been identified and a dedicated stakeholder database for the project has been developed. The stakeholder database has been split in two, i.e. one for the landowners and the other for the various I&APs, NGOs, Government departments, etc. A dedicated stakeholder database for the project is fundamental to the ultimate success of the consultation process.

The proposed project and its BAR process were announced in the study area in the following ways:

Site Visit

A site visit was conducted on the 15th January 2015, at which time Knock and Drop notifications were distributed. The site visit was also used to identify additional key stakeholders, interested and affected parties (I&APs), place site notices as well as distribute the public participation documents (letter to stakeholders, comment, sheet and BID) to the community. During this process the public participation informed the interested and affected parties (I&APs) about the project and how they can participate.

Media Announcements
An English newspaper Advertisement was compiled and placed on the Daily Sun Newspaper on 16 January 2015 informing stakeholders about the proposed project and inviting them to participate and register as interested and affected parties (see **Appendix E1**).

Land Owner Letters
Letters to land owners introduced the project provided the rationale for the project, the BAR and public participation processes to be followed in the project, etc. The information was available in English. (see **Appendix E2 for Letters & distribution list**).

Notice boards
Site notices were fixed at various conspicuous areas along the route alternatives for the Power Line. (see **Appendix E1 for proof of Site Notices**).

Key stakeholders (other than organs of state) identified in terms of Regulation 41(2)(b) of GN 733

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
Mr Machete Marcus	Ward Councillor, Kgabalatsane Ward 10	0782771338
Mr Masina Sipho	Ward Councillor, Rabokala Ward 35	0721382159

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E2. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

No members of the public have registered as I&APs, so on 23 March 2015, but discussions were held with the community representatives:

4. Bakwena ba Mokgopa Traditional Authority at the Traditional Authority offices
5. Ward Committee representatives for wards 10 and 35 (Clr. Machete and Clr Masina) and key stakeholders representative of Kgabalatsane (Pre-schools; veterans; electricity; business)
6. Klipgaat Ward 36 Councilor – Clr. Raseroka

Summary of main issues raised by I&APs	Summary of response from EAP
In the presentation it is mentioned that two substations are being considered. Does this mean that two substations are going to be constructed in our area or two alternatives are being considered to decide on the position of one	Application for Environmental Authorisation has originally been made for the substations (one in Wesglass and one in Kgabalatsane). The Wesglass component of the application has been rejected and this report is now for the

Summary of main issues raised by I&APs	Summary of response from EAP
substation?	Kgabalatsane component only. The maps show an alternative and a preferred location for the substation and for the line.
In building the new substation are you considering increasing the reliability of electricity supply in Kgabalatsane only or the project will also benefit other areas like Dipompong?	The project as a whole is substantial and Eskom planned to develop it in stages. The re are two substations to be constructed in the area (new Wesglass sites are under investigation and will be applied for at a later stage). For each substation alternative sites are usually investigated. Mr Masemola explained that the project introduced previously is a precursor to this one
Presentation has just been done; does it mean the council is expected to give comment now?	Mr Mohlala explained that a Draft Basic Assessment Report will be made available for public scrutiny. Forty days comment period will be allowed.
Is this new project being planned because of the current load shedding incidences or it has always been in the plan of Eskom for the area?	The project has been planned as part of the regional distributional network, and not due to the load shedding incidents
The process of elucidating comments from the public by way of distributing reports at different strategic places is considered to be ineffective because very few people actually go out there to read these reports. The council proposes that a meeting be arranged where members of the community can be addressed by the study team about the proposed project	A meeting will be considered, and the community will be informed via councillors. The IAPs that have been registered during the period after the project was announced, will receive invitations via e-mail and/or phone.
The issue of how servitude is acquired and how compensation will be paid for must be explained to the community at large to eliminate all suspicions of mismanagement of the money paid for servitude acquisition	The issue of land rights and acquisition will be explained at future discussions with land owners and IAPs.
The project must be labor intensive so that local people can get some jobs	Eskom has a policy of utilising local labour for certain aspects of the work, but much of the work requires advanced skills and machinery.
What are the timeframes for the construction of this project	At this stage Eskom is still negotiating for servitude for the first project. For now Eskom is estimating 2017 as the target date for construction of the second phase (Kgabalatsane)
The project is welcomed but Eskom must first resolve the issue of unpaid servitudes for existing powerlines. Presentations on the outstanding payment have been made to Eskom but they are not being attended to.	This issue falls outside the scope of this project, but the responsible representative at Eskom will investigate any such claims.
The attendees indicated that the project is welcomed and they wanted to know if the project will help Eskom to solve the electricity problem in the area.	The offer is appreciated. Eskom is dedicated to improving service provision.
The exact location of the substation was	The location was explained where the substation

Summary of main issues raised by I&APs	Summary of response from EAP
discussed as some members wanted clarification on the position of the substation	was going to be located.
Attendees wanted to know about the timeframe of for construction	It was explained that the expected date is late 2017.
One member of the local community confirmed that the project has been explained to the public and generally the public welcomes the project	The attitude is welcomed. Thank you.
The councillor explained that power cut was very frequent in December and it has been found that people from the surrounding squatter area were illegally tapping electricity from the paying. The councillor mentioned that the matter was reported and Eskom does not seem to take is serious.	It was advised that such matters be reported to Eskom in Rustenburg

7. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to the Final BAR as **Appendix E3.**

8. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
Department of Water Affairs	Mr Justice Maluleke	082 804 5490	-	teo@dwa.gov.za	Bothongo Plaza East, 15th Floor, 285 Schoeman Street, Pretoria, 0001
Madibeng Local Municipality	Mr Mpho Magasa	012 318 9299	086 265 3616	mphomagasa@madibeng.gov.za	P O Box 106, Brits,0250
	Sipho Masina	0721382159	-	-	
	Marcus Machete	0782771338	-	-	
North West Province Department of Rural Environmental & Agricultural Development	B. Sebogodi Dr James Moroka Drive	018 389 5666	Fax (018) 392 4377	bsebogodi@nwpg.gov.za	Private Bag X65, MMABATHO 2735

Include proof that the Authorities and Organs of State received written notification of the proposed activities as appendix E4.

No comments were received from these stakeholders during the review period for the DBAR.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

9. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as appendix E5.

Copies of any correspondence and minutes of any meetings held must be included in Appendix E6.

Public Participation for the Garankuwa Project (minutes attached)

Target Audience	Time	Venue
Bakwena Ba Mokgopa Tribal Authority	09H00 **23 April 2015**	Traditional Authority Office
Ward Committee and Community stakeholders (Kgabalatsane)	10H30 **23 April 2015**	Kgabalatsane Community Hall
Ward Committee and Community stakeholders (Oskraal)	12H00 **23 April 2015**	Oskraal community Hall
Ward Committee and Community stakeholders (Klipgat)	13H30 **23 April 2015**	Thutha Primary School

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

- **Impact Assessment and Rating Methodology**

The significance of impacts will be rated from **Low, Medium** to **High** where:

Low: Little influence on the receiving environment
Medium: Will have an influence on the receiving environment unless mitigated
High: Will have an influence on the receiving environment regardless of mitigation
Positive: Impacts that will lead to an improvement in the status quo, e.g. improve electricity supply or protect the environment

Please also refer to the draft EMPr, Specialist assessment and Eskom‘s minimum standards for vegetation management and erosion control reports for details on other applicable mitigation measures

ASSESSMENT OF KGABALATSANE POWER LINES ROUTES (PREFERRED AND ALTERNATIVES)

Note - For the purposes of this assessment and clarification, the proposed **power line routes for Kgabalatsane **and alternatives** located to the north of Rabokala (on Portion 1 of the farm Oskraal 248 JQ & Remainder of farm Tyne 250JQ) will be **assessed collectively** as these follow a similar geographical environment. Impacts from the abovementioned powerlines are likely to be similar.* **Notes will be made should significant differences between sites or alternatives occur, to indicate if and why a particular alternative is perceived to be less favourable than another**.

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
CONSTRUCTION PHASE IMPACTS				
Impact on Fauna ***similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments***	***Direct impacts:*** • Loss of faunal habitat / Fragmentation from the clearing of vegetation communities for construction of the associated powerline infrastructure and servitude • Faunal Disturbance from construction activities i.e. noise • Killing and snaring of fauna species may occur from construction personnel	High	• Only areas where construction is to occur should be cleared of vegetation; • No natural watercourses, pans, or wetlands should be disturbed by the development with a 500m buffer zone (marked during the construction phase) allowed for between the edge of any of the above mentioned features or an appropriate buffer zone as determined by a wetland specialist; • The extent of the construction should be confined to disturbed areas or those identified as having a low / medium ecological sensitivity and demarcated. • Where areas of high ecological sensitivity need to be disturbed, the necessary permits and mitigation measures recommended by the wetland specialist should be implemented. • No construction vehicles or personnel should be allowed to leave the demarcated area unless authorised to do so • Areas identified with high ecological sensitivity should be avoided during construction activities. • Areas that are not part of the site development plan should be marked as no-go zones; • The development should promote connectivity between ecologically important habitats by retaining natural corridors for the movement of fauna;	**Medium**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			• Roads should be planned to encourage faunal dispersal and minimize fragmentation of ecologically sensitive areas. Roads should preferably be maintained as gravel tracks; • Construction activities should be limited to daylight hours; and • Construction vehicles transporting materials to and from the construction site must be covered to reduce the formation of dust. • Construction personnel should be informed of the Animal Protection Act no. 71 of 1962 and encouraged not to harm any wildlife; and • Construction personnel should undergo awareness training regarding fauna assemblages and the correct procedures to follow should fauna be found within the site. They should be encouraged • not to harm any wildlife. They should also be informed of any policies and procedures applicable for fauna and the environment.	
Impacts on Avifauna ***similar for Alt 1 Alt 2 and Alt3 alternatives. Very few species were identified that could be impacted upon***	*Direct impacts:* Displacement due to habitat destruction and disturbance	Low	Restrict the construction activities to the construction footprint area. Avoid the removal of large trees.	**Low**
	Collisions with the earth wire of the proposed 132kV line - the greatest risk of collisions power lines.	Medium	• The spans that cross drainage lines and wetland areas should be marked with Bird Flight Diverters on the earth wire of the line, five metres apart, alternating black and white • Identified high risk sections of the power line to be installed with a suitable anti bird collision marking device approved by Eskom, and as per Eskom standards.	**Low**
	Electrocutions - Raptors and vultures that may occasionally forage in the study area	Medium	The poles should be fitted with bird perches on top of the poles to draw birds, particularly vultures, away from the potentially risky insulators	**Low**
	Indirect impacts None identified	N/A	N/A	**N/A**
	Cumulative impacts None identified	N/A	N/A	**N/A**
Impacts on Flora ***similar for Alt 1 Alt 2 and Alt3***	• Impact on riparian and wetland areas, as well as natural bushveld	Medium	• The route alignments must be fixed through areas with the least vegetation sensitivity. • A temporary fence or demarcation must be erected around the	**Low**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
alternatives due to similar environments and disturbed nature of the surrounding land			construction area (include the servitude, construction camps, areas where material is stored and the actual footprint of the development) to prevent access to sensitive environs. • Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area. • No open fires are permitted within naturally vegetated areas. • Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas. • A vegetation rehabilitation plan should be implemented. Grass can be removed as sods and stored within transformed vegetation – remove alien invasive vegetation prior to storing grasslands sods in transformed areas. Smaller shrubs and bulbs should also be removed and used for rehabilitation. The plants must preferably be removed during the winter months and be replanted by latest springtime. The grass sods should not be stacked on top of each other. Once construction is completed, these sods should be used to rehabilitate the disturbed areas from where they have been removed. In the absence of timely rainfall, the sods should be watered well after planting and at least twice more over the next 2 weeks. • Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority. • No activities should take place during rainy events and at least 2 days afterwards.	**Low**
Similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments and disturbance of plants in all areas.	Possible destruction of plants of conservation concern and protected tree species		• Prior to construction, the final route alignment should preferably be walked by a specialist to identify any possible plant species of conservation concern as well as protected tree species. Note that this should be done in the growing season of plants (Oct-March). • Although the secondary bushveld is regarded by this report as posing low constraint to the proposed powerline development, development should proceed with caution and it is advised that the	**Low**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			final route alignment be walked by an ecologist or botanist and these plants removed and conserved if found to be within the development footprint. • Protected tree species was confirmed within the secondary bushveld. • The protected tree species along the powerline routes and within the substation footprint should preferably not be removed and only pruned where necessary. Note that removal and pruning will require a permit from the Department of Agriculture, Forestry and Fisheries (DAFF). • The population of *Gladiolus cf sericeovillosus* should be avoided by the proposed line. If not possible, these plants should be removed and relocated to suitable habitat nearby or kept under suitable growing conditions and re-established during rehabilitation of the construction footprint (Note, these plants may only be removed with the permission of the provincial authority - permit). • Implement a Plant Rescue and Rehabilitation Plan: Where the plants of conservation concern are deemed to be under threat from the construction activity, the plants should be removed by a suitably qualified specialist and replanted as part of vegetation rehabilitation after the construction. • Construction workers may not tamper or remove these plants and neither may anyone collect seed from the plants without permission from the local authority. • Cordon off the sensitive vegetation that house the protected plant species and the plants of conservation concern and protect from construction activities and vehicles.	
The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments	***Indirect impacts:*** Spread of alien invasive vegetation	Medium	• Alien invasive species that were identified within the study area and in specific along the final route alignment should be removed prior to construction-related soil disturbances. • Compile and implement an alien invasive monitoring plan to remove alien invasive plant species along the chosen route alignments, prior to construction.	**Low**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			• By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation. • All alien seedlings and saplings must be removed as they become evident for the duration of construction. • Manual / mechanical removal is preferred to chemical control. • All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the construction areas. This should be verified by the ECO.	
	Cumulative impacts None identified	N/A	N/A	**N/A**
	Indirect impacts: Alteration of water quality – increasing the amounts of nutrients (phosphate, nitrite, nitrate) through disposal or discharge of human (including partially treated and untreated) sewage during the construction phase of the development	Medium	• Provision of adequate sanitation facilities located outside of the wetland/riparian area or its associated buffer zone • Establishment of buffer zones to reduce nutrient inputs in diffuse flow • Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation.	**Medium**
	Alteration of water quality – toxic contaminants (including toxic metal ions (e.g. copper, lead, zinc) and hydrocarbons and discharge of solvents, and other industrial chemicals	Medium	• After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land shall be left in a condition as close as possible to that prior to use. • Ensure that maintenance work does not take place haphazardly, but, according to a fixed plan, from one area to the other. • Maintenance of construction vehicles • Control of waste discharges • Guidelines for implementing Clean Technologies • Maintenance of buffer zones to trap sediments with associated toxins	**Medium**
	Cumulative impacts: Changing the amount of	High	• Construction in and around watercourses must be restricted to the dryer winter months.	**High**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
	sediment entering water resource and associated change in turbidity (increasing or decreasing the amount) through earthwork activities, vegetation clearing, disturbance of soil and slopes through creation of roads and tracts, changes and run off characteristics and erosion		• A temporary fence or demarcation must be erected around the works area to prevent water runoff and erosion of the disturbed or heaped soils. • Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas. • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005). • A vegetation rehabilitation plan should be implemented. • Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. • Rehabilitation plans must be submitted and approved for rehabilitation of damage during construction and that plan must be implemented immediately upon completion of construction. • Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular and pedestrian access. • Ideally, the rehabilitated construction footprints, especially on slopes and along riparian areas, must be fenced to prevent pedestrian access and trampling. Once rehabilitation was observed to be successful during monitoring, the fence may be removed (at least two years). • During the construction phase measures must be put in place to control the flow of excess water so that it does not impact on the surface vegetation. • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas. • Runoff from roads must be managed to avoid erosion and pollution problems. • Implementation of best management practices Source-directed	

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			controls • Buffer zones to trap sediments	
	Changing the physical structure within a water resource (habitat) through encroachment to achieve maximum commercial returns, deposition of wind-blown sand and loss of fringing vegetation and erosion	High	• Other than approved and authorized structure, no other development or maintenance infrastructure is allowed within the delineated wetland and riparian areas or their associated buffer zones. • Demarcate the wetlands and riparian areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas • Linear developments (e.g. roads) should span the watercourse • Weed control in buffer zone • Monitor rehabilitation and the occurrence of erosion twice during the rainy season for at least two years and take immediate corrective action where needed. • Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance of the powerline and take immediate corrective action where invasive species are observed to establish.	**Medium**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
Impacts on Heritage Resources ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments and relative distance from the findings that were made by the Heritage Specialist***	***Direct impacts:*** **Impacts on graves** - The proposed study area has a number of burial places ranging from a large formal cemetery, to individual graves located in the vicinity of abandoned homesteads. Although a number of sites of cultural heritage significance were identified in the vicinity of the proposed power line and substation, the development would not have an impact on any of the existing sites.	High	All the identified burial places are well demarcated and visible and would therefore be easily avoided. The power lines are routed to by-pass the various burial places and that they are demarcated with danger tape for the duration of the power line construction. To summarise: If archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage consultant so that an investigation and evaluation of the finds can be made.	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Visual Impacts	***Direct impacts:*** • Removal of vegetation from construction activities • Construction of new access roads • Construction of camps and work force All these activities will impact on the visual value and quality of the landscape character	Medium	• Locate construction camps and stock yards in the least visible areas or locate it on areas that are already disturbed such as agricultural fields for example; The screening capacity of the site can be temporarily enhanced through the erection of a 3 m high shade cloth fence around the construction camp and substation site during construction. The colour of the shade cloth should be similar to that of the adjacent vegetation, i.e. a light brown or khaki green; • Keep the construction camp and construction area neat and tidy at all times. Remove any waste products from the site or contain it in an enclosed area out of sight from viewers; • Establish limits of disturbances during construction through the	**Low**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
	especially in the areas that are considered natural.		demarcating of the construction areas to prevent unnecessary damage to vegetation; • Keep to existing road infrastructure as far as possible to minimise the physical damage to vegetation in the power line servitude; and • Implement rehabilitation of disturbed areas as soon as possible to limit the duration of exposed surfaces. • Minimise unsightly cut- and fill areas by stepping the substation building platform and thereby lowering the structure by as much as possible; • Shape the cut and fill embankments by rounding the edges and giving it a more natural appearance if space permits. Alternatively, embankments must be stabilised preferably through planting (unlikely to be an option inside the substation boundary fence due to safety consideration) to cover up any exposed soil and to restrict erosion; • Establish screening planting along the sides of the substations that front towards the communities. Alternatively it should be relocated to a site that has a natural screening capacity; • Signage should be simple and unobtrusive and not protrude above the skyline when • viewed from any direction; and • A definite effort should be made to reduce the height and scale of the substations • As little clearing of the servitude is done. Leaving a large percentage of low growing shrubs in the servitude will reduce the conspicuousness of the corridor as the colour and vegetation patterns will remain fairly intact. • Aligning the power line with the existing roads will also minimise further bush clearing.	

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
Geotechnical Impacts ***The desk top study did not show significant differences in geotechnical conditions for the alternatives but detail investigations of pylon positions need to be undertaken once a route has been approved.***	***Direct impacts:*** Soil disturbance during construction at the pylon sites which may destabilise the soil and lead to soil erosion	High	• Use of berms and drainage channels to direct water away from the construction areas where necessary • Use existing access roads wherever possible • Rehabilitate disturbed areas as soon as possible after construction • Correct engineering design of stream and water course crossings • Correct engineering design of any new access roads	**Medium -low**
	The possible presence of shallow rock (granite, granophyre & gabbro) or hardpan calcrete (within 1,5m of surface) could result in areas of difficult excavation, NHBRC class R.	Medium	• Steep slopes (>45°) and areas immediately below them should be avoided for the siting of pylons and maintenance roads wherever possible. These areas are subject to slope failure and are vulnerable to erosion.	**Low**
	Shallow perched water table could saturate foundation soils and have a detrimental effect on bearing capacity at the substation sites.	Medium	• Floodplains and areas in close proximity to rivers need to be avoided. • No pylons should be placed in or close to pans, vlei areas and wetlands.	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: *None identified*	N/A	N/A	**N/A**
Dust Impacts ***The dust impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments***	***Direct impacts:*** Construction machinery and heavy vehicles which are likely to make use of the existing local roads to transport equipment and material to the construction site, are likely to generate dust. However, the proposed power line is located away from	Low	• Continuous watering of the site should be carried out to prevent dust pollution during windy and dry conditions. • A continuous dust monitoring process needs to be undertaken during construction. • Speed restriction of 20km/h must be implemented for all construction vehicles. • All vehicles transporting friable materials such a sand, rubble etc must be covered by a tarpaulin or wet down. • Construction work to be undertaken during weekdays as far as	**Low**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
(relatively far away from residential areas)	residential areas and only a low nuisance factor is expected.		practical.	
	Indirect impacts: None identified.	N/A	N/A	**N/A**
	Cumulative impacts: None identified.	N/A	N/A	**N/A**
Spillage of hazardous substances ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives***	***Direct impacts*** Several activities can cause the spillage of hazardous substances, causing contamination of receiving environment at the construction site. These include spillages from unmanaged ablution facilities, spillages of fuels and oils, spillage of concrete and cement and runoff of contaminated cement wastewater.	Medium	*Store fuels and chemicals in a bunded area. Provide staff with hazardous materials training.*	**Low**
	Indirect impacts None identified	N/A	N/A	**N/A**
	Cumulative impacts None identified	N/A	N/A	**N/A**
Fires ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives***	***Direct impacts*** Fires may be caused through a number of actions or reasons, such as defective equipment, cigarette butts, and spilled fuels and oils. Fires are generally the result of bad or ineffective management, or negligence.	Medium	Fire fighting equipment to be kept on site and serviced regularly.	**Low**
	Indirect impacts None identified	N/A	N/A	**N/A**
	Cumulative impacts	N/A	N/A	**N/A**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
	None identified			
Impact on socio-economics ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives due to similar socio-ecomomic situation for all these locations.***	***Direct impacts:*** Impact on nearby residential areas - Influx of workers in the area may raise concerns from neighbouring residents	Medium	• All adjacent landowners must be informed of the construction processes prior to commencement of construction activities. • Adjacent land owners must be informed timeously of any service stoppages in their areas. • Notification must include possible timeframes for stoppages. • Consequences of such stoppages must be clearly indicated to all surrounding/affected land owners. • Affected land owners must be timeously informed of any/all maintenance of the bulk water services supply which may result in service stoppages to their properties. Again this must include possible timeframes so alternatives can be provided.	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Impacts on traffic and local roads ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives***	***Direct impacts:*** Traffic could be congested as a result of construction activities. In addition, traffic increase can lead to road damage, erosion, accidents and even traffic delays Construction machinery and heavy vehicles are likely to generate dust which is likely to be perceptible by adjacent residents. Trucks may potentially distribute dust along internal access roads.		• Vehicular movement beyond the property boundaries may not occur during peak hour traffic times (07h30 – 08h30 and 16h00 – 17h00). • It must be ensured that a backlog of traffic does not develop at the access points during peak hours through the upgrade to the road system and the implementation of an efficient and effective access control system. • Speed restriction of 20km/h must be implemented for all construction vehicles. • Implement dust suppression measures (wetting or application of soil binding compound) in all areas that will be affected by construction • activities and where dust will be generated	**low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
	Indirect impacts: Indirect employment through demand for construction materials, and support services, as well as empowerment and skills transfer opportunities.	Medium	No mitigation measure required (positive impact)	**Medium Positive impact**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Impact on infrastructure services	***Direct impacts:*** The status of the infrastructure services may be impacted on through the establishment of the site and the construction of roads.		**There are no mitigation measures as the impact is positive.** • The status of the infrastructure services in the surrounding area will be improved through the establishment of the site and the upgrade of roads in the area. • Insect the site for burst, blocked or leaking water pipe • During the operational phase, the sewage system must be inspected for leakages on regular basis and any leakages must be attended to immediately.	**Medium Positive Impact**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Increased soil erosion ***The impacts would be similar for Alt 1 Alt 2 alternatives but more pronounced for Alternative 3 where erosion dongas have already formed.***	Loss of fertile topsoil will occur due to the initial vegetation clearing (for access roads to tower sites); and construction earthworks may cause increased soil erosion as well as stormwater runoff.		• The route deviations impacting mostly on disturbed areas should be considered • It is recommended that care should be taken when constructing a power line as this might result in soil erosion. If at all possible, construction activities should preferably take place during the dry winter months. • Stockpiles in excavated areas should not be higher than 2 m to avoid compaction and visual impacts. • To prevent erosion of materials stockpiled for a long period of time, the material must be retained in a bermed area. • Do not allow erosion to develop on a large scale before taking action. • Make use of existing roads and tracks where feasible, rather than	**Medium**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			creating new routes through grassland areas. • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005). • Runoff from roads must be managed to avoid erosion and pollution problems. • Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. The grassland can be removed as sods and re-established after construction is completed. • Colonisation of the disturbed areas by plants species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study area. • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.	

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
Health and safety impacts ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments***	***Direct impacts:*** Impacts/injuries to animals or humans entering the site unnoticed	Medium	• The construction site and tower excavations must be fenced off and demarcated using danger tape to ensure that no animals or residents enter the area. • No fires are allowed at or around the construction site. • The contractor must provide gas fired stoves and heaters to the workers • Due to the reason that the number of population in the receiving environment will increase, it is therefore important to develop and implement Health Awareness programs to reduce the wide spread of diseases such as HIV/AIDS as well as educating people on issues related to safe sex. • Since the majority of the households in the area lack formal basic infrastructures for sanitation (flush toilets), it will also be advisable to provide mobile toilets to avoid contamination of land and surface water (e.g. rivers, springs and wetlands), as well as providing safe drinking water to reduce the consumption of contaminated water from streams/rivers or boreholes.	**Low**
	Workforce and construction sites	Medium	• Ensure all construction vehicles and machinery is under the control of competent personnel. • Limit access to the construction site to the workforce only. • Safety clothes and equipment must be worn at all times. • Comply with the requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Waste Management impacts ***The impacts would be similar for Alt 1 Alt 2 and Alt3***	***Direct impacts:*** Improper storage and disposal of solid waste, littering and ablution facilities	Medium	• All solid waste generated during the construction process must be placed in a designated waste collection area within the construction camp and must not be allowed to blow around the site, be accessible to animals, or be placed in piles adjacent the waste skips / bins. • All solid waste must then be disposed of at the nearest licensed	**Low**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
alternatives due to similar environments			landfill and safe disposal certificates obtained. • Separate waste skips/ bins for the different waste streams must be available on site. The waste containers must be appropriate to the waste type contained therein and where necessary should be lined and covered. This will be managed through the site specific EMPr and monitored by the ECO. • Littering will not be permitted on the site and general housekeeping will be enforced. • General waste bins must be readily available for litter disposal and general housekeeping. The EMPr must be followed during construction. • All excess material and rubble must be removed from the site so not to restrict the rehabilitation process. • Adequate toilet facilities must be provided for all staff members as standard construction practice. • Chemical toilets must be placed within the construction camp and not in close proximity to the river. The chemical toilets to be provided must be from a registered company and all sewage must be disposed of at an appropriate facility. Safe disposal certificates must be kept on record. • No wastes may remain on the construction site for more than two weeks • Keep the properties neat and litter free at all times and maintain the landscaped areas.	
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Impacts on ground water ***The impacts would be similar for Alt 1***	***Direct impacts:*** Groundwater contamination - Hydrocarbon leakages from plant vehicles and poor management of sources of	Medium	• Construction vehicles are to be maintained in good working order, to reduce the probability of leakage of fuels and lubricants. • All cement mixing must occur on impervious surfaces and within controlled bermed areas. • Oil residue must be treated with oil absorbent such as Drizit or	**Low**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
Alt 2 and Alt3 alternatives due to similar environments	hydrocarbon leakages has a potential to pollute underground and surrounding resources		similar and this material removed to a licensed waste disposal site. • Contractor/s must provide regularly serviced portable chemical toilets for construction workers at a distance no more than 200 m from the place of construction. • No materials may be discharged from the construction camps.	
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Noise Impacts ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments, and location away from residential areas***	***Direct impacts:*** Vehicles transporting materials to and from the site will potentially cause an additional noise burden to adjacent residents as well as along internal access roads.	Medium	• The contractor must ensure that noise levels remain within acceptable limits • Construction activities must be limited to normal working hours and according to municipal bylaws, i.e. working hours must be limited to weekdays as far as possible. • If construction is required on the weekend; permission from adjacent landowners will be required prior to construction.	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Impacts on stormwater ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments and conditions.***	***Direct impacts:*** The accumulation of stormwater.	Medium	• No stockpiles or construction materials may be stored or placed within any drainage line that may be in close proximity of storm water drains. • No stockpiles or construction materials may be stored or placed in close proximity to storm water drains. • The storm water system especially discharge points must be inspected and damaged areas must be repaired if required.	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**

OPERATIONAL PHASE IMPACTS				
PROPOSED KGABALATSANE POWER LINE ROUTES (PREFERRED AND ALTERNATIVES)				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation:**
Impacts on Flora ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives because the floral environments are similar.***	***Direct impacts:*** *Positive* impact by removing alien invasive plants, although care must be taken not to remove all vegetation at once, especially within the rainy season (could result in soil erosion and soil loss).	Medium	• Rehabilitate all areas cleared of invasive plants as soon as practically possible, utilising specified methods and species. • Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge. Monitoring should continue for at least two years after construction is complete. • Follow manufacturer's instruction when using chemical methods, especially in terms of quantities, time of application etc. • Ensure that only properly trained people handle and make use of chemicals. • Dispose of the eradicated plant material at an approved solid waste disposal site. • Only indigenous plant species naturally occurring in the area should be used during the rehabilitation of the areas affected by the construction activities.	**Low**
	Destruction of natural vegetation	Medium	• After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction. • Ensure that maintenance work does not take place haphazardly, but according to a fixed plan. • Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. • Delay the re-introduction of livestock (where applicable) to all rehabilitation areas until an acceptable level of re-vegetation has been reached. • Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should	**Low**

OPERATIONAL PHASE IMPACTS				
PROPOSED KGABALATSANE POWER LINE ROUTES (PREFERRED AND ALTERNATIVES)				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation:**
			be adhered to. • Plants that are not interfering with the operation of the powerline during the maintenance must not be disturbed.	
	Indirect impacts: Bush encroachment	Medium	• Use grass sods that were removed prior to construction to rehabilitate the construction footprints. Sods must not be stored for lengthy periods and should not be stacked on top of each other or on top of grazed and moist grasslands. The sods should preferably be removed during the winter months and replanted by springtime latest. • Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. • Delay the re-introduction of livestock (where applicable) to all rehabilitation areas until an acceptable level of re-vegetation has been reached. • Remove excess *Acacia karoo*, *A melifera* and *Dichrostachys cinerea* seedlings along with any alien vegetation. • Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.	**Low**
	Cumulative impacts:	N/A	N/A	**N/A**
Disruption to local residents ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives***	***Direct impacts:*** Power cuts during maintenance may disrupt local people	Medium	Inform residents if planned power cuts at least 15 -30 days before implementing	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**

OPERATIONAL PHASE IMPACTS				
PROPOSED KGABALATSANE POWER LINE ROUTES (PREFERRED AND ALTERNATIVES)				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation:**
Impacts on Fauna ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives***	***Direct impacts:*** Faunal Disturbance - During the operational phase the mammal assemblages will be minimally disturbed by the functioning of the powerline and occasionally disturbed should maintenance of the infrastructure be required. It is not expected for the composition of fauna species to alter and the distribution and abundance of the faunal species should revert to that similar of the composition before construction. This impact will be on a limited basis dependent on the need for maintenance.	Medium	• Areas not impacted by the associated infrastructure, as well as those considered to have a high biological diversity, should be maintained in their present states; • Maintenance activities should be limited to daylight hours and vehicles should remain on the designated roads at all times; and • The road network should be maintained as gravel tracks that allow for faunal dispersal.	**Low**
	Indirect impacts: Local Business growth	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Impacts on Socioeconomic ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives***	***Direct impacts:*** Job creation during maintenance	Low	• Jobs will be available to skilled workers and not many local job seekers will benefit from the maintenance works. • preference could be given to local SMMEs where possible for tasks such as Clearing of vegetation	**Low** **Positive Impact**
	Indirect impacts: Local Business growth	Medium	No mitigation measures are recommended.	**Medium** **Positive impact**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Visual Impacts	***Direct Impacts:*** **Aesthetic quality and sense of place:** The operation of the new power line and	Low in areas without residential component	• Previously rehabilitated areas must be monitored to prevent the infestation of weeds that may become an unsightly feature. • Maintenance of the servitude in terms of clearing up littering and	**Medium**

OPERATIONAL PHASE IMPACTS				
PROPOSED KGABALATSANE POWER LINE ROUTES (PREFERRED AND ALTERNATIVES)				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation:**
	substations will cause intrusions on observers' views especially on those residents living within 1 km of the servitude. This will result from the introduction of new elements that are uncharacteristic of the study area and will alter the baseline condition to the visual environment. The industrial character of the power lines and substation will contrast severely with the rural and natural character of the landscape. These will be representative of anthropogenic alternations to a study area that is expected to impact on the value of the visual environment.	High when close to residential areas	dumped refuse is highly recommended. This must be done on a routine basis in order to keep the servitude neat and maintain a visually unobtrusive condition; • All lighting, especially perimeter security lighting at the substations must be shielded to minimise light spillage and pollution. No direct light sources must be seen from outside the site; • Previously rehabilitated areas must be monitored to prevent the infestation of alien vegetation species that may become an unsightly feature; and • Screen planting that was specifically established to minimise the intrusiveness of the power line or substation must be maintained and dead or sick plants replaced for a determinate period after construction.	
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Soil erosion ***The impacts would be similar for Alt 1 Alt 2 but more pronounced for the Alternatives 3 thata is located in an area where erosion dongas already exists***	***Direct impacts:*** **Storm water runoff may cause soil erosion from the tower foundations**	Medium	• Regularly inspect all storm water channels • Provide soil conservation measures in areas of susceptible erosion around the tower foundations	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: The cumulative impact would be an increase in erosion and loss of topsoil. Erosion dongas will form more easily, creating areas that are dangerous to live stock and residents.	N/A	N/A	**N/A**

ASSESSMENT OF KGABALATSANE SUBSTATION (PREFERRED ALTERNATIVE 1 & ALTERNATIVE 2)

Note - For the purposes of this assessment and clarification, the proposed **SUBSTATIONS for Kgabalatsane **and alternatives** will be **assessed collectively** as these follow a similar geographical environment. Impacts from the abovementioned substations are likely to be similar.* **Notes will be made should significant differences between sites or alternatives occur, to indicate if and why a particular alternative is perceived to be less favourable**.

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
CONSTRUCTION PHASE				
Impact on Fauna	***Direct impacts:*** • Loss of faunal habitat / Fragmentation from the clearing of vegetation communities for construction of the associated powerline infrastructure and servitude • Faunal Disturbance from construction activities. i.e. noise • Killing and snaring of fauna species may occur from construction personnel ***Impacts for both alternatives regarding fauna are likely to be similar due to similar environments***	High	• Only areas where construction is to occur should be cleared of vegetation; • No natural watercourses, pans, or wetlands should be disturbed by the development with a 500m buffer zone (marked during the construction phase) allowed for between the edge of any of the above mentioned features or an appropriate buffer zone as determined by a wetland specialist; • The extent of the construction should be confined to disturbed areas or those identified as having a low / medium ecological sensitivity and demarcated. • Where areas of high ecological sensitivity need to be disturbed, the necessary permits and mitigation measures recommended by the wetland specialist should be implemented. • No construction vehicles or personnel should be allowed to leave the demarcated area unless authorised to do so • Areas identified with high ecological sensitivity should be avoided during construction activities. • Areas that are not part of the site development plan should be marked as no-go zones; • The development should promote connectivity between ecologically important habitats by retaining natural corridors for the	Medium

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			movement of fauna; • Roads should be planned to encourage faunal dispersal and minimize fragmentation of ecologically sensitive areas. Roads should preferably be maintained as gravel tracks; • Construction activities should be limited to daylight hours; and • Construction vehicles transporting materials to and from the construction site must be covered to reduce the formation of dust. • Construction personnel should be informed of the Animal Protection Act no. 71 of 1962 and encouraged not to harm any wildlife; and • Construction personnel should undergo awareness training regarding fauna assemblages and the correct procedures to follow should fauna be found within the site. They should be encouraged • not to harm any wildlife. They should also be informed of any policies and procedures applicable for fauna and the environment.	
Impacts on Avifauna **Both Alternatives** are located in the savanna biome. Hoever, the majority of species recorded during the field survey are common, widespread and typical bushveld species ***Impacts for both alternatives regarding avifauna are likely to be similar due to similar environments***	*Direct impacts:* Displacement due to habitat destruction and disturbance	Low	Restrict the construction activities to the construction footprint area. Avoid the removal of large trees.	**Low**
	Electrocutions - Raptors and vultures that may occasionally forage in the study area	Medium	The poles should be fitted with bird perches on top of the poles to draw birds, particularly vultures, away from the potentially risky insulators	**Low**
	Indirect impacts None identified	N/A	N/A	**N/A**
	Cumulative impacts None identified	N/A	N/A	**N/A**
Impacts on Flora	Proposed preferred Alternative 1	Medium	• The placing of the substation and associated structures must be	**Low**

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
The study area falls within the **Savanna Biome** and classified as belonging to the Marikana Thornveld (SVcb6)	<u>substation:</u> • The area surrounding the site comprises of secondary Bushveld with a number of current disturbances. • Vegetation is Disturbed (grazed and trampled) <u>Alternative 2 substation</u> site: • Comprised of secondary Bushveld with current disturbances. • Vegetation is largely disturbed (grazed and trampled) • No red data species were found Protected trees <u>along the Alternative 1, 2 and 3 power line routes</u> were identified: Marula (Sclerocarrya birrea), Ironwood (Combretum imberbe) and Shepherd's Tree (Boscia albitrunca) , *Faurea saligna.*		fixed in areas with the least vegetation sensitivity. • A temporary fence or demarcation must be erected around the construction area (include the servitude, construction camps, areas where material is stored and the actual footprint of the development) to prevent access to sensitive environs. • Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area. • No open fires are permitted within naturally vegetated areas. • Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas. • A vegetation rehabilitation plan should be implemented. Grass can be removed as sods and stored within transformed vegetation – remove alien invasive vegetation prior to storing grasslands sods in transformed areas. Smaller shrubs and bulbs should also be removed and used for rehabilitation. The plants must preferably be removed during the winter months and be replanted by latest springtime. The grass sods should not be stacked on top of each other. Once construction is completed, these sods should be used to rehabilitate the disturbed areas from where they have been removed. In the absence of timely rainfall, the sods should be watered well after planting and at least twice more over the next 2 weeks. • Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority. • No activities should take place during rainy events and at least 2 days afterwards.	
	Possible destruction of plants of conservation concern and protected tree species (Both Site Alternatives) .		• Note that removal and pruning of protected species will require a permit from the Department of Agriculture, Forestry and Fisheries (DAFF). • Implement a Plant Rescue and Rehabilitation Plan: Where the plants of conservation concern are deemed to be under threat from the construction activity, the plants should be removed by a	Low

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			suitably qualified specialist and replanted as part of vegetation rehabilitation after the construction. • Construction workers may not tamper or remove these plants and neither may anyone collect seed from the plants without permission from the local authority. • Cordon off the sensitive vegetation that house the protected plant species and the plants of conservation concern and protect from construction activities and vehicles.	
	Indirect impacts: Spread of alien invasive vegetation	Medium	• Alien invasive species that were identified within the study area and in specific along the final route alignment should be removed prior to construction-related soil disturbances. • Compile and implement an alien invasive monitoring plan to remove alien invasive plant species along the chosen route alignments, prior to construction. • By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation. • All alien seedlings and saplings must be removed as they become evident for the duration of construction. • Manual / mechanical removal is preferred to chemical control. • All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the construction areas. This should be verified by the ECO.	Low
	Cumulative impacts None identified	N/A	N/A	N/A
	Cumulative impacts: *– no wetlands were identified on the sites* ***for either Alternative 1 or 2***	N/A	N/A	N/A

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
Impacts on Heritage Resources	***Direct impacts:*** **Impacts on graves** – No graves were found **on** either **Alternative 1 or Alternative 2 substation sites.**	None	None	**None**
	Homesteads - none are located **on** Alternative **1 or Alternative 2 substation sites**	None	None	**None**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Visual Impacts ***Visual Impacts for both alternatives are likely to be similar due to similar environments (away from residential areas)***	***Direct impacts:*** Both sites • Removal of vegetation from construction activities • Construction of new access road • Construction of camps and work force All these activities will impact on the visual value and quality of the landscape character especially in the areas that are considered natural. **Alternative 2** site for the Kgabalatsane Substation is the least preferred option mainly due to its loop-in and loop-out power lines traversing one of the highest points in the study area and its proximity to the Kgabalatsane settlement. Visibility of the power lines and the	Medium	• Locate construction camps and stock yards in the least visible areas or locate it on areas that are already disturbed such as agricultural fields for example; The screening capacity of the site can be temporarily enhanced through the erection of a 3 m high shade cloth fence around the construction camp and substation site during construction. The colour of the shade cloth should be similar to that of the adjacent vegetation, i.e. a light brown or khaki green; • Keep the construction camp and construction area neat and tidy at all times. Remove any waste products from the site or contain it in an enclosed area out of sight from viewers; • Establish limits of disturbances during construction through the demarcating of the construction areas to prevent unnecessary damage to vegetation; • Keep to existing road infrastructure as far as possible to minimise the physical damage to vegetation in the power line servitude; and • Implement rehabilitation of disturbed areas as soon as possible to limit the duration of exposed surfaces. • Minimise unsightly cut- and fill areas by stepping the substation building platform and thereby lowering the structure by as much as possible;	**Low**

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
	cleared corridor from sensitive viewpoints is considered highly probable. Its impact on the natural character of the visual resource is considered severe due to a 5 km corridor that has to be cleared. **The Alternative 1** (client's preferred option) is considered the preferred substation site. Although it is closer to a public road the vegetation screening is considered sufficient enough to screen views from the road. Access roads will also be kept at a minimum which will limit the impact on the natural character. The two proposed power line servitudes are further away from settlements which reduce the probability of visibility and intrusiveness. The client's preferred alignment is regarded the most preferred option from a visual impact opinion. Keeping the servitude close to existing linear infrastructure such as the existing road, minimises the impact on the visual resource. Motorists are the only observer group that will view the power line closely. Their impact exposure is brief and their sensitivity low making the impact severity also low.		• Shape the cut and fill embankments by rounding the edges and giving it a more natural appearance if space permits. Alternatively, embankments must be stabilised preferably through planting (unlikely to be an option inside the substation boundary fence due to safety consideration) to cover up any exposed soil and to restrict erosion; • Establish screening planting along the sides of the substations that front towards the communities. Alternatively it should be relocated to a site that has a natural screening capacity; • Signage should be simple and unobtrusive and not protrude above the skyline when viewed from any direction; and • A definite effort should be made to reduce the height and scale of the substations, if at all possible.	

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
Geotechnical Impacts	***Direct impacts: Both alternatives*** Soil disturbance during construction at substation sites which may destabilise the soil and lead to soil erosion **Similar impacts for both Alternatives**, slightly more **pronounced at Alternative 2** (dongas)	Medium	• Use of berms and drainage channels to direct water away from the construction areas where necessary • Use existing access roads wherever possible • Rehabilitate disturbed areas as soon as possible after construction • Correct engineering design of stream and water course crossings • Correct engineering design of any new access roads	Medium -low
	NHBRC class C1/s1 or C2/S2 (depends on thickness) at both sites. The possible presence of shallow rock (granite, granophyre & gabbro) or hardpan calcrete (within 1,5m of surface) could result in areas of difficult excavation. Core stones could perhaps require blasting. Some clayey alluvium could be found NHBRC Class H to H3 – to be catered for in the design of substations (both alternatives)	Medium	• Steep slopes (>45°) and areas immediately below them should be avoided for the siting of pylons and maintenance roads wherever possible. These areas are subject to slope failure and are vulnerable to erosion.	Low
	Shallow perched water table could saturate foundation soils and have a detrimental effect on bearing capacity at the substation sites. Ground water pollution is a potential threat.	Medium	• Floodplains and areas in close proximity to rivers need to be avoided. • No infrastructure should be placed in or close to pans, vleis and wetlands.	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts:	N/A	N/A	**N/A**

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
	None identified			
Dust Impacts ***similar for both alternatives due to similar environments***	***Direct impacts:*** Construction machinery and heavy vehicles which are likely to make use of the existing farm roads to transport equipment and material to the construction site, are likely to generate dust which is likely to be perceptible by adjacent residents. Trucks may potentially distribute dust along access roads	Low	• Continuous watering of the site should be carried out to prevent dust pollution during windy and dry conditions. • A continuous dust monitoring process needs to be undertaken during construction. • Speed restriction of 20km/h must be implemented for all construction vehicles. • All vehicles transporting friable materials such a sand, rubble etc must be covered by a tarpaulin or wet down. • Construction work to be undertaken during weekdays as far as practical.	**Low**
	Indirect impacts: None identified.	N/A	N/A	**N/A**
	Cumulative impacts: None identified.	N/A	N/A	**N/A**
Spillage of hazardous substances ***similar for both alternatives due to similar environments***	***Direct impacts*** Several activities can cause the spillage of hazardous substances, causing contamination of receiving environment at the construction site. These include spillages from unmanaged ablution facilities, spillages of fuels and oils, spillage of concrete and cement and runoff of contaminated cement wastewater.	Medium	*Store fuels and chemicals in a bunded area. Provide staff with hazardous materials training.*	**Low**
	Indirect impacts None identified	N/A	N/A	**N/A**
	Cumulative impacts None identified	N/A	N/A	**N/A**
Fires ***similar for both***	***Direct impacts*** Fires may be caused through a number of actions or reasons, such	Medium	Fire fighting equipment to be kept on site and serviced regularly.	**Low**

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
alternatives due to similar environments	as defective equipment, cigarette butts, and spilled fuels and oils. Fires are generally the result of bad or ineffective management, or negligence.			
	Indirect impacts None identified	N/A	N/A	**N/A**
	Cumulative impacts None identified	N/A	N/A	**N/A**
Impact on socio-economics ***similar for both alternatives due to similar environments and distances away from residential areas***	***Direct impacts:*** Impact on closest residential areas - Influx of workers in the area may raise concerns from neighbouring residents, however the substations are not located in close proximity to the actual homesteads	Medium	• All adjacent landowners must be informed of the construction processes prior to commencement of construction activities. • Adjacent land owners must be informed timeously of any service stoppages in their areas. • Notification must include possible timeframes for stoppages. • Consequences of such stoppages must be clearly indicated to all surrounding/affected land owners. • Affected land owners must be timeously informed of any/all maintenance of the bulk water services supply which may result in service stoppages to their properties. Again this must include possible timeframes so alternatives can be provided.	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Impacts on traffic and local roads ***similar for both alternatives due to similar environments, and rural character of the study area***	***Direct impacts:*** Traffic will be congested as a result of construction activities. In addition, traffic increase can lead to road damage, erosion, accidents and even traffic delays Construction machinery and heavy vehicles are likely to generate dust which is likely to be perceptible by adjacent residents. Trucks may		• Vehicular movement beyond the property boundaries may not occur during peak hour traffic times (07h30 – 08h30 and 16h00 – 17h00). • It must be ensured that a backlog of traffic does not develop at the access points during peak hours through the upgrade to the road system and the implementation of an efficient and effective access control system. • Speed restriction of 20km/h must be implemented for all construction vehicles.	

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
	potentially distribute dust along internal access roads.		• Implement dust suppression measures (wetting or application of soil binding compound) in all areas that will be affected by construction • activities and where dust will be generated	
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A
Impact on socio-economics: ***similar for both alternatives due to similar social environments***	***Direct impacts:*** Economic and employment status will be impacted on due to access and road construction, building construction, paving construction, site clearance and landscaping.	Low	The construction phase will provide (limited) direct temporary employment for locals, and • Local communities should be informed upfront and in no uncertain terms that the possibility of local employment is most unlikely so that unrealistic expectations are not created • Where unskilled labour is required, it should be sourced from the local communities • Where project activities lead to the creation of informal job opportunities such as food stalls, contractors should be encouraged to allow such activities	**Medium Positive Impact**
	Indirect impacts: Indirect employment through demand for construction materials, and support services, as well as empowerment and skills transfer opportunities.	Low	No mitigation measure required	**Low-Medium Positive Impact**
	Cumulative impacts: None identified	N/A	N/A	N/A
Impact on infrastructure services ***similar for both alternatives due to similar rural***	***Direct impacts:*** The status of the infrastructure services may be impacted on through the establishment of the site and the construction of roads.	**Medium Positive Impact**	• The status of the infrastructure services in the surrounding area will be improved through the establishment of the site and the upgrade of roads in the area. • Inspect the site for burst, blocked or leaking water pipes • During the operational phase of the substation, the sewage system must be inspected for leakages on regular basis and any leakages must be attended to immediately.	**High Positive Impact**

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
environments, positive impact the same for both options	***Indirect impacts:*** None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Increased soil erosion ***similar for both alternatives but more pronounced at Alternative 2 site that is located close to erosion dongas and seasonal stream***	Loss of fertile topsoil will occur due to the initial vegetation clearing (for access roads and on the site of the substation); and construction earthworks may cause increased soil erosion as well as stormwater runoff.	Medium	• If at all possible, construction activities should preferably take place during the dry winter months. • Stockpiles in excavated areas should not be higher than 2 m to avoid compaction and visual impacts. • To prevent erosion of materials stockpiled for a long period of time, the material must be retained in a bermed area. • Do not allow erosion to develop on a large scale before taking action. • Make use of existing roads and tracks where feasible, rather than creating new routes through grassland areas. • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005). • Runoff from roads must be managed to avoid erosion and pollution problems. • Remove only the vegetation where essential for construction of teh substation and do not allow any disturbance to the adjoining natural vegetation cover. The grassland can be removed as sods and re-established after construction is completed. • Colonisation of the disturbed areas by plants species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study area. • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.	**Low**

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
Health and safety impacts ***similar for both alternatives due to similar rural environments***	***Direct impacts:*** Impacts/injuries to animals or humans entering the site unnoticed	Medium	• The construction camp and substation site and any excavations must be fenced off and demarcated using danger tape to ensure that no animals or residents enter the area. • No fires are allowed at or around the construction site. • The contractor must provide gas fired stoves and heaters to the workers • Implement Health Awareness programs to reduce the wide spread of diseases such as HIV/AIDS as well as educating workers on issues related to safe sex. • Provide mobile toilets, avoid contamination of land and surface water (e.g. rivers, springs and wetlands), and provide safe drinking water to reduce the consumption of contaminated water from streams/rivers or boreholes.	Low
	Workforce and construction sites	Medium	• Ensure all construction vehicles and machinery are under the control of competent personnel. • Limit access to the construction site to the workforce only. • Safety clothes and equipment must be worn at all times. • Comply with the requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).	Low
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A
Waste Management impacts ***similar for both alternatives due to similar environments***	***Direct impacts:*** Improper storage and disposal of solid waste, littering and ablution facilities	Medium	• All solid waste generated during the construction process at the substation must be placed in a designated waste collection area within the construction camp and must not be allowed to blow around the site, be accessible to animals, or be placed in piles adjacent the waste skips / bins. • All solid waste must then be disposed of at the nearest licensed landfill and safe disposal certificates obtained. • Separate waste skips/ bins for the different waste streams must be available on site. The waste containers must be appropriate to the waste type contained therein and where necessary should be lined	Low

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			and covered. This will be managed through the site specific EMPr and monitored by the ECO. • Littering will not be permitted on the site and general housekeeping will be enforced. • General waste bins must be readily available for litter disposal and general housekeeping. The EMPr must be followed during construction of the substation • All excess material and rubble must be removed from the site so not to restrict the rehabilitation process. • Adequate toilet facilities must be provided for all staff members as standard construction practice. • Chemical toilets must be placed within the construction camp and not in close proximity to any river. The chemical toilets to be provided must be from a registered company and all sewage must be disposed of at an appropriate facility. Safe disposal certificates must be kept on record. • No wastes may remain on the construction site for more than two weeks • Keep the properties neat and litter free at all times and maintain the landscaped areas.	
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A
Impacts on ground water ***similar for both alternatives due to similar environments***	***Direct impacts:*** Groundwater contamination - Hydrocarbon leakages from plant vehicles and poor management of sources of hydrocarbon leakages has a potential to pollute underground and surrounding resources	Medium	• Construction vehicles are to be maintained in good working order, to reduce the probability of leakage of fuels and lubricants. • All cement mixing must occur on impervious surfaces and within controlled bermed areas. • Oil residue must be treated with oil absorbent such as Drizit or similar and this material removed to a licensed waste disposal site. • Contractor/s must provide regularly serviced portable chemical toilets for construction workers at a distance no more than 200 m from the place of construction.	Low

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			• No materials may be discharged from the construction camps.	
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A
Noise Impacts ***similar for both alternatives as both proposed site alternatives are located away from the towns, out in the open field***	***Direct impacts:*** Vehicles transporting materials to and from the site will potentially cause an additional noise burden to residents as well as along internal access roads.	Medium	• The contractor must ensure that noise levels remain within acceptable limits • Construction activities must be limited to normal working hours and according to municipal bylaws, i.e. working hours must be limited to weekdays as far as possible. • If construction is required on the weekend; permission from adjacent landowners will be required prior to construction.	Vey Low
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A
Impacts on stormwater ***similar for both alternatives***	***Direct impacts:*** The accumulation of stormwater.	Medium	• No stockpiles or construction materials may be stored or placed within any drainage line that may be in close proximity of storm water drains. • No stockpiles or construction materials may be stored or placed in close proximity to storm water drains. • The storm water system especially discharge points must be inspected and damaged areas must be repaired if required.	Low
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
OPERATIONAL PHASE IMPACTS				
Impacts on Flora ***Impacts for both alternatives regarding fauna are likely to be similar due to similar Floral environments***	***Direct impacts:*** *Positive* impact by removing alien invasive plants, although care must be taken not to remove all vegetation at once, especially within the rainy season (could result in soil erosion and soil loss).	Medium	• Rehabilitate all areas cleared of invasive plants as soon as practically possible, utilising specified methods and species. • Dispose of the eradicated plant material at an approved solid waste disposal site. • Only indigenous plant species naturally occurring in the area should be used during the rehabilitation of the areas affected by the construction activities.	Low
	Destruction of natural vegetation	Medium	• After construction of the substation, the land must be cleared of rubbish, surplus materials, and equipment. • Ensure that maintenance work does not take place haphazardly, but according to a fixed plan. • Maintenance workers may not trample natural vegetation surrounding the substation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.	Low
	Indirect impacts: Bush encroachment	Medium	• Use grass sods that were removed prior to construction to rehabilitate the construction footprints (e.g. the construction camp area). • Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint of the substation. In addition, mitigation measures as set out for the construction phase should be adhered to.	Low
	Cumulative impacts:	N/A	N/A	N/A
Disruption to local residents ***Impacts for both alternatives regarding fauna are likely to be similar due to similar environments***	***Direct impacts:*** Power cuts during maintenance may disrupt local people	Medium	Inform residents if planned power cuts at least 15 -30 days before implementing	Low
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A
Impacts on Fauna	***Direct impacts:***	Medium	• Maintenance activities should be limited to daylight hours and	Low

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Impacts for both alternatives regarding fauna are likely to be similar due to similar faunal environments (disturbed area, overgrazed)	Faunal Disturbance - During the operational phase fauna of the area surrounding the substation site will be minimally disturbed (occasionally during maintenance of the infrastructure) This impact will be on a limited basis dependent on the need for maintenance.		vehicles should remain on the designated roads at all times	
	Indirect impacts: none	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A
Impacts on Socioeconomic ***Impacts for both alternatives regarding are likely to be similar due to similar socio-economic conditions***	***Direct impacts:***	N/A	N/A	N/A
	Indirect impacts: Local Business growth (as result of network improvements)	low	none	low
	Cumulative impacts: None identified	N/A	N/A	N/A
Visual Impacts ***Impacts for both alternatives regarding fauna are likely to be similar rural area away from residential areas***	***Direct Impacts:*** **Aesthetic quality and sense of place:** The substation will cause intrusions on observers' views especially on those residents who may decide to reside within 1 km of the substation (future planning of developments should keep this in mind). This will result from the introduction of new elements that are uncharacteristic of the study area and will alter the baseline condition to the visual environment. The "industrial character" of the substation will contrast severely with the rural and natural character of the landscape. These will	Low to High Depending on the distance from the substation and screening of vegetation.	• All lighting, especially perimeter security lighting at the substation must be shielded to minimise light spillage and pollution. No direct light sources must be seen from outside the site; • Screen planting that was specifically established to minimise the intrusiveness of the substation must be maintained and dead or sick plants replaced for a determinate period after construction.	Medium

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
	be representative of anthropogenic alternations to a study area that is expected to impact on the value of the visual environment.			
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A
Soil erosion ***Impacts Alternative 2 would be more pronounced, due to the location of the substation in the vicinity of a seasonal water course and erosion dongas.***	***Direct impacts:*** Storm water runoff from the substation surface may cause soil erosion of adjacent areas	Medium	• Regularly inspect all storm water channels • Provide soil conservation measures in areas of susceptible erosion around the substation	Low
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A

A complete impact assessment in terms of Regulation 22(2)(i) of GN R.543 must be included as Appendix F.

2. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Summary of specialist findings for the respective power line Alternatives at Kgabalatsane

(1= Minimal impacts, 2= Low to Medium Impacts, 3= Medium to High impacts)

KGABALATSANE POWER LINE ALTERNATIVES RANKING

AREA OF IMPACT	ALTERNATIVE 1 power line (Red route)	ALTERNATIVE 2 power line (Blue route)	ALTERNATIVE 3 power line (Green route)
VEGETATION	1	1	1 Protected species found at donga
FAUNAL	1	1	1
AVI FAUNA	1	2 Line to cross streams (water birds)	2 Line to cross streams
WETLANDS & WATER COURSES	1	2 Line to cross seasonal drainage line	2 Line to cross seasonal drainage lines & donga
HERITAGE	1	2 Cemeteries in area	2 Stone tools found
VISUAL	1	1	2 Line to cross M20
GEOTECHNICAL SUITABILITY	1	1	1-2
TOTAL SCORE (LOWEST = BEST)	7	10	11

1= No or Minimal impacts 2= Low to Medium Impacts 3= Medium to High impacts

Summary of specialist findings for the two Substation Alternatives at Kgabalatsane

(1= No to Minimal impacts, 2= Low to Medium Impacts, 3= Medium to High impacts)

KGABALATSANE SUBSTATION ALTERNATIVES RANKING

AREA OF IMPACT	ALTERNATIVE 1 (Red)	ALTERNATIVE 2 (Blue)
VEGETATION	1	1 SS near drainage line
FAUNAL	1	1

AVI FAUNA	**1**	**2** SS near drainage line
WETLANDS WATER COURSES	**1**	**2** Substation near seasonal drainage line
HERITAGE	**1**	**1**
VISUAL	**2**	**2**
GEOTECHNICAL SUITABILITY	**1**	**3** Substation near donga & drainage line (clay)
TOTAL SCORE (LOWEST = BEST)	**8**	**12**

1= No or Minimal impacts **2= Low to Medium Impacts** **3= Medium to High impacts**

Kgabalatsane Power Line Alternative 1 (preferred alternative)

Based on the preceding discussion, the specialists concluded their proposed routes and alternative assessment as follows:
The ecological specialists' assessment (flora, avifaunal and wetland) concluded that the proposed Alternative 1 route (Red route) is preferred and will have the least impact on ecological systems. The vegetation in the area has been impacted on by surrounding farming (informal cattle grazing) activities, it does, in its current state, create some habitat for faunal species such as avifauna species and thus will require effective application of mitigation measures (caution not to disturb an area wider than the project footprint). The Heritage Study favoured this power line route Alternative 1, due to the fact that no cemeteries or stone age tools were found, which could be an issue for the other two Allternative routes (2 and 3). The geotechnical and faunal studies concluded that all three Alternative alignments would be equally suitable for the proposed development, although the soil conditions at Alternative 3 could be problematic due to the location close to (across) the dongas and seasonal drainage line where clayey conditions could occur.

Mitigation measures in the EMPr (Appendix F) should be strictly adhered to.

It is apparent from the specialist assessments that comparatively, the Alternative 1 route is the most feasible considering environmental and socio-economic aspects. The proposed route is considered to have least environmental impacts due to the fact that it is shorter than Alternative 3 and does not cross drainage courses (as is the case for Alternative 2 and 3). It is thus a recommendation of this BA that Proposed Alternative 1 be considered for authorisation.

Alternative 2 Kgabalatsane Power Line

The vegetation at the Alternative 2 power line route is similar to that of Alternative 1 (Marikana Thornveld), but during rainy seasons, the vegetation at the Alternative 2 (that cross a drainage line) could differ to a limited extent. During the time of the site visit, no aquatic and hygrophilous vegetation was evident at the drainage lines. Temporary pools could however lure avifauna, which make this Alternative 2 less preferred than Alternative 1.

Alternative 2 will cross low order road between Makanyaneng and Oskraal, making the Visual Impact more than Alternative 1 and thus less favoured. It was the recommendation of the Ecological specialist (fauna, flora and wetland) that proposed Alternative 1 rather be considered for the power

line route and not Alternative 2.

Alternative 3 Kgabalatsane Power Line

The vegetation at the Alternative 3 power line route is also Marikana Thornveld, but is highly disturbed. The area does not have a high conservation value from a plant ecological view, but from an ecosystem functioning perspective, the area at the Alternative 3 in particular have high conservation value. This is due to the water channelling function and retention of water in small pools for short period. Temporary pools could however lure avifauna that could create a problem regarding birds colliding with the power lines. This makes Alternative 3 route less preferred than Alternative 1 or 2.

The line is situated within an area of high erosion (donga) and a seasonal drainage course, and is thus considered less suitable in terms of geological conditions (clay). Also the Alternative 3 power line associated with this Alternative 2 substation, will cross the M20 road between Rabokala/Lerulaneng and Kgabalatsane which would be highly visible to motorists and residents. Such a Visual impact would be less acceptable than would be the case for the Alternative 2 and 1 power line routes that would transverse the lower order road(s) in the area to the north east of the M20 road (between Oskraal248 JQ and Tyne 250). Due the ecological sensitivities associated with the drainage course it was the recommendation of the Ecological specialist (fauna, flora and wetland) that proposed Alternative 1 rather be considered for the construction of the substation and not Alternative 2. The Heritage Study did not favoured power line route Alternative 3, due to the fact that stone age tools were found in close vicinity to the Alternative 3 line.

No-go alternative (compulsory)

By not constructing the Kgabalatsane power lines (and associated Substation), Eskom Distribution cannot ensure firm supply of the area. The no-go option alternative is therefore not a feasible option to consider as this would have significant negative impacts on the economy and living environment of the region, as no actual economic growth can occur, where future planned township, as well as industrial and business developments will cause overloading on the existing transmission network/system, which will result in constant power cuts. This option is therefore ruled out because it would neither supply the projected demand for electricity nor optimise the existing infrastructure.

Although the impacts identified, such as impact on wetlands, natural vegetation as well as visual impacts, would not occur if the project did not go ahead, the socio economic benefit of the proposed project should not be disregarded. The No-Go alternative has thus been eliminated due to the fact that the identified environmental impacts can be suitably mitigated and that by not building the project, the socio-economic benefits would be lost.

Kgabalatsane Sub Station Alternative 1 (preferred alternative)

From an environmental perspective, the proposed substation alternatives the Alternative 1 substation location is preferred. This substation is preferred because it is located closest to the existing Garankuwa-Dipompong-Dinaledi line that the lines will connect to. The **shorter line** (alternative 1 and Alternative 2 lines) will be less expensive and have a limited impact on the environment due to its smaller footprint. The most important aspect however, is due to the location of the Alternative 2 close to a water course on Tyne 250JQ and in the buffer zone of a seasonal wetland area.

Based on the summary of environmental observations presented, it is a conclusion of this BA that the proposed Alternative 1 will have moderate to low impacts on the bio-physical environment, all of which can be fully mitigated and managed, and where possible prevented. There will be impacts on, vegetation and associated habitats, soil, dust and noise generated by the earth moving equipment,

waste generated by the influx of contractor's and establishment of the contractor's camps. Clearing of vegetation is anticipated for the purposes of access road construction. Fencing of the construction site and the completed substation will be required to avoid impact on the surrounding natural vegetation, and prevent people and animals from entering the areas of activity.

Alternative 2 Sub Station Kgabalatsane

The vegetation at the Alternative 2 substation (which would be constructed as part of the Alternative 3 power line route that is not recommended) is situated within an area of high erosion (donga) and seasonal drainage course, and is thus considered less suitable. Also the Alternative 3 power line associated with this Alternative 2 substation, will cross the M20 road between Rabokala/Lerulaneng and Kgabalatsane which would be highly visible to motorists and residents. Such a Visual impact would be less acceptable than would be the case for the Alternative 2 and 3 power line routes that would transverse the lower order road(s) in the area to the north east of the M20 road (between Oskraal248 JQ and Tyne 250). Due the ecological sensitivities associated with the drainage course it was the recommendation of the Ecological specialist (fauna, flora and wetland) that proposed Alternative 1 rather be considered for the construction of the substation and not Alternative 2.

Alternative 2 **This substation is not preferred because it is located further away from the Dipompong line** that the lines will have to connect to than Alternative 1. The longer line will be much more expensive and have an increased impact on the environment due to its larger footprint. Also, this line is located close to a water course on Tyne 250JQ and in the buffer zone of a seasonal wetland area which is not ideal and should be avoided. In addition to this, Alternative 2 SS site would mean that Alternative 3 line route would be followed, and this line crosses over water courses and over the M20 road to the west of Kgabalatsane before joining the existing Garankuwa-Dipompong-Dinaledi line. Construction may be problematic at the crossings and may have a negative visual impact for motorists travelling on the M20.

No-go alternative (compulsory)

By not constructing the Kgabalatsane Substation (and associated power line), Eskom Distribution cannot ensure firm supply of the area. The no-go option alternative is therefore not a feasible option to consider as this would have significant negative impacts on the economy and living environment of the region, as no actual economic growth can occur, where future planned township, as well as industrial and business developments will cause overloading on the existing transmission network/system, which will result in constant power cuts. This option is therefore ruled out because it would neither supply the projected demand for electricity nor optimise the existing infrastructure.

Although the impacts identified, such as impact on wetlands, natural vegetation as well as visual impacts, would not occur if the project did not go ahead, the socio economic benefit of the proposed project should not be disregarded. The No-Go alternative has thus been eliminated due to the fact that the identified environmental impacts can be suitably mitigated and that by not building the project, the socio-economic benefits would be lost.

SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?	**YES✓**	NO

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment).

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application.

This Draft BAR has provided a comprehensive assessment of the potential environmental impacts associated with the proposed power line and substation project for Kgabalatsane. These impacts have been identified by the EIA team (including specialists) and I&APs. The key findings of the BA are discussed in this Report. In general, the proposed development will have an impact of low significance provided that there is effective application of the mitigation measures proposed in this BAR and the EMPr.

The majority of impacts can easily be mitigated and the negative impacts can be reduced to lower significance through appropriate design and mitigation measures. No impacts of unacceptably high significance are foreseen once proper mitigation measures have been implemented.

The findings of the specialists as summarised in Section 2 (Environmental Impact Statement) of this report indicate no significant fatal flaws and thus, with the application of effective mitigation measures, the proposed project is regarded to be feasible and sustainable.

Accordingly and based on the specialist assessment and various environmental assessment of the conditions, it is therefore a recommendation of this Basic Assessment that the following four (4) proposed activities and its associated infrastructure be granted a positive authorisation.

- Proposed Alternative 1 Kgabalatsane Power Line
- Proposed Alternative 1 Kgabalatsane Substation

The above mentioned powerline route and substation location have emerged as the preferred options from an environmental perspective. It is further recommended that the environmental authorities authorise the development subject to the following conditions:

- The draft EMPr and conditions thereto should be adhered to - the EMPr be made a binding document for the contractors and managers on site. (See Appendix G for the EMPr).
- Before construction, a walk–down of the power line route should be done to determine if the individual pole (pylon) structures will have an impact on any sites, features or objects of cultural heritage significance;
- Ecological (Flora and Fauna) and Heritage Resource Specialists should conduct a site visit (i.e. 'walk-down') prior to commencement of the construction phase , i.e. tower/pylon placement phase, to ensure that no flora and fauna species as well as heritage and/or cultural resources are compromised and propose relevant mitigation measures thereof;
- The North West Department of Agriculture, Conservation, Environment and Rural Development must be informed of any proposed cutting/removal of protected trees. Eskom

	should follow a positive authorisation of this BAR by doing the necessary applications (tree permits) at the Department of Forest and Fisheries (should they consider the removal of some of the protected species within the project area necessary). • No towers and access roads should be placed in any surface water resources, i.e. rivers, wetlands, etc. An authorisation from the Department of Water and Sanitation (DWS) would need to be obtained prior to construction if this is unavoidable. • The applicant must apply for a Water use Licence from the Department of Water and Sanitation in areas where water resources are impacted (streams and wetland crossing) before commencement of construction in those areas; • The Kgowe, Rosespruit and Sandspruit should be regarded as "No-Go" areas for the proposed power lines and substations, monopoles, access tracks and related activities. The 1: 100 year floodline and a 32m line from the centre of the spruit, whichever is the greatest will be regarded as "No-Go" areas. Should the applicant decide to place any structure within the wetland areas or its buffer zone or within the flood lines, a Water Use License is required from the Department of Water and Sanitation according to the Water Act. • Rehabilitation should be completed swiftly. • The location of construction camps should be carefully considered and sensitive areas be avoided. • For the substations, a due diligence contamination assessment must be done and the following parameters must be tested: PCBs, VOCs, and SVOCs • A suitability qualified Environmental Control Officer must be appointed and be present on site at all times through different phases of the project to ensure compliance with the conditions of the Environmental Authorisation and the Final Environmental Management Programme

YES ✓	**NO**

Is an EMPr attached?
The EMPr must be attached as **Appendix G.**

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix H.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix I.

Any other information relevant to this application and not previously included must be attached in Appendix J.

Marinda le Roux (EAPSA)

_____
NAME OF EAP

_____ __20 July 2015__
SIGNATURE OF EAP DATE

SECTION F: APPENDIXES

The following appendixes must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports (including terms of reference)

Appendix E: Public Participation

Appendix F: Impact Assessment

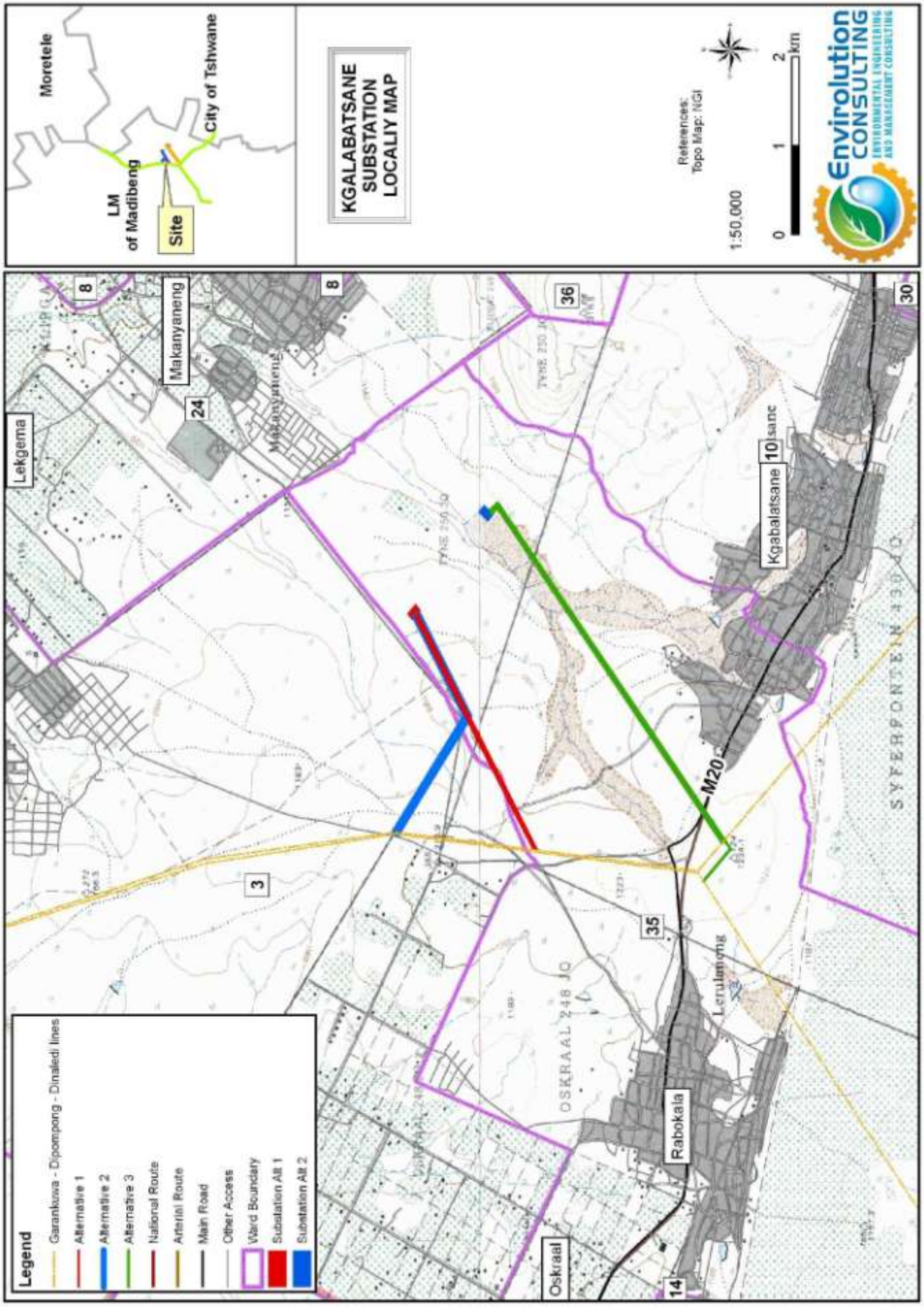
Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information

Appendix A: Locality Map


KGALABATSANE SUBSTATION LOCALIY MAP
Moretele
City of Tshwane
LM of Madibeng
Site
References:
Topo Map: NGI
1:50,000
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1
2
km
Envirolution CONSULTING
ENVIRONMENTAL ENGINEERING AND MANAGEMENT CONSULTING
Legend
Garankuwa - Dipompong - Dinaledi lines
Alternative 1
Alternative 2
Alternative 3
National Route
Arterial Route
Main Road
Other Access
Ward Boundary
Substation Alt 1
Substation Alt 2
Lekgema
Makanyaneng
Kgabalatsane
Rabokala
Oskraal
Lerulumong
M20
OSKRAAL 248 JQ
SYFERFONTEIN 430 JQ
8
24
36
10
30
3
35
14

Coordinates for linear development (every 250m)

Alternative 1 (preferred line)

LatDD	LongDD	LatDMS	LongDMS	Label
-25.49523	27.94822	25° 29' 43" S	27° 56' 54" E	
-25.49435	27.95036	25° 29' 40" S	27° 57' 1" E	Start
-25.49633	27.94605	25° 29' 47" S	27° 56' 46" E	
-25.49743	27.94388	25° 29' 51" S	27° 56' 38" E	
-25.49853	27.94171	25° 29' 55" S	27° 56' 30" E	
-25.49963	27.93954	25° 29' 59" S	27° 56' 22" E	Middle
-25.50073	27.93736	25° 30' 3" S	27° 56' 15" E	
-25.50183	27.93519	25° 30' 7" S	27° 56' 7" E	
-25.50293	27.93302	25° 30' 11" S	27° 55' 59" E	
-25.50402	27.93085	25° 30' 14" S	27° 55' 51" E	
-25.50512	27.92868	25° 30' 18" S	27° 55' 43" E	
-25.50620	27.92655	25° 30' 22" S	27° 55' 36" E	End

Alternative 2

LatDD	LongDD	LatDMS	LongDMS	Label
-25.49338	27.93031	25° 29' 36" S	27° 55' 49" E	
-25.49211	27.92825	25° 29' 32" S	27° 55' 42" E	Start
-25.49464	27.93237	25° 29' 41" S	27° 55' 57" E	
-25.49591	27.93442	25° 29' 45" S	27° 56' 4" E	
-25.49718	27.93648	25° 29' 50" S	27° 56' 11" E	
-25.49844	27.93854	25° 29' 54" S	27° 56' 19" E	
-25.49908	27.94063	25° 29' 57" S	27° 56' 26" E	Middle
-25.49798	27.94280	25° 29' 53" S	27° 56' 34" E	
-25.49688	27.94497	25° 29' 49" S	27° 56' 42" E	
-25.49578	27.94714	25° 29' 45" S	27° 56' 50" E	
-25.49468	27.94931	25° 29' 41" S	27° 56' 58" E	
-25.49422	27.95022	25° 29' 39" S	27° 57' 1" E	End

Alternative 3

LatDD	LongDD	LatDMS	LongDMS	Label
-25.52396	27.92933	25° 31' 26" S	27° 55' 46" E	
-25.52530	27.92733	25° 31' 31" S	27° 55' 38" E	Start
-25.52262	27.93133	25° 31' 21" S	27° 55' 53" E	
-25.52128	27.93333	25° 31' 17" S	27° 56' 0" E	
-25.51994	27.93533	25° 31' 12" S	27° 56' 7" E	
-25.51860	27.93733	25° 31' 7" S	27° 56' 14" E	
-25.51725	27.93933	25° 31' 2" S	27° 56' 22" E	
-25.51591	27.94133	25° 30' 57" S	27° 56' 29" E	
-25.51457	27.94333	25° 30' 52" S	27° 56' 36" E	
-25.51323	27.94532	25° 30' 48" S	27° 56' 43" E	Middle

-25.51189	27.94732	25° 30' 43" S	27° 56' 50" E	
-25.51055	27.94932	25° 30' 38" S	27° 56' 58" E	
-25.50920	27.95132	25° 30' 33" S	27° 57' 5" E	
-25.50786	27.95332	25° 30' 28" S	27° 57' 12" E	
-25.50652	27.95532	25° 30' 23" S	27° 57' 19" E	
-25.50518	27.95732	25° 30' 19" S	27° 57' 26" E	
-25.50384	27.95932	25° 30' 14" S	27° 57' 34" E	
-25.50249	27.96132	25° 30' 9" S	27° 57' 41" E	
-25.50177	27.96076	25° 30' 6" S	27° 57' 39" E	End

Coordinates for substation alternatives (corner points)

Substation Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
Northern corner point	25°29'35.68"S	27°57'1.94"E
Eastern corner point	25°29'38.01"S	27°57'4.69"E
Southern corner point	25°29'40.49"S	27°57'2.01"E
Western corner point	25°29'38.04"S	27°56'59.37"E
Substation Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
Northern corner point	25°30'2.56"S	27°57'37.80"E
Eastern corner point	25°30'4.98"S	27°57'40.63"E
Southern corner point	25°30'7.43"S	27°57'38.21"E
Western corner point	25°30'4.99"S	27°57'35.26"E

Appendix B: Photographs

Cemetery west of Alt 1 alignment

View to the east from road linking Kgalabatsane & Makanyaneng/Lekgama

Preferred site for Wesglass substation 25°34'15.41"S 27°58'15.02"E

Erosion dongas near Kgalabatsane road - M20 (25°31'7.91"S 27°55'38.90"E)

Veld condition and vegetation at Kgabalatsane (Road between Lerulaneng and Oskraal)

T-junction at the M20 road between Kgabalatsane and Rabokala

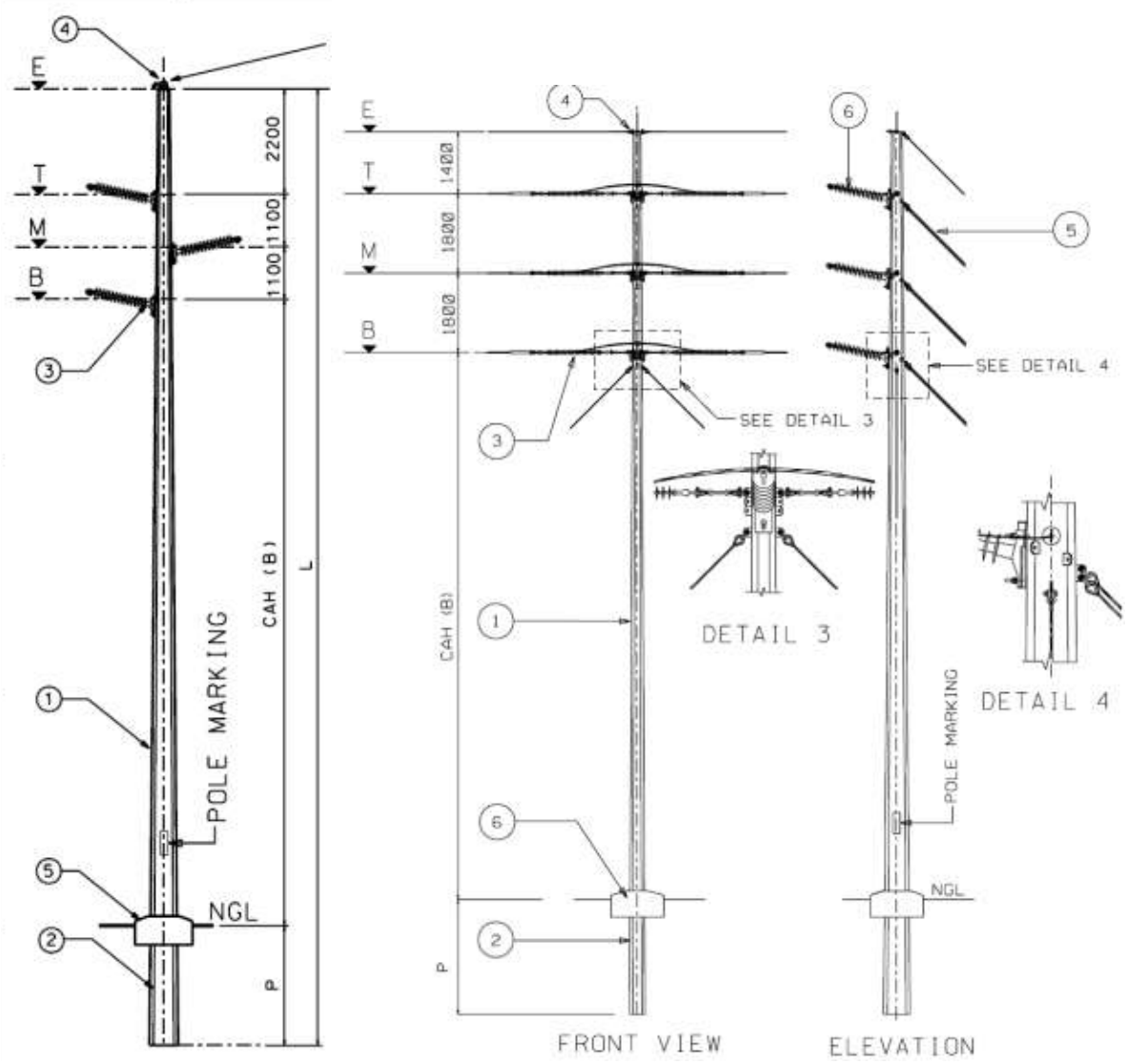
Erosion of veld north of the the M20 road between Kgabalatsane and Rabokala

Littering (illegal dumping) at the T-junction of the M20 road

Poor surface condition of the road between Rabokala and Oskraal

Appendix C: Facility illustration(s)

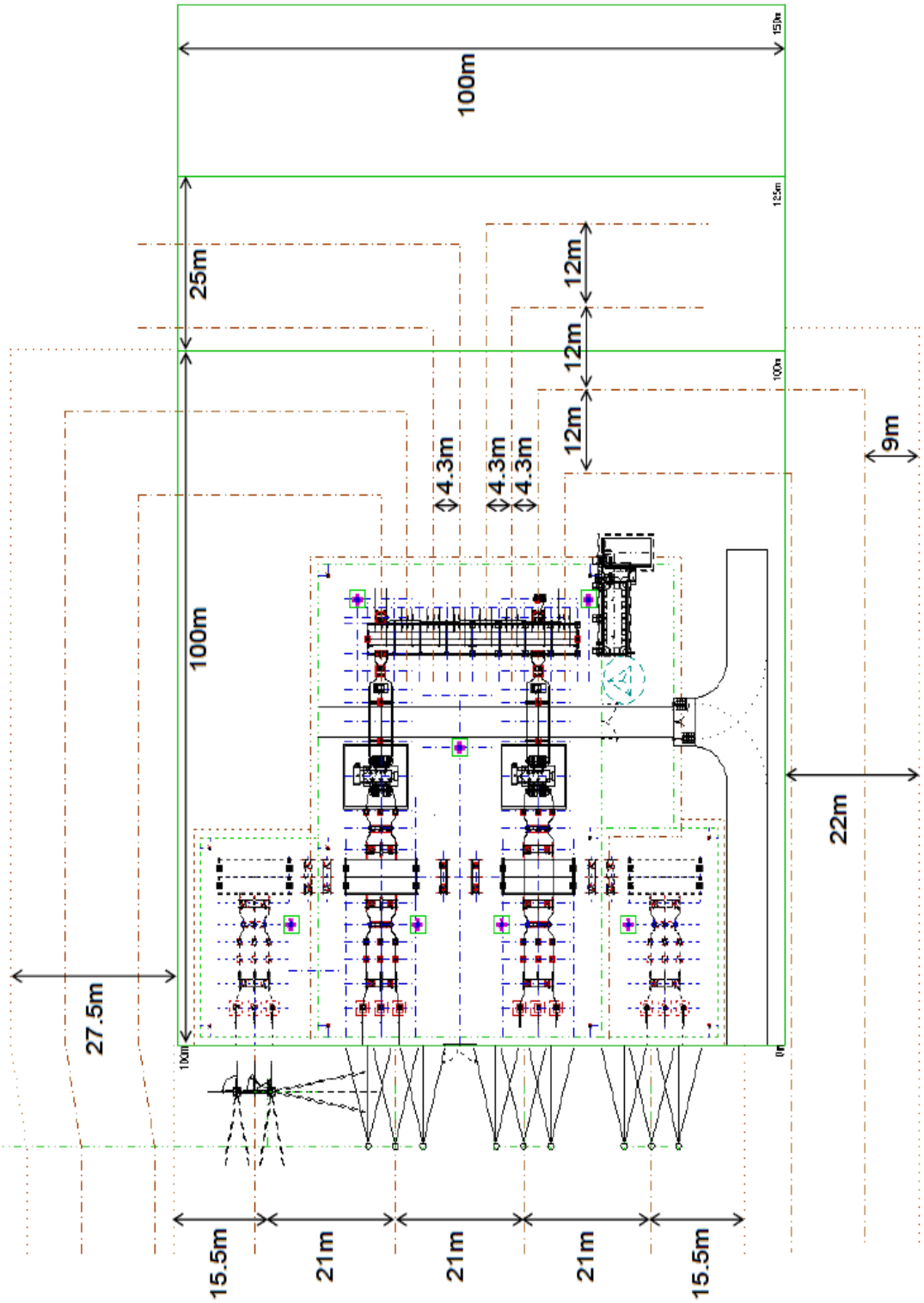
Single Circuit Monopole Structures



DESIGN REQUIREMENTS			SCHEDULE FOR CONDUCTOR ATTACHMENT HEIGHTS			
POLE LENGTH L	TIP LOAD (kN)	PLANTING DEPTH P	C A H (m AGL)			
			E	T	M	B
18	23	2.0	16.0	14.6	12.8	11.0
19	23	2.0	17.0	15.6	13.8	12.0
20	23	2.0	18.0	16.6	14.8	13.0
21	23	2.0	19.0	17.6	15.8	14.0
22	23	2.0	20.0	18.6	16.8	15.0
23	23	2.0	21.0	19.6	17.8	16.0
24	23	2.0	22.0	20.6	18.8	17.0

S

Substation site layout

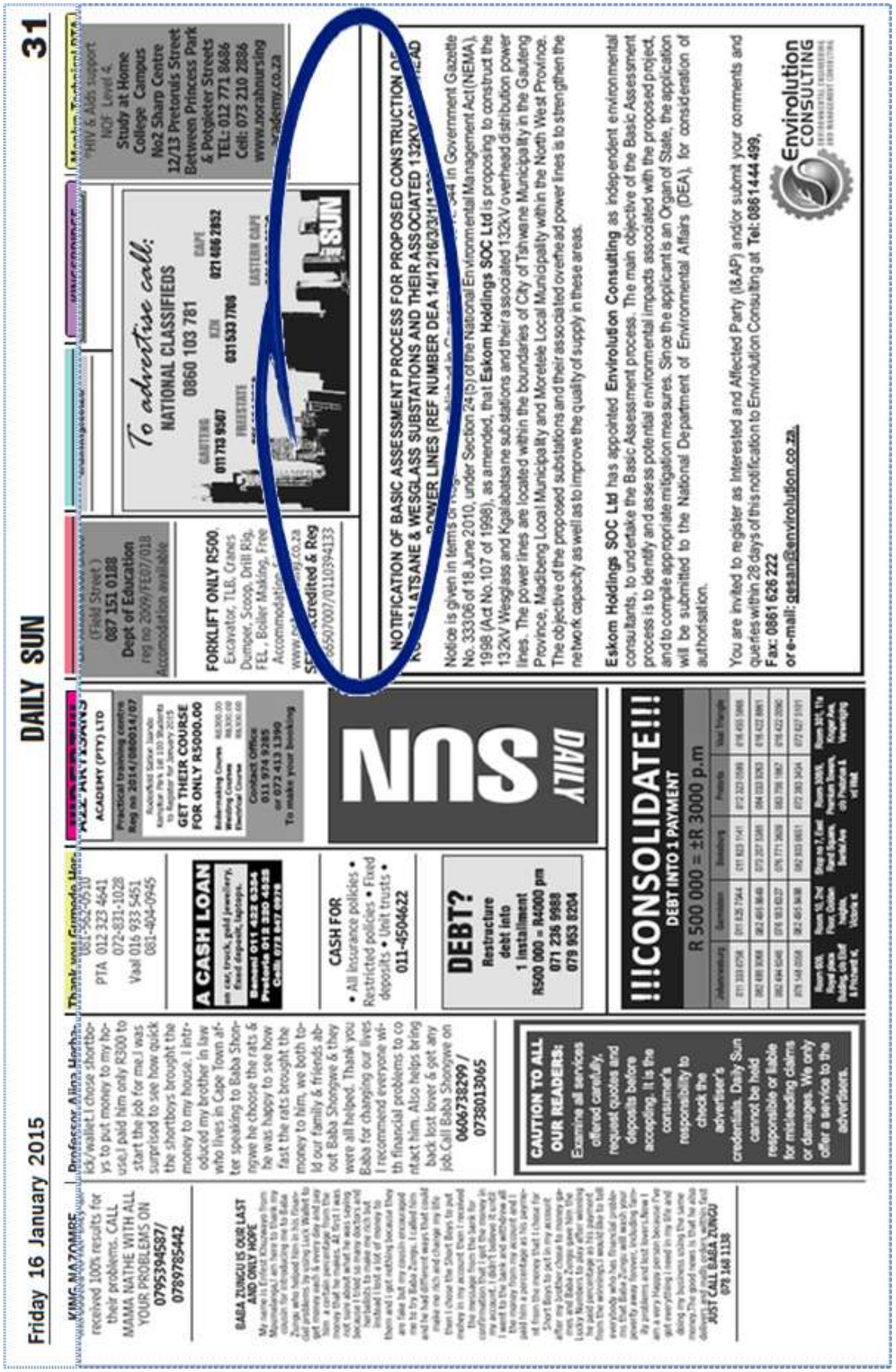


Appendix D: Specialist reports

- **Ecology and Wetland Study**
- **Geotechnical Study**
- **Visual Impact Assessment**
- **Heritage Assessment**

Appendix E: Public Participation

Appendix E1: Proof of adverts



Friday 16 January 2015 DAILY SUN 31

NOTIFICATION OF BASIC ASSESSMENT PROCESS FOR PROPOSED CONSTRUCTION OF ... SUBSTATIONS AND THEIR ASSOCIATED 132KV ... POWER LINES (REF NUMBER DEA 14/12/16/3/3/1/...

Notice is given in terms of ... 544 in Government Gazette No. 33306 of 18 June 2010, under Section 24(5) of the National Environmental Management Act(NEMA), 1998 (Act No.107 of 1998), as amended, that **Eskom Holdings SOC Ltd** is proposing to construct the 132kV Wesglass and Kgalabatsane substations and their associated 132kV overhead distribution power lines. The power lines are located within the boundaries of City of Tshwane Municipality in the Gauteng Province, Madibeng Local Municipality and Moretele Local Municipality within the North West Province. The objective of the proposed substations and their associated overhead power lines is to strengthen the network capacity as well as to improve the quality of supply in these areas.

Eskom Holdings SOC Ltd has appointed **Envirolution Consulting** as independent environmental consultants, to undertake the Basic Assessment process. The main objective of the Basic Assessment process is to identify and assess potential environmental impacts associated with the proposed project, and to compile appropriate mitigation measures. Since the applicant is an Organ of State, the application will be submitted to the National Department of Environmental Affairs (DEA), for consideration of authorisation.

You are invited to register as Interested and Affected Party (I&AP) and/or submit your comments and queries within 28 days of this notification to Envirolution Consulting at **Tel: 0861 444 499, Fax: 0861 626 222 or e-mail: getsan@envirolution.co.za.**

Envirolution CONSULTING

To advertise call: NATIONAL CLASSIFIEDS 0860 103 781

DAILY SUN

Site notices

NOTIFICATION OF BASIC ASSESSMENT PROCESS FOR PROPOSED CONSTRUCTION OF KGABALATSANE & WESGLASS SUBSTATIONS AND THEIR ASSOCIATED 132Kv OVERHEAD POWER LINES

Notice is given in terms of Regulations published in Government Notice R. 544 in Government Gazette No. 33306 of 18 June 2010, under Section 24(5) of the National Environmental Management Act (NEMA), 1998 (Act No.107 of 1998), as amended, that **Eskom Holdings SOC Ltd** is proposing to construct the Wesglass and Kgalabatsane substations and their associated 132kV overhead distribution power lines. The power lines are located within the boundaries of City of Tshwane Municipality in the Gauteng Province, Madibeng Local Municipality and Moretele Local Municipality within the North West Province. The objective of the proposed substations and their associated overhead power lines is to strengthen the network capacity as well as to improve the quality of supply in these areas.

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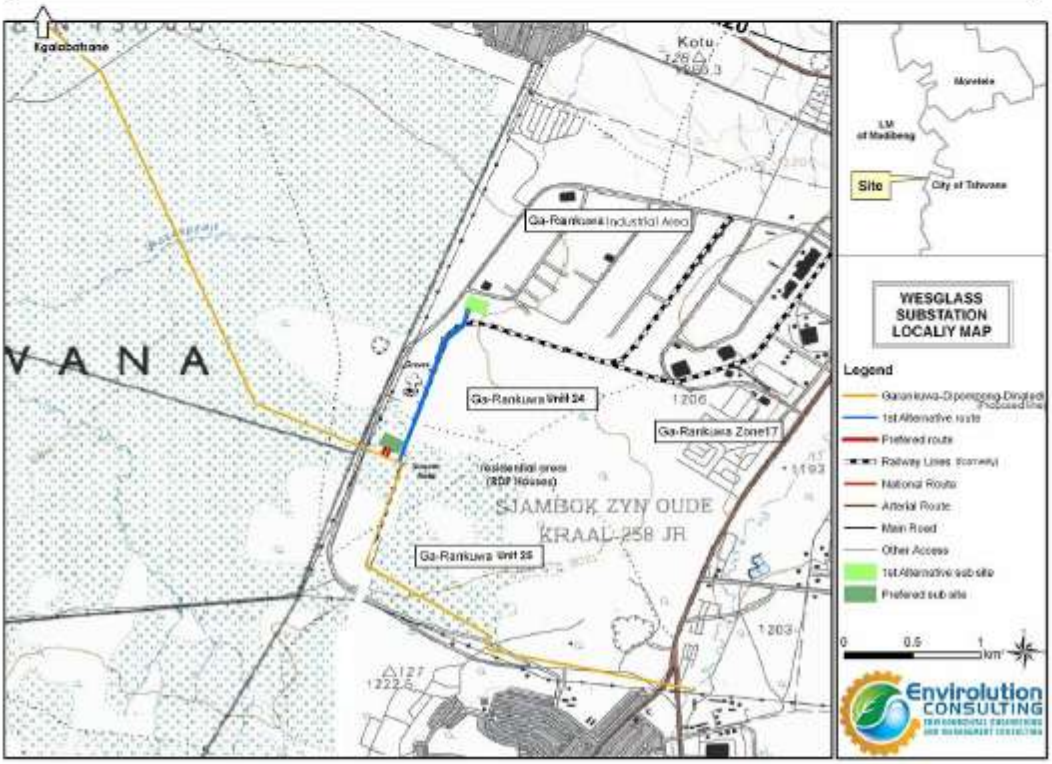
You are invited to register as Interested and Affected Party (I&AP) and/or submit your comments and queries to Envirolution Consulting at
Tel: 0861 444 499, Fax: 0861 626 222 or **e-mail:** marinda@envirolution.co.za.

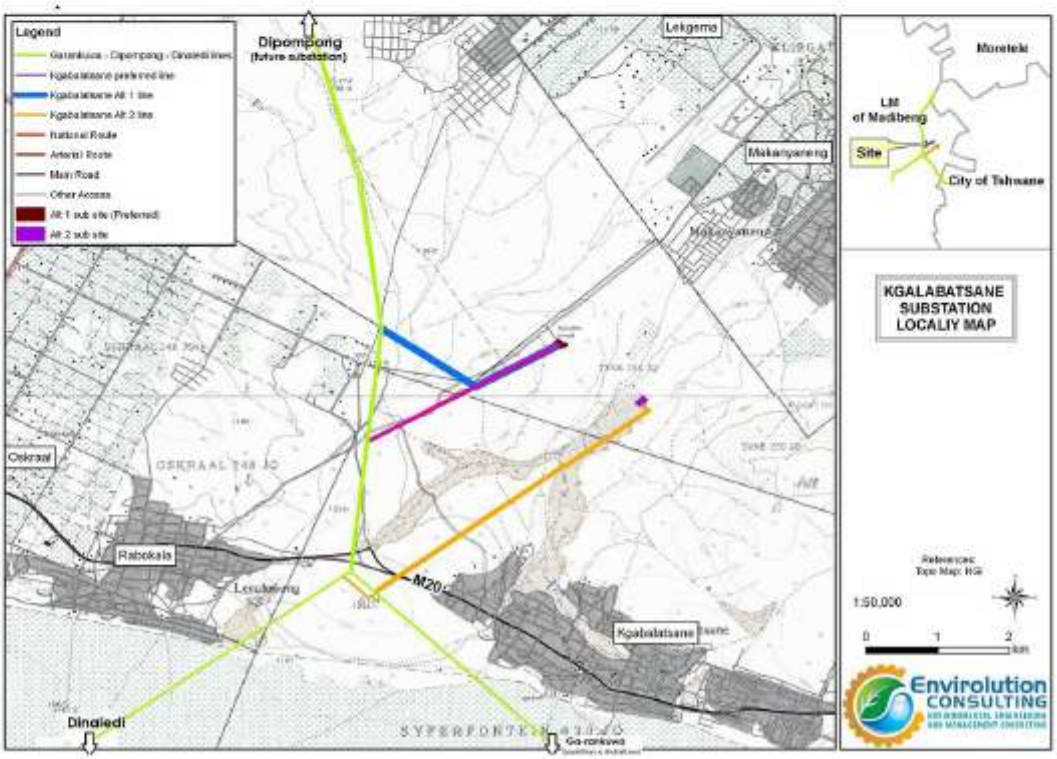


TSEBIŠO YA KGATELOPELE YA MOTHEO YA TLHAHLOBO BAKENG SA GO AGWA MO GO ŠIŠINYWAGO GA KGABALATSANE & WESGLASS TSA 132KV LE MEGALA YA TŠONA YA MOHLAGASE YEO E SEPELAGO GODIMO

Tsebišo e newa ka tlase ga Melawana yeo e gatišitšwego ka go Tsebišo ya Mmušo ya R. 544 ka go Government Gazette No. 33306 ya 18 June 2010, ka tlase ga Karolo 24(5) ya Molao wa Setšhaba wa Taolo ya tša Tikologo (NEMA), 1998 (Molao No.107 wa 1998), ka ge e fetošitšwe, ya gore **Eskom Holdings SOC Ltd** e šišinya go aga diteišene tša Wesglass le Kgalabatsane gotee le megala ya phatlalatšo ya mohlagase yeo e sepelago godimo ya 132kV. Megala ya mohlagase e kgauswi le mellwane ya Toropo ya Mmasepala wa Tshwane Profenseng ya Gauteng, Mmasepala wa Selegae wa Madibeng le Mmasepaleng wa Selegae wa Moretele tšeo di lego Profenseng ya Leboa Bodikela. Pakane ya diteišene tše tšeo di šišinywago gotee le megala ya tšona ya mohlagase yeo e sepelago godimo ke go matlafatša bogolo bja tshepedišo gotee le go kaonefatša boleng bja kabo mafelong a.

Eskom Holdings SOC Ltd e kgethile **Envirolution Consulting** e le baemedi bao ba ikemetšego ba tša tikologo, go tšwetša pele tshepedišo ya Tlhahlobo ya Motheo. Pakane e kgolo ya tshepedišo ya Tlhahlobo ya Motheo ke go hlaola le go lekola ditlamorago tšeo di ka bago gona tša tikologo tšeo di amanago le profeke yeo e šišinywago, gotee le go hlama ditshepedišo tše bonolo tšeo di loketšego. Ka ge modirakgopelo e le Lekgotla la Mmušo, kgopelo e tla lebišwa go Lefapha la Setšhaba la Ditaba tša tša Tikologo (DEA), bakeng sa go naganelwa ga tumelelo.

O laletšwa gore o ngwadiše o le Leloko leo le nago le Kgahlego le leo le Kgomegago (I&AP) le/goba o romele ditlhaloso le dipotšišo go Envirolution Consulting go **Tel: 0861 444 499, Fax: 0861 626 222** or **e-mail:** marinda@envirolution.co.za.



Appendix E2 – notification of stakeholders

Marinda Le Roux

From: Marinda Le Roux [marinda@envirolution.co.za]
Sent: 19 June 2015 12:04 PM
To: 'maboakgolofelo@gmail.com'
Cc: 'Moses Mahlangu'
Subject: Wesglass & Kgablatsane Draft Report for comments

Dear Sir

The Draft Basic Assessment Report and appendices are available at:
https://www.dropbox.com/sh/jo3iyfeqtbsp4fj/AAD5ENT8--TI4kJ-Z_OA60qja?dl=0

Please submit your comments in writing to me at marinda@envirolution.co.za or to Mr Moses Mahlangu at delno@telkomsa.net on or before the 20th of July 2015.06.19

Regards

Marinda le Roux EAPSA * TRPSA
Project Manager

Marinda Le Roux

From: Marinda Le Roux [marinda@envirolution.co.za]
Sent: 19 June 2015 12:05 PM
To: 'moabithabo@gmail.com'
Cc: 'Moses Mahlangu'
Subject: RE: Wesglas-Kgalabatsane Eskom line & substations

Dear Cllr Thabo Moabi

The Draft Basic Assessment Report and appendices have been submitted to DEA, the City of Tshwane and the Madibeng Municipality today.
Should you or the community be interested to review the reports, these are available at:
https://www.dropbox.com/sh/jo3iyfeqtbsp4fj/AAD5ENT8--TI4kJ-Z_OA60qja?dl=0

Please submit your comments in writing to me at marinda@envirolution.co.za or to **Mr Moses Mahlangu** at delno@telkomsa.net on or before the 20th of July 2015.

Regards

Marinda le Roux EAPSA * TRPSA
Project Manager

Marinda Le Roux

From: Marinda Le Roux [marinda@envirolution.co.za]
Sent: 13 July 2015 09:00 AM
To: 'Buti J. Maponyane'
Subject: FW: Wesglas cemetery
Attachments: S22C-615071307110.pdf

Importance: High

Dear Mr **Buti Maponyane**

012 358 8936 082 555 8631.. Gauteng **Tshwane** Metro. Executive Member, Ncedisa Ntulini

Attached please find the attendance list for the site meeting of Friday, that was held to discuss the situation related to the cemetery expansion.
No formal minutes were taken, but notes are as follows:

- Ms Barileng Dichaba and Mr Lucas Mashigo (Senior Administrator of Cemeteries) from the City of Tshwane has confirmed that the planning for the cemetery is to expand the area between the exisiting cemetery and the industrial area ONLY.
- The Application for a substation and connection to the Garankuwa-Dipompong-Dinaledi line will remain unchanged to DEA, with the motivation to support the southernmost (preferred Alternative 1) now emphasised by the cemetery expansion that will take up the area where Alternative 2 has been considered. The FINAL BAR for the Eskom application will include this information, and the application by Aurecon should be modified accordingly.

- The FBAR for the cemetery expansion will motivate that the southernmost Alternative for their project will not be feasible, due to the Eskom infrastructure that has been proposed.

Marinda Le Roux

From: Marinda Le Roux [marinda@envirolution.co.za]
Sent: 13 July 2015 08:58 AM
To: 'Natanya Whitehorn'; 'Neo Masemola'; 'Ziyanda Maqubela'; 'Priscilla Mogomotsi'
Cc: 'Gesan Govender'
Subject: Wesglas cemetery
Attachments: S22C-615071307110.pdf

Importance: High

Dear All

Attached please find the attendance list for the site meeting of Friday, that was held to discuss the situation related to the cemetery expansion.
No formal minutes were taken, but notes are as follows:

- Ms Barileng Dichaba and Mr Lucas Mashigo (Senior Administrator of Cemeteries) from the City of Tshwane has confirmed that the planning for the cemetery is to expand the area between the exisiting cemetery and the industrial area ONLY.
- The Application for a substation and connection to the Garankuwa-Dipompong-Dinaledi line will remain unchanged to DEA, with the motivation to support the southernmost (preferred Alternative 1) now emphasised by the cemetery expansion that will take up the area where Alternative 2 has been considered. The FINAL BAR for the Eskom application will include this information, and the application by Aurecon should be modified accordingly.

- The FBAR for the cemetery expansion will motivate that the southernmost Alternative for their project will not be feasible, due to the Eskom infrastructure that has been proposed.

Marinda Le Roux

From:	Marinda Le Roux [marinda@envirolution.co.za]
Sent:	28 October 2014 10:49 AM
To:	'Harmen.dendulk@gauteng.gov.za'; 'Harmen.dendulk@gmail.com'; 'mphomagasa@madibeng.gov.za'; 'bsebogodi@nwpg.gov.za'; 'thembelihle.mlangeni@gauteng.gov.za'; 'rudzanim@tshwane.gov.za'; 'TshifhiwaG@tshwane.gov.za'
Subject:	NOTIFICATION OF PROPOSED CONSTRUCTION OF ESKOM's KGALABATSANE AND WESGLASS SUBSTATIONS AND THEIR ASSOCIATED 132kV OVERHEAD POWERLINES

Dear Land Owner

Eskom Holdings SOC Limited is proposing to construct the Kgalabatsane and Wesglass Substations and their associated overhead Power Lines to strengthen the network supplying the Ga-Rankuwa and Madibeng areas (north of Soshanguve) within Gauteng and North-West Provinces. Eskom Holdings SOC Ltd has appointed Envirolution Consulting as independent environmental consultants, to undertake the Basic Assessment (BA) process.

The 33kV networks in the area are overloading and there is a need to establish a new substation in Kgalabatsane to deload the 33kV and reticulation feeders in the area. The proposed substation at Kgalabatsane will contribute to the electrification of the Kgabalatsane area. This substation is situated in the middle of the 3 townships that it will be feeding, namely Rabokala/Lerulaneng, Kgabalatsane and Makanyaneng. The proposed Kgalabatsane substation will be located approximately 16km south from the future Dipompong substation and 4km north-west of the proposed Wesglass substation. Wesglass Substation is currently a 33/11kV substation, supplying the industrial areas in the study area. There are low voltage problems and the voltage dips from quality of supply, as well as supply interruption have resulted in customer complaints. The proposal is that the substation is to be upgraded to the 132kV network and a loop-in, loop-out will be created from the Kgalabatsane substation in North West Province. This will improve the performance of the supply and minimise interruptions of service. The proposed Wesglass substation will be located approximately 4km south of the Kgalabatsane substation. The Wesglass substation is located 30km north of the Pretoria CBD and 9km from Soshanguve (Gauteng) and 21km east of Brits (North West Province). Please refer to locality maps below.

KNOCK AND DROP REGISTER

PROJECT NAME: NOTICE OF BASIC ASSESSMENT FOR THE PROPOSED NOTIFICATION OF BASIC ASSESSMENT PROCESS FOR PROPOSED CONSTRUCTION OF KGABALATSANE & WESGLASS SUBSTATIONS AND THEIR ASSOCIATED 132KV OVERHEAD POWER LINES (REF NUMBER DEA 14/12/16/3/3/1/1320)

Date: 15 January 2015

NAME AND SURNAME	ADDRESS	TEL NO	CELLPHONE	FAX NO/EMAIL ADDRESS	SIGNATURE	
Anna Amanda	Kgabalatsane	—		—		
Tebogo Mhlongo	1382 Kgabalatsane, Mangong	0761980241	0761980241	—		
Mogorosi	Kgabalatsane		082 9454567	—		
Motshwane	591 Molelong	—		—		
Josephine Selemogo	1591B Moreteng Kgabalatsane	—	0766164700	—		
	6057 Rabokala					11:22
	655					11:24
Karabelo Dhlomo	605 Rabokala	073 117 5790				
	699 Rabokala					11:26

DEA REF NUMBER DEA 14/12/16/3/3/1/1320

NAME AND SURNAME	ADDRESS	TEL NO	CELLPHONE	FAX NO/EMAIL ADDRESS	SIGNATURE	
	48 Ga-Rankuwa					12:50
	44 Ga-Rankuwa Ext 24					12:51
	43 Ga-Rankuwa Ext 24					12:51
	45 Ga-Rankuwa Ext 24					12:52
	47 Ga-Rankuwa Ext 24					12:52
Michael R[illegible]	49 Garankuwa 24	0782412330			[signature]	
	40 Ga-Rankuwa Ext 24					12:54
	41 Ga-Rankuwa Ext 24					12:59
	11 Ga-Rankuwa					13:33
	12 Ga-Rankuwa					13:33
	13 Ga-Rankuwa					13:33
	14 Ga-Rankuwa					13:33
	4 Ga-Rankuwa					13:40
	5 Ga-Rankuwa					13:40
	6 Ga-Rankuwa					13:40
	7 Ga-Rankuwa					13:40

DEA REF NUMBER DEA 14/12/16/3/3/1/1320

Envirolution CONSULTING
ENVIRONMENTAL ENGINEERING AND MANAGEMENT CONSULTING

KNOCK AND DROP REGISTER

PROJECT NAME: NOTICE OF BASIC ASSESSMENT FOR THE PROPOSED NOTIFICATION OF BASIC ASSESSMENT PROCESS FOR PROPOSED CONSTRUCTION OF KGABALATSANE & WESGLASS SUBSTATIONS AND THEIR ASSOCIATED 132KV OVERHEAD POWER LINES
(REF NUMBER DEA 14/12/16/3/3/1/1320)

Date: 15 January 2015

NAME AND SURNAME	ADDRESS	TEL NO	CELLPHONE	FAX NO/EMAIL ADDRESS	SIGNATURE
Sophy Maremela	1536 Kgabalatsane Mosha	-	0726356949	-	[signature]
Maria Masilo	1588B Moroeleng	-	0717084396	-	[signature]
Kate Masilo	1588C Moroleng	0724185844			[signature]
Simon Chauke	1589 moroleng	0725762755	0725762755	N/A	[signature]
Motsepe	Moroleng Sec.		0836025923		[signature]
J. Lebeko	Rabokala 664 B		0728654126/0818051872		[signature]
B. Dirane	Rabokala 664 A		0524362333		[signature]
Lebeko	Rabokala 717		0725768184		[signature]
Selemane Koetswe	Rabokala 662		0793724135		[signature]

DEA REF NUMBER DEA 14/12/16/3/3/1/1320

NAME AND SURNAME	ADDRESS	TEL NO	CELLPHONE	FAX NO/EMAIL ADDRESS	SIGNATURE
	Rabokala 661				
T C Nkolusi	692 Ext 24 Garankuwa C		076 073 0788		
	1370 GaRankuwa				
Jeanette Selepe	1368 Ga-Rankuwa		0784897949		
—	1367 GA-Rankuwa		—		—
	1366 GA-Rankuwa		—		—
Thabo Kgosi-ng	1365 GA-Rankuwa				T/Kgosing
Siphathisiwe Mathe	1364 Ga-Rankuwa		0781640525		S Mathe
Josiah Radebe	1363 Ga Rankuwa		0837453512		
Tshiamo Moche	1361 GaRankuwa		0793928870		T.MOCHE
Dipuo Hoseka	1358 Ga-rankuwa		0712097189		
Precious Lefifi	1356 GA-Rankuwa		0731806837		
Ellah Mathibela	1355 Ga-Rankuwa		0606748394		EMathibela
Manuel Matsei	1354 Ga-Rankuwa		0729711550		
Ellen Ndebele	17 Ext24 GaRankuwa		0799673838		
Queen Meetse	1229 Ext24 Ga-Rankuwa		0783082880		
J.S. Rapatla	16 Ext-24 "		012 797 8800		
M.P. Sempane	1333 Ext. 24 "		0786717572		

DEA REF NUMBER DEA 14/12/16/3/3/1/1320

NAME AND SURNAME	ADDRESS	TEL NO	CELLPHONE	FAX NO/EMAIL ADDRESS	SIGNATURE
Eri. Madi	1230 Ext 24		0790549561		
K. Morefe	163 " 25		071 737 1207		Molefe
Refilwe Mogale	162 " 25		0720932444		R. Mogale
PM Itshosetseng	161 " 25		0798722647		[illegible]
Clementine MALOKA	160 Ext. 25		076 417 7252		[illegible]

DEA REF NUMBER DEA 14/12/16/3/3/1/1320

Envirolution CONSULTING
ENVIRONMENTAL ENGINEERING AND MANAGEMENT CONSULTING

KNOCK AND DROP REGISTER

PROJECT NAME: NOTICE OF BASIC ASSESSMENT FOR THE PROPOSED NOTIFICATION OF BASIC ASSESSMENT PROCESS FOR PROPOSED CONSTRUCTION OF KGABALATSANE & WESGLASS SUBSTATIONS AND THEIR ASSOCIATED 132KV OVERHEAD POWER LINES
(REF NUMBER DEA 14/12/16/3/3/1/1320)

Date: 15 January 2015

NAME AND SURNAME	ADDRESS	TEL NO	CELLPHONE	FAX NO/EMAIL ADDRESS	SIGNATURE
Saul KGASI	E 11 Okgabalatsane	—	0631220992	—	Kgasi
Gloyce Manamela	1581 Moeowana sec Kgabalatsane	—	0718870400[illegible]	—	[illegible]
Karabo Mozolo	E 91 Kgabalatsane	—	0768681968	—	K.J. [illegible]
Kgomotso Makuse	1585 B Kgabalatsane	—	073 155 9838	—	[illegible]
Daniel Komane	1590 Kgabalatsane	—	0428641034	—	[illegible]
Mithadi	1591 Kgabatsane	11:00	0726568833	—	
	E98 1100	11:00		—	
LJ KOMANE	1658 RABOKALA	—	0723425599	—	[illegible]
M.N MADISA	734 RABOKALA	11:26	0723890749	—	[illegible]

DEA REF NUMBER DEA 14/12/16/3/3/1/1320

NAME AND SURNAME	ADDRESS	TEL NO	CELLPHONE	FAX NO/EMAIL ADDRESS	SIGNATURE
Lucky Botha	693 Rabokala	—	0738528930	—	Botha
Polenela	666 Rabakala	—	08324567[illegible]	—	Polenela
[illegible]	732 Rabokala	—			
[illegible]	699 Rabokala	—	—		[illegible]
—	668 Rabakala				
Pati	655 Rabokala		0712835275		Pati
Raymond	59 G- 24		081 8286132		Roy
	60 G 24 12:47				
	61 G 24 12:47				
	58 G 24 12:47				
	52 24				
Zacharia	55 Bot 24 Isonami		0786728901		S. [illegible]
[illegible]	53 24 12:55				
	52 24 [illegible]		0763369558		[illegible]
	51 24 12:59				
	50 24 12:55				
	49 24 [illegible] 12:54				
	1360 24 [illegible]				
	1359 24 [illegible] 1:04				

DEA REF NUMBER DEA 14/12/16/3/3/1/1320

NAME AND SURNAME	ADDRESS	TEL NO	CELLPHONE	FAX NO/EMAIL ADDRESS	SIGNATURE
[illegible]	39 24 Scott		0766548048		[illegible]
,	36 24 [illegible]				
Nelson Moepi	35. 24 1:16		0745015024		[illegible]
Cecilia Sesoko	33 : 24		0730123026		[illegible]
~~H. Sa-Phetgo~~	34 : 24 1:17				
M. Sathekge	32 : 24		0827252380		[illegible]
	30 : 24 1:22				
	31 : 24 1:22				
	27 : 24 1:23				
A. Z. Nkoine	28 / 24		0835964703		[illegible]
	25 1:24				
D Mokhoko	24 Ext 24		0721590086		[illegible]
	21 Ext 24 1:28				
	20 Ext 24 1:28				
	19 Ext 24 1:29				
	18 Ext 24 1:29				
	15 Ext 24 1:33				
	14 Ext 24 1:34				

DEA REF NUMBER DEA 14/12/16/3/3/1/1320

NAME AND SURNAME	ADDRESS	TEL NO	CELLPHONE	FAX NO/EMAIL ADDRESS	SIGNATURE
	04 Ext 24		0736718946		
	08 Ext 24 1337				
	07 Ext 24 1378				
	01 Ext 29 1340				
	02 Ext 24 1340				
	01 Ext 24 1343				
	02 1 Ext 24 1343				
Marcia	06 Ext 24		0820543022		Marcia
	07 Ext 24 1341				
	08 Ext 24 1342				
	09 Ext 24 1353				
	10 Ext 24 1353				

DEA REF NUMBER DEA 14/12/16/3/3/1/1320

Appendix E Comments and response report for Kgabalatsane

COMMENTS	RESPONSE
In the presentation it is mentioned that two substations are being considered. Does this mean that two substations are going to be constructed in our area or two alternatives are being considered to decide on the position of one substation?	Application for Environmental Authorisation has initially been made for two substations (*one in Wesglass and one in Kgabalatsane, but Wesglass will now be applied for at a later stage).. **Once approved, only one substation will be constructed in Kgabalatsane.**
In building the new substation are you considering increasing the reliability of electricity supply in Kgabalatsane only or the project will also benefit other areas like Dipompong?	The project as a whole is extensive and Eskom planned to develop it in stages. For the substation alternative sites are investigated. Having a substation in the area will help in that if one substation experiences technical problems this will not affect the supply of electricity. Mr Masemola explained that the project introduced previously is a precursor to this one
Presentation has just been done; does it mean the council is expected to give comment now?	Mr Mohlala explained that a Draft Basic Assessment Report will be made available for public scrutiny. Forty days comment period will be allowed.
Is this new project being planned because of the current load shedding incidences or it has always been in the plan of Eskom for the area?	The project has been planned as part of the regional distributional network, and not due to the load shedding incidents
The process of elucidating comments from the public by way of distributing reports at different strategic places is considered to be ineffective because very few people actually go out there to read these reports. The council proposes that a meeting be arranged where members of the community can be addressed by the study team about the proposed project	A meeting will be considered, and the community will be informed via councillors. The IAPs that have been registered during the period after the project was announced, will receive invitations via e-mail and/or phone.
The issue of how servitude is acquired and how compensation will be paid for must be explained to the community at large to eliminate all suspicions of mismanagement of the money paid for servitude acquisition	The issue of land rights and acquisition will be explained at future discussions with land owners and IAPs.
The project must be labor intensive so that local people can get some jobs	Eskom has a policy of utilising local labour for certain aspects of the work, but much of the work requires advanced skills and machinery.
What are the timeframes for the construction of this project	At this stage Eskom is still negotiating for servitude for the first project. For now Eskom is estimating 2017 as the target date for construction of the second phase (Kgabalatsane)
The project is welcomed but Eskom must first resolve the issue of unpaid servitudes for existing powerlines. Presentations on the outstanding payment have been made to Eskom	This issue falls outside the scope of this project, but the responsible representative at Eskom will investigate any such claims.

COMMENTS	RESPONSE
but they are not being attended to.	
The attendees indicated that the project is welcomed and they wanted to know if the project will help Eskom to solve the electricity problem in the area.	The offer is appreciated. Eskom is dedicated to improving service provision.
The exact location of the substation was discussed as some members wanted clarification on the position of the substation	The location was explained where the substation was going to be located.
Attendees wanted to know about the timeframe of for construction	It was explained that the expected date is late 2017.
One member of the local community confirmed that the project has been explained to the public and generally the public welcomes the project	The attitude is welcomed. Thank you.
The councillor explained that power cut was very frequent in December and it has been found that people from the surrounding squatter area were illegally tapping electricity from the paying. The councillor mentioned that the matter was reported and Eskom does not seem to take is serious.	It was advised that such matters be reported to Eskom in Rustenburg

Appendix E4 – Communication with State Departments

Envirolution CONSULTING
ENVIRONMENTAL ENGINEERING AND MANAGEMENT CONSULTING

PO Box 1898 • Sunninghill 2157
223 Columbine Avenue • Mondeor 2091
Tel: 0861 44 44 99
Fax: 0861 626 222
Email: info@envirolution.co.za
www.envirolution.co.za

11 October 2014

Gauteng Department of Public Transport, Roads and Works
Sage Life Towers,
No. 41 Simmonds Street,
6th Floor, Marshal Town
2000

For the Attention of **Mr Dennis Emmet**

NOTIFICATION OF BASIC ASSESSMENT PROCESS FOR THE PROPOSED CONSTRUCTION OF 132KV KGABALATSANE & WESGLASS SUBSTATIONS AND THEIR ASSOCIATED POWER LINES

Dear Mr Emmet

Eskom Holdings SOC Ltd has appointed **Envirolution Consulting** as independent environmental consultants, to undertake the Basic Assessment process for the project mentioned above (see map attached). The main objective of the Basic Assessment process is to identify and assess potential environmental impacts associated with the proposed project, and to compile appropriate mitigation measures. The properties that might be affected by this proposed development are:

NAME:	PORTION 0 OF THE FARM SYFERFONTEIN 430JQ
SIZE:	4377.5951H
OWNER:	**GOVERNMENT OF THE REPUBLIC OF SOUTH AFRICA**
SG NUMBER:	T0JQ00000000043000000
NAME:	PORTION 3 OF SJAMBOK ZYN OUDE KRAAL 258-JR
SIZE:	599.2544556HA
OWNER:	**CITY OF TSHWANE METROPOLITAN MUNICIPALITY**
SG NUMBER:	T0JR00000000025800003
NAME:	PORTION 1 (REMAINING EXTENT) OF THE FARM OSKRAAL 248JQ
SIZE:	8.8627H
OWNER:	**NOT AVAILABLE (FORMER REPUBLIC OF BOPHUTHATSWANA)**
SG NUMBER:	T0JQ00000000024800001

As land owner of the abovementioned properties (please verify), you will be involved throughout the public consultation process. Furthermore, you will have an opportunity to comment by raising issues of concern and/or suggestions for enhanced benefits and/or alternatives; and to ensure that the competent authority, the Department of Environmental Affairs (DEA), has sufficient information to make a decision. Registration with the Department of Environmental Affairs is in process, and you will receive more information during the announcement phase of this project. For effective communication, you are requested to send us your contact details (e-mail address/fax number and contact numbers).

Should you have any questions, or would like to obtain more information, please feel free to contact us at Tel: 0861 444 499, Fax: 0861 626 222 or marinda@envirolution.co.za

Kind Regards

Marinda le Roux
Certified EA

Envirolution Consulting (Pty) Ltd
Reg No 2001/029956/07
K Govender B Sc (Hons) (Wits) Pr. Sci. Nat

Envirolution CONSULTING
ENVIRONMENTAL ENGINEERING AND MANAGEMENT CONSULTING

PO Box 1898 • Sunninghill 2157
223 Columbine Avenue • Mondeor 2091
Tel: 0861 44 44 99
Fax: 0861 626 222
Email: info@envirolution.co.za
www.envirolution.co.za

11 October 2014

Madibeng Local Municipality
53 van Velden Street,
P.O.Box 106,
Brits
0250

Tel: (012) 318 9100
Tel:(+27) 12 318 9215
Fax:(+27) 12 318 9203
Fax: (012) 318 9203

For the Attention of **Ms Mpho Magasa**

NOTIFICATION OF BASIC ASSESSMENT PROCESS FOR THE PROPOSED CONSTRUCTION OF 132KV KGABALATSANE & WESGLASS SUBSTATIONS AND THEIR ASSOCIATED POWER LINES

Eskom Holdings SOC Ltd has appointed **Envirolution Consulting** as independent environmental consultants, to undertake the Basic Assessment process for the project (see map below). The main objective of the Basic Assessment process is to identify and assess potential environmental impacts associated with the proposed project, and to compile appropriate mitigation measures. The property that might be affected by this proposed development is:

Property Name:	PORTION 0 (REMAINING EXTENT) OF THE FARM TYNE 250 JQ
Size:	1054,5074 HA
Owner:	MADIBENG LOCAL MUNICIPALITY
SG number:	T0JQ00000000025000000

As land owner of the above mentioned property you will be involved throughout the public consultation process. Furthermore, you will have an opportunity to comment by raising issues of concern and/or suggestions for enhanced benefits and/or alternatives; and to ensure that the competent authority, the Department of Environmental Affairs (DEA), has sufficient information to make a decision. Registered with the Department of Environmental Affairs is in process, and you will receive more information during the announcement phase of this project. For effective communication, you are requested to send us your contact details (e-mail address/fax number and contact numbers). Should you have any questions, or would like to obtain more information, please feel free to contact us at Tel: 0861 444 499, Fax: 0861 626 222 or marinda@envirolution.co.za

Kind Regards,

MleRoux

Marinda le Roux
Certified EAP

Envirolution Consulting (Pty) Ltd
Reg No 2001/029956/07
K Govender B Sc (Hons) (Wits) Pr. Sci. Nat

PO Box 1898
Sunninghill 2157

223 Columbine Avenue
Mondeor
2091

Tel: 0861 44 44 99
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Email: info@envirolution.co.za
www.envirolution.co.za

Envirolution CONSULTING
ENVIRONMENTAL ENGINEERING AND MANAGEMENT CONSULTING

DELIVERY NOTE: Acknowledgement of Receipt

PROJECT NAME: **Proposed construction of the Kgalabatsane and Wesglass Substations and their associated 132kV Overhead Power Lines**

DEA Reference: DEA: 14/12/16/3/3/1/1320

CONTENTS: DRAFT BASIC ASSESSMENT REPORT

NUMBER OF COPIES: 2 hard copies, 2 CDs

ENVIRONMENTAL AFFAIRS
INT ENV AUTH
2015 -06- 22
SIGN:

DELIVER TO: **DEA Integrated Environmental Authorisations**

ATTENTION: Mr Herman Alberts (EIA Admin)

ADDRESS: Cnr. Steve Biko (previously Beatrix Street) & Soutpansberg Road
Environment House, 473 Steve Biko, Arcadia, Pretoria, 0083

RECEIVED BY: Tumelo Maike (Print Name) Date: 22/06 Time: 12:06

(Signature)

FOR OFFICE USE:

DELIVERED BY	ENVIROLUTION CONSULTING
COURIER COMPANY:	NAME: --Marinda le Roux----------
NAME: _____	DATE: 18 June 2015
DATE: _____	Special instruction(s) to driver:
TIME: _____	_____
	_____

Local Municipality of
Madibeng

P O Box 106
BRITS
0250
Tel: (012) 318 9100
Fax: (012) 318 9203
email:
madibeng@icon.co.za

Reference	18/1/2/3/5
Contact	M.T Magasa

Civic Centre
53 Van Velden Street
BRITS

22nd January 2015

Envirolution Consulting
PO Box 1898
Sunninghill
2157

Att: Marinda le Roux
Tel : 0861 444 499
Fax : 0861 626 222
Email : info@envirolution.co.za

Dear Sir

BID-NOTIFICATION OF BASIC ASSESSMENT PROCESS FOR THE PROPOSED CONSTRUCTION OF 132Kv KGABALATSANE & WESGLASS SUBSTATIONS AND THEIR ASSOCIATED POWERLINES.

Your letter of notice for the above mentioned activity submitted to our office on the 21 January 2015 has reference.

This letter serves to inform you that the Department of Community Services has received your notice of intent regarding the above mentioned activity. However the following issues should be taken into consideration.

- Kindly register us as Interested and Affected Party in your database.
- Adjacent landowners to the proposed site must be informed.
- All specialist studies which may be required to complete the application must be done and submitted to this Department for comments.
- All records pertaining public participation meetings and reports must be submitted to the Department of Community Services.
- Please, ensure that you familiarise yourselves with the Madibeng Local Municipality SDF, 2009 for Zoning and proposed land use of the area.
- You are requested to submit one (1) electronic copy (the main report must be separated from the appendices (each appendix saved separately) (CD/DVD) and one (1) hard copy of the Draft report to this Department.

- You are hereby reminded of section 24F of the National Environmental Management Act, Act No 107 of 1998, as amended, that no activity may commence prior to an environmental authorisation being granted by the relevant department.
- If general waste will be taken to the municipal landfill site or any other landfill site, all receipt of dumping should be kept so that as to avoid illegal dumping from your service providers and you are further being referred to the Madibeng local Municipality Waste Management By-Law 1/2008 for the transportation and storage of waste.

Thanking you in advance.

Yours faithfully

for **Municipal Manager**
NEM/mtm

PO Box 1898 • Sunninghill 2157
223 Columbine Avenue • Mondeor 2091
Tel: 0861 44 44 99
Fax: 0861 626 222
Email: info@envirolution.co.za
www.envirolution.co.za

11 October 2014

The Department of Public Works (Pretoria Region)
AVN Building
Cnr Skinner & Andries Street
Private Bag X229,
Pretoria
0001

Tel: 012 310 5192/012 337 2000
Fax No: +27 12 328 4217 Cell: 082 814 8848
Molatelo.Mohwasa@dpw.gov.za

For the attention of Mr Molatelo Mohwasa

NOTIFICATION OF BASIC ASSESSMENT PROCESS FOR THE PROPOSED CONSTRUCTION OF KGABALATSANE & WESGLASS SUBSTATIONS AND THEIR ASSOCIATED 132KV POWER LINES

Dear Mr Emmet

Eskom Holdings SOC Ltd has appointed **Envirolution Consulting** as independent environmental consultants, to undertake the Basic Assessment process for the project mentioned above (see map attached). The main objective of the Basic Assessment process is to identify and assess potential environmental impacts associated with the proposed project, and to compile appropriate mitigation measures. The properties that might be affected by this proposed development are:

NAME:	PORTION 0 OF THE FARM SYFERFONTEIN 430JQ
SIZE:	4377.5951H
OWNER:	**GOVERNMENT OF THE REPUBLIC OF SOUTH AFRICA**
SG NUMBER:	T0JQ00000000043000000

NAME:	PORTION 1 (REMAINING EXTENT) OF THE FARM OSKRAAL 248JQ
SIZE:	8.8627H
OWNER:	**NOT AVAILABLE (FORMER REPUBLIC OF BOPHUTHATSWANA)**
SG NUMBER:	T0JQ00000000024800001

As land owner of the abovementioned properties (please verify), you will be involved throughout the public consultation process. Furthermore, you will have an opportunity to comment by raising issues of concern and/or suggestions for enhanced benefits and/or alternatives; and to ensure that the competent authority, the Department of Environmental Affairs (DEA), has sufficient information to make a decision. Registration with the Department of Environmental Affairs is in process, and you will receive more information during the announcement phase of this project. For effective communication, you are requested to send us your contact details (e-mail address/fax number and contact numbers).

Should you have any questions, or would like to obtain more information, please feel free to contact us at Tel: 0861 444 499, Fax: 0861 626 222 or marinda@envirolution.co.za

Kind Regards

Marinda le Roux
Certified EA

Envirolution Consulting (Pty) Ltd
Reg No 2001/029956/07
K Govender B Sc (Hons) (Wits) Pr. Sci. Nat

2 June 2015 **DEA: 14/12/16/3/3/1/1320**

RE: Regulation 67 Requirements

PROPOSED CONSTRUCTION OF THE KGALABATSANE (A) AND WESGLASS (B) SUBSTATIONS AND THEIR ASSOCIATED 132KV OVERHEAD POWER LINES GAUTENG & NORTH WEST PROVINCES

The Application form for the above mentioned project was submitted on 11 November 2014. DEA has acknowledged receipt thereof on 14 November 2014. On 14 June 2015, the 6 months' period to submit the DBAR will expire, and thus (in terms of Regulation 67 of the 2010 EIA Regulations) we request an extension for the submission of the Draft Basic Assessment Reports for the above-mentioned application. The Applicant still needs to complete the public review period for the DBAR, and the Final BAR will be submitted after the public has had time to review the contents of the DBAR and comment.

We are therefore requesting an extension of the six month timeframe as noted in Regulation 67.

Yours sincerely,

Marinda le Roux (Project EAP)

For Envirolution Consulting (Pty) Ltd

RE: Wesglas-Kgalabatsane Eskom line & substations

Marinda Le Roux [marinda@envirolution.co.za]

You forwarded this message on 2015/06/29 08:14 AM.

Sent: Fri 2015/06/19 12:05 PM
To: 'moabithabo@gmail.com'
Cc: 'Moses Mahlangu'

Dear Cllr Thabo Moabi

The Draft Basic Assessment Report and appendices have been submitted to DEA, the City of Tshwane and the Madibeng Municipality today.
Should you or the community be interested to review the reports, these are available at:
https://www.dropbox.com/sh/jo3iyfeqtbsp4fj/AAD5ENT8--Tl4kJ-Z_OA60qja?dl=0

Please submit your comments in writing to me at marinda@envirolution.co.za or to **Mr Moses Mahlangu** at delno@telkomsa.net on or before the 20th of July 2015.

Regards

Marinda le Roux EAPSA * TRPSA
Project Manager

Wesglass & Kgablatsane Draft Report for comments

Marinda Le Roux [marinda@envirolution.co.za]

Sent: Fri 2015/06/19 12:04 PM
To: 'maboakgolofelo@gmail.com'
Cc: 'Moses Mahlangu'

Dear Sir

The Draft Basic Assessment Report and appendices are available at:
https://www.dropbox.com/sh/jo3iyfeqtbsp4fj/AAD5ENT8--Tl4kJ-Z_OA60qja?dl=0

Please submit your comments in writing to me at marinda@envirolution.co.za or to Mr Moses Mahlangu at delno@telkomsa.net on or before the 20th of July 2015.06.19

Regards

Marinda le Roux EAPSA * TRPSA
Project Manager

Envirolution CONSULTING

Appendix E6 Minutes
Attendance lists of Stakeholder meetings

BASIC ASSESSMENT FOR THE PROPOSED WESGLASS-KGABALATSANE SUBSTATIONS AND 132KV OVERHEAD LINES (ESKOM DISTRIBUTION)

REF DEA: 14/12/16/3/1/1320

MINUTES OF MEETINGS HELD IN GARANKUWA
23 March 2015

The minutes recorded hereunder reflect on the discussions held with:

1. Bakwena ba Mokgopa Traditional Authority at the Traditional Authority offices
2. Ward Committee representatives for wards 10 and 35 (Clr. Machete and Clr Masina) and key stakeholders representative of Kgabalatsane (Pre-schools; veterans; electricity; business)
3. Klipgaat Ward 36 Councilor – Clr. Raseroka

*"**Note**: Discussions were held in Tshwana and Northern Sotho. The minutes as recorded here under are the reflection of the presentation and discussion of the public meeting for the above project. These minutes are not recorded as verbatim pronouncement but merely as summary of what was said. Mr Solly Mohlala of Envirolution Consulting and Mr. Neo Masemola of Eskom gave background and explanations of the project.*

ITEM	PRESENTATION
1. Introduction and Registration	▪ The chairperson of the Bakwena ba Mokgopa Traditional Authority welcomed all in attendance and introduced members of the council who attended the meeting. He requested the study team to introduce themselves. ▪ The attendance register was circulated and at the same time the chairperson recorded the names of those who attended.
2. Objectives of the meeting	▪ To introduce the project to Interested and Affected Parties (I&APs), in this case the Bakwena ba Mokgopa Traditional Authority who represented the community of the receiving environment ▪ To gather issues of concerns about the proposed development and the process being adopted by Envirolution Consulting in the consultation process
3. Agenda	There was no formal agenda for the meeting as the session was meant to present the project to different community representatives in the study area and allow open discussion of concerns from the community. The Public Participation team decided to follow the system that is used in this area when running meetings.
4. Study Process	Mr Solly Mohlala explained the consultation process and the technical studies being conducted. He also explained that there are alternative substation sites that were identified and how the technical studies were used to choose a preferred site for each substation.

5. Project Information	Mr Neo Masemola gave the motivation for the need of the project and the detailed description of the project. He explained the process that is followed in identifying alternative sites for a substation and alternative routes for a powerline. It was also explained that more houses are being developed in the area and therefore more reliable electricity supply is needed in the area hence the proposed project

QUESTION/ISSUE/COMMENT RAISED (*Not linked to specific individuals*)	**RESPONSE**
Bakwena ba Mokgopa Traditional Authority	
▪ In the presentation it is mentioned that two substations are being considered. Does this mean that two substations are going to be constructed in our area or two alternatives are being considered to decide on the position of one substation?	▪ Application for Environmental Authorisation has been made for two substations (one in Wesglas and one in Kgabalatsane). The maps show an alternative and a preferred location for each of the above.
▪ In building the new substation are you considering increasing the reliability of electricity supply in Kgabalatsane only or the project will also benefit other areas like Dipompong?	▪ The project as a whole is big and Eskom planned to develop it in stages. There are two substations to be constructed in the area (Wesglass and Kgabaletsane). For each substation alternative sites are investigated. Having two substations in the area will help in that if one substation experiences technical problems this will not affect the supply of electricity. Mr Masemola explained that the project introduced previously is a precursor to this one
▪ Presentation has just been done; does it mean the council is expected to give comment now?	▪ Mr Mohlala explained that a Draft Basic Assessment Report will be made available for public scrutiny. Forty days comment period will be allowed.
▪ Is this new project being planned because of the current load shedding incidences or it has always been in the plan of Eskom for the area?	▪ The project has been planned as part of the regional distributional network, and not due to the load shedding incidents
▪ The process of elucidating comments from the public by way of distributing reports at different strategic places is considered to be ineffective because very few people actually go out there to read these reports. The council proposes that a meeting be arranged where members of the community can be addressed by the study team	▪ A meeting will be considered, and the community will be informed via councillors. The IAPs that have been registered during the period after the project was announced, will receive invitations via e-mail

about the proposed project	and/or phone.
▪ The issue of how servitude is acquired and how compensation will be paid for must be explained to the community at large to eliminate all suspicions of mismanagement of the money paid for servitude acquisition	▪ The issue of land rights and acquisition will be explained at future discussions with land owners and IAPs.
▪ The project must be labor intensive so that local people can get some jobs	▪ Eskom has a policy of utilising local labour for certain aspects of the work, but much of the work requires advanced skills and machinery.
▪ What are the timeframes for the construction of this project	▪ At this stage Eskom is still negotiating for servitude for the first project. For now Eskom is estimating 2017 as the target date for construction of the second phase (Wesglass and Kgabalatsane)
▪ The project is welcomed but Eskom must first resolve the issue of unpaid servitudes for existing powerlines. Presentations on the outstanding payment have been made to Eskom but they are not being attended to.	▪ This issue falls outside the scope of this project, but the responsible representative at Eskom will investigate any such claims.
Meeting with Key Stakeholders from Ward 10 and 35 in Kgabalatsane	
▪ The attendees indicated that the project is welcomed and they wanted to know if the project will help Eskom to solve the electricity problem in the area.	▪ The offer is appreciated. Eskom is dedicated to improving service provision.
▪ The exact location of the substation was discussed as some members wanted clarification on the position of the substation	▪ The location was explained where the substation was going to be located.
▪ Attendees wanted to know about the timeframe of for construction	▪ It was explained that the expected date is late 2017.
▪ One member of the local community confirmed that the project has been explained to the public and generally the public welcomes the project	▪ The attitude is welcomed. Thank you.
Meeting with Councillor for Ward 36 in Klipgat (Clr. Raseroka)	
▪ The councillor explained that power cut was very frequent in December and it has been found that people from the surrounding squatter area were illegally tapping electricity from the paying. The councillor mentioned that the matter was reported and Eskom does not seem to take is serious.	▪ It was advised that such matters be reported to Eskom in Rustenburg

Attendance lists of community meetings on 23 April 2015

(1)

Envirolution CONSULTING
ENVIRONMENTAL ENGINEERING AND MANAGEMENT CONSULTING

ATTENDANCE REGISTER – 23 APRIL 2015 PUBLIC PARTICIPATION

Time:

Venue:

BASIC ASSESSMENT PROCESS FOR THE PROPOSED WESGLASS-KGABALATSANE SUBSTATIONS AND 132KV OVERHEAD LINES

NAME & SURNAME	ORGANISATION/GROUP	EMAIL	CELLPHONE	SIGNATURE
Solly Mohlala	Envirolution	mohlalass@telkomsa.net	0136561212	[signature]
Ziyanda Maqubela	Eskom	maqubezs@eskom.co.za	0724148843	[signature]
BA Mone	T/C	—	0786125499	[signature]
Gabriel Mogotsi	T/C		0722934262	[signature]
H.M. Maake	T/C		0712791115	[signature]
Obed D Pooe	BBMTC.	obedpooe@gmail.com	0660139927	[signature]
Dinatsotlhe Mamogale	BBMTC	charlemamogale@gmail.com	0716836496	[signature]
Marcus Maake	Cllr Madibeng	—	072 2771338	[signature]
Sipho Masina	Ward Cllr (35) Madibeng	—	0721382159	[signature]
Marinda le Roux	Envirolution	marinda@envirolution.co.za	0614174281	[signature]
Moses Mahlangu.	Envirolution	delmo@telkomsa.net	0825549558	[signature]
Lema Mamogale	BBM TC	N/A	0762681323	[signature]
Neo Masemola	Eskom	masemoan@eskom.co.za	0794120171	[signature]

Envirolution CONSULTING
ENVIRONMENTAL ENGINEERING AND MANAGEMENT CONSULTING

(2)

ATTENDANCE REGISTER – 23 APRIL 2015 PUBLIC PARTICIPATION

Time: 10:30

Venue: KGABALATSANE

BASIC ASSESSMENT PROCESS FOR THE PROPOSED WESGLASS-KGABALATSANE SUBSTATIONS AND 132KV OVERHEAD LINES

NAME & SURNAME	ORGANISATION/GROUP	EMAIL	CELLPHONE	SIGNATURE
Solly Mocela	Envirolution	mocela858@telkomsa.net	0136561212	
Marinda le Roux	Envirolution	marinda@envirolution.co.za	0614171081	
Mans Phasha	Eskom – Planning	phashamr@eskom.co.za	0715764457	
Lesego Mphahlele	Eskom – Planning	Mphahlpl@eskom.co.za	0792502764	
Charles Cwije	Eskom – NED	cwijec@eskom.co.za	082 570 1835	
Manus Maelute	Clr ward 10	—	078 277 1338	
Sipho Masina	Clr ward (35)	—	0721382159	
Lucky Mathibedi	Ward Comm 10	—	0731586011	
Reuben Ngwenya	Ward Comm. 10		0782885792	
Andrew Moeletsi	Ward Comm 10	—	0722696957	
Malobo Ramaeota	Ward-Com 10	—	0735935851	
Japhta Maphato. Pooe	NAZO - Comm. 10.		073 236 0849	
Ziyanda Maqubela	Eskom-Land & Rights	maqubezz@eskom.co.za	0724145483	
Neo Masemola	Eskom	masemoan@eskom.co.za	0794120171 011 711 2824	
Moses Mahlangu	Envirolution	dehoa@telkom.sa.net	0828578838	

Envirolution CONSULTING

ATTENDANCE REGISTER – 23 APRIL 2015 PUBLIC PARTICIPATION

Time: 12:00

Venue: Klipgat Community office

BASIC ASSESSMENT PROCESS FOR THE PROPOSED WESGLASS-KGABALATSANE SUBSTATIONS AND 132KV OVERHEAD LINES

NAME & SURNAME	ORGANISATION/GROUP	EMAIL	CELLPHONE	SIGNATURE
M le Roux	Envirolution	marinda@envirolution.co.za	—	[illegible]
Zuyanda Maquibela	Eskom	maquibezs@eskom.co.za	0114246556	[illegible]
Morris Maeluk	CLR ward 10	— — —	078 2771338	[illegible]
Solly Molulela	Environbaetetu	molulela@telkoms.net	0136561212	Molulela.
PO Maekoane	E Kleaw W/Room		0726 51657	[illegible]
Neo Masemola	Eskom	masemoan@eskom.co.za	0794207 71 011 711 2824	Masemola.

Appendix F: Impact Assessment

IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

- **Impact Assessment and Rating Methodology (The impact assessment methodology is attached as Appendix G2.)**

The significance of impacts will be rated from **Low, Medium** to **High** where:

Low: Little influence on the receiving environment
Medium: Will have an influence on the receiving environment unless mitigated
High: Will have an influence on the receiving environment regardless of mitigation
Positive: Impacts that will lead to an improvement in the status quo, e.g. improve electricity supply or protect the environment

Please also refer to the draft EMPr, Specialist assessment and Eskom's minimum standards for vegetation management and erosion control reports for details on other applicable mitigation measures

SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

3. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A(2) of this report.

- **Impact Assessment and Rating Methodology**

The significance of impacts will be rated from **Low, Medium** to **High** where:

Low: Little influence on the receiving environment
Medium: Will have an influence on the receiving environment unless mitigated
High: Will have an influence on the receiving environment regardless of mitigation
Positive: Impacts that will lead to an improvement in the status quo, e.g. improve electricity supply or protect the environment

Please also refer to the draft EMPr, Specialist assessment and Eskom's minimum standards for vegetation management and erosion control reports for details on other applicable mitigation measures

ASSESSMENT OF KGABALATSANE POWER LINES ROUTES (PREFERRED AND ALTERNATIVES)

Note - For the purposes of this assessment and clarification, the proposed **power line routes for Kgabalatsane **and alternatives** located to the north of Rabokala (on Portion 1 of the farm Oskraal 248 JQ & Remainder of farm Tyne 250JQ) will be **assessed collectively** as these follow a similar geographical environment. Impacts from the abovementioned powerlines are likely to be similar.* **Notes will be made should significant differences between sites or alternatives occur, to indicate if and why a particular alternative is perceived to be less favourable than another**.

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
CONSTRUCTION PHASE IMPACTS				
Impact on Fauna ***similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments***	***Direct impacts:*** • Loss of faunal habitat / Fragmentation from the clearing of vegetation communities for construction of the associated powerline infrastructure and servitude • Faunal Disturbance from construction activities i.e. noise • Killing and snaring of fauna species may occur from construction personnel •	High	• Only areas where construction is to occur should be cleared of vegetation; • No natural watercourses, pans, or wetlands should be disturbed by the development with a 500m buffer zone (marked during the construction phase) allowed for between the edge of any of the above mentioned features or an appropriate buffer zone as determined by a wetland specialist; • The extent of the construction should be confined to disturbed areas or those identified as having a low / medium ecological sensitivity and demarcated. • Where areas of high ecological sensitivity need to be disturbed, the necessary permits and mitigation measures recommended by the wetland specialist should be implemented. • No construction vehicles or personnel should be allowed to leave the demarcated area unless authorised to do so • Areas identified with high ecological sensitivity should be avoided during construction activities. • Areas that are not part of the site development plan should be marked as no-go zones;	**Medium**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			• The development should promote connectivity between ecologically important habitats by retaining natural corridors for the movement of fauna; • Roads should be planned to encourage faunal dispersal and minimize fragmentation of ecologically sensitive areas. Roads should preferably be maintained as gravel tracks; • Construction activities should be limited to daylight hours; and • Construction vehicles transporting materials to and from the construction site must be covered to reduce the formation of dust. • Construction personnel should be informed of the Animal Protection Act no. 71 of 1962 and encouraged not to harm any wildlife; and • Construction personnel should undergo awareness training regarding fauna assemblages and the correct procedures to follow should fauna be found within the site. They should be encouraged not to harm any wildlife. They should also be informed of any policies and procedures applicable for fauna and the environment. • Construction activities of the proposed power line and substation should be restricted to daylight hours reducing the potential impact on the nocturnal breeding activities of the majority of amphibian species. The Giant Bullfrog however breeds during the day; • Ideally the installation of the new pylons should be undertaken during the dry winter months (May-September) when the majority of amphibian species are dormant; • Activities around the seasonal streams and dongas must be strictly limited to the 8m servitude; • No Giant Bullfrogs may be collected for food or illegal pet trade; • As a precautionary mitigation measure it is recommended that the developer and construction contractor as well as an independent environmental control officer (ECO) should be made aware of the possible presence of certain threatened amphibian species such as the Giant Bullfrog. • Reptile management recommendations: No further rock removal	

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			should occur adjacent to the new pylons; • no termite mounds should be intentionally destroyed. If any moribund termite mounds have to be destroyed due to tower position a qualified herpetologist must be present in case any blind snakes are unearthed. The termite mounds should be carefully excavated by hand and pick; • Any animals rescued or recovered will be relocated in suitable habitat away from the pylon and line; • Trees including stumps; bark and holes in trees are vital habitats for numerous arboreal reptiles (chameleons, snakes, agamas, geckos and monitors); • The removal of indigenous tree species as well as vegetation clearance must be kept to the minimum area required and remain in the existing servitude wherever possible. This is especially pertinent for the riparian vegetation along the rivers; • Cleared vegetation should form wood piles and logs and stumps within the cleared servitude. Dead or decaying wood piles should be created as these will provide valuable refuge areas especially due to the clearance of vegetation cover. Logs and stumps also provide important habitats for several reptile species as well as smaller mammals, amphibians, arachnids and scorpions. With time they will eventually be reduced to valuable compost by several animal species. Dead trees and stumps will also be used for nesting purposes by barbets, hoopoes, owls, hornbills as well as perching or hunting platforms for birds like the kingfisher; • Any lizards, gecko's, agamids, monitors or snakes encountered should be allowed to escape to suitable habitat away from the disturbance. No reptile should be intentionally killed, caught or collected during any phase of the project; • Several venomous snake species occur along the study area including Rinkhals (Haemachatus haemachatus), Snouted Cobra (Naja annulifera), Mozambique Spitting Cobra (Naja mossambica), Common or Rhombic Night Adder (Causus rhombeatus), Puff	

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			Adder (Bitis arietans); General avoidance of snakes if the best policy if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area; Appropriate foot wear (sturdy leather boots) should be worn in the field	
Impacts on Avifauna ***similar for Alt 1 Alt 2 and Alt3 alternatives. Very few species were identified that could be impacted upon***	*Direct impacts:* Displacement due to habitat destruction and disturbance	Low	• Restrict the construction activities to the construction footprint area. • Avoid the removal of large trees.	**Low**
	Collisions with the earth wire of the proposed 132kV line - the greatest risk of collisions power lines.	Medium	• The spans that cross drainage lines and wetland areas should be marked with **Bird Flight Diverters** on the earth wire of the line, five metres apart, alternating black and white • Identified high risk sections of the power line to be installed with a suitable anti bird collision marking device approved by Eskom, and as per Eskom standards. • Bird flight diverters shall be ideally be installed along the stream crossings to reduce collision with the new upgraded transmission line and towers; • Several large bird species have been recorded in the area including three species of vulture (White-backed, Cape and Lappet-faced), Martial Eagle, Secretary birds, Yellow- Billed and Black Stork.	**Low**
	Electrocutions - Raptors and vultures that may occasionally forage in the study area	Medium	The poles should be fitted with bird perches on top of the poles to draw birds, particularly vultures, away from the potentially risky insulators	**Low**
	Indirect impacts None identified	N/A	N/A	**N/A**
	Cumulative impacts None identified	N/A	N/A	**N/A**
Impacts on Flora ***similar for Alt 1 Alt 2 and Alt3 alternatives***	• Impact on riparian and areas, as well as natural bushveld	Medium	• The route alignments must be fixed through areas with the least vegetation sensitivity. • A temporary fence or demarcation must be erected around the construction area (include the servitude, construction camps, areas	**Low**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
due to similar environments and disturbed nature of the surrounding land			where material is stored and the actual footprint of the development) to prevent access to sensitive environs. • Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area. • No open fires are permitted within naturally vegetated areas. • Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas. • A vegetation rehabilitation plan should be implemented. Grass can be removed as sods and stored within transformed vegetation – remove alien invasive vegetation prior to storing grasslands sods in transformed areas. Smaller shrubs and bulbs should also be removed and used for rehabilitation. The plants must preferably be removed during the winter months and be replanted by latest springtime. The grass sods should not be stacked on top of each other. Once construction is completed, these sods should be used to rehabilitate the disturbed areas from where they have been removed. In the absence of timely rainfall, the sods should be watered well after planting and at least twice more over the next 2 weeks. • Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority. • No activities should take place during rainy events and at least 2 days afterwards.	**Low**
Similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments and disturbance of plants in all areas.	Possible destruction of plants of conservation concern and protected tree species		• Prior to construction, the final route alignment should preferably be walked by a specialist to identify any possible plant species of conservation concern as well as protected tree species. Note that this should be done in the growing season of plants (Oct-March). • Although the secondary bushveld is regarded by this report as posing low constraint to the proposed powerline development, development should proceed with caution and it is advised that the final route alignment be walked by an ecologist or botanist and	**Low**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			these plants removed and conserved if found to be within the development footprint. • Protected tree species was confirmed within the secondary bushveld. • The protected tree species along the powerline routes and within the substation footprint should preferably not be removed and only pruned where necessary. Note that removal and pruning will require a permit from the Department of Agriculture, Forestry and Fisheries (DAFF). • Implement a Plant Rescue and Rehabilitation Plan: Where the plants of conservation concern are deemed to be under threat from the construction activity, the plants should be removed by a suitably qualified specialist and replanted as part of vegetation rehabilitation after the construction. • Construction workers may not tamper or remove these plants and neither may anyone collect seed from the plants without permission from the local authority. • Cordon off the sensitive vegetation that house the protected plant species and the plants of conservation concern and protect from construction activities and vehicles • a walk down of the selected route must take place by a plant ecologist or botanist before the most suitable route is finally surveyed for construction purposes. This is to mark and GPS those individuals of the protected tree species [*Marula (Sclerocarrya birrea*, Ironwood (*Combretum imberbe*) and Shepherd's Tree (*Boscia albitrunca*)]. This is important for permit purposes as well as to damage or out the least number of these protected trees; • A search and rescue operation must be done before construction commences in order to translocate the any bulbous and succulent plant that could be negatively affected by this proposed development; • In terms of the Forest Act (Act 84 of 1998) permits for the removal or pruning of these abovementioned protected species must be obtained.	

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments	***Indirect impacts:*** Spread of alien invasive vegetation	Medium	• Alien invasive species that were identified within the study area and in specific along the final route alignment should be removed prior to construction-related soil disturbances. • Compile and implement an alien invasive monitoring plan to remove alien invasive plant species along the chosen route alignments, prior to construction. • By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation. • All alien seedlings and saplings must be removed as they become evident for the duration of construction. • Manual / mechanical removal is preferred to chemical control. • All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the construction areas. This should be verified by the ECO.	**Low**
	Cumulative impacts None identified	N/A	N/A	**N/A**
	Indirect impacts: Alteration of water quality – increasing the amounts of nutrients (phosphate, nitrite, nitrate) through disposal or discharge of human (including partially treated and untreated) sewage during the construction phase of the development	Medium	• Provision of adequate sanitation facilities located outside of the wetland/riparian area or its associated buffer zone • Establishment of buffer zones to reduce nutrient inputs in diffuse flow • Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation.	**Medium**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
	Alteration of water quality – toxic contaminants (including toxic metal ions (e.g. copper, lead, zinc) and hydrocarbons and discharge of solvents, and other industrial chemicals	Medium	• After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land shall be left in a condition as close as possible to that prior to use. • Ensure that maintenance work does not take place haphazardly, but, according to a fixed plan, from one area to the other. • Maintenance of construction vehicles • Control of waste discharges • Guidelines for implementing Clean Technologies • Maintenance of buffer zones to trap sediments with associated toxins	**Medium**
	Cumulative impacts: Changing the amount of sediment entering water resource and associated change in turbidity (increasing or decreasing the amount) through earthwork activities, vegetation clearing, disturbance of soil and slopes through creation of roads and tracts, changes and run off characteristics and erosion	High	• Construction in and around watercourses must be restricted to the dryer winter months. • A temporary fence or demarcation must be erected around the works area to prevent water runoff and erosion of the disturbed or heaped soils into wetland areas. • Access roads and bridges should span the wetland area, without impacting on the permanent or seasonal zones. • Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas. • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005). • A vegetation rehabilitation plan should be implemented. • Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. • Rehabilitation plans must be submitted and approved for rehabilitation of damage during construction and that plan must be implemented immediately upon completion of construction. • Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular and pedestrian access.	**High**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			• Ideally, the rehabilitated construction footprints, especially on slopes and along riparian and wetland areas, must be fenced to prevent pedestrian access and trampling. Once rehabilitation was observed to be successful during monitoring, the fenced may be removed (at least two years). • During the construction phase measures must be put in place to control the flow of excess water so that it does not impact on the surface vegetation. • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas. • Runoff from roads must be managed to avoid erosion and pollution problems. • Implementation of best management practices Source-directed controls • Buffer zones to trap sediments	
	Changing the physical structure within a water resource (habitat) through encroachment to achieve maximum commercial returns, deposition of wind-blown sand and loss of fringing vegetation and erosion	High	• Other than approved and authorized structure, no other development or maintenance infrastructure is allowed within the delineated wetland and riparian areas or their associated buffer zones. • Demarcate the wetlands and riparian areas and buffer zones to limit disturbance, clearly mark these areas as no-go areas • Linear developments (e.g. roads) should span the watercourse • Weed control in buffer zone • Monitor rehabilitation and the occurrence of erosion twice during the rainy season for at least two years and take immediate corrective action where needed. • Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance of the powerline and take immediate corrective action where invasive species are observed to establish.	**Medium**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
Impacts on Heritage Resources ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments nature of findings by the Heritage specialist***	***Direct impacts:*** **Impacts on graves** - The proposed study area has a number of burial places ranging from a large formal cemetery, to individual graves located in the vicinity of abandoned homesteads.	High	All the identified burial places are well demarcated and visible and would therefore be easily avoided. The power lines are routed to by-pass the various burial places and that they are demarcated with danger tape for the duration of the power line construction.	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Visual Impacts ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments – away from residential areas***	***Direct impacts:*** • Removal of vegetation from construction activities • Construction of new access roads • Construction of camps and work force All these activities will impact on the visual value and quality of the landscape character especially in the areas that are considered natural.	Medium	• Locate construction camps and stock yards in the least visible areas or locate it on areas that are already disturbed such as agricultural fields for example; The screening capacity of the site can be temporarily enhanced through the erection of a 3 m high shade cloth fence around the construction camp and substation site during construction. The colour of the shade cloth should be similar to that of the adjacent vegetation, i.e. a light brown or khaki green; • Keep the construction camp and construction area neat and tidy at all times. Remove any waste products from the site or contain it in an enclosed area out of sight from viewers; • Establish limits of disturbances during construction through the demarcating of the construction areas to prevent unnecessary damage to vegetation; • Keep to existing road infrastructure as far as possible to minimise the physical damage to vegetation in the power line servitude; and • Implement rehabilitation of disturbed areas as soon as possible to limit the duration of exposed surfaces. • Minimise unsightly cut- and fill areas by stepping the substation building platform and thereby lowering the structure by as much as possible;	**Low**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			• Shape the cut and fill embankments by rounding the edges and giving it a more natural appearance if space permits. Alternatively, embankments must be stabilised preferably through planting (unlikely to be an option inside the substation boundary fence due to safety consideration) to cover up any exposed soil and to restrict erosion; • Establish screening planting along the sides of the substations that front towards the communities. Alternatively it should be relocated to a site that has a natural screening capacity; • Signage should be simple and unobtrusive and not protrude above the skyline when • viewed from any direction; and • A definite effort should be made to reduce the height and scale of the substations, if at all possible.	
Geotechnical Impacts ***The desk top study did not show significant differences in geotechnical conditions for the alternatives but detail investigations of pylon positions need to be undertaken once a route has been approved.***	***Direct impacts:*** Soil disturbance during construction at the pylon sites which may destabilise the soil and lead to soil erosion	High	• Use of berms and drainage channels to direct water away from the construction areas where necessary • Use existing access roads wherever possible • Rehabilitate disturbed areas as soon as possible after construction • Correct engineering design of stream and water course crossings • Correct engineering design of any new access roads	**Medium -low**
	The possible presence of shallow rock (granite, granophyre & gabbro) or hardpan calcrete (within 1,5m of surface) could result in areas of difficult excavation, NHBRC class R.	Medium	• Steep slopes (>45°) and areas immediately below them should be avoided for the siting of pylons and maintenance roads wherever possible. These areas are subject to slope failure and are vulnerable to erosion.	**Low**
	Shallow perched water table could saturate foundation soils and have a detrimental effect on bearing capacity at the	Medium	• Floodplains and areas in close proximity to rivers need to be avoided. • No pylons should be placed in or close to pans, vlei areas and wetlands.	**Low**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
	substation sites.			
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: *None identified*	N/A	N/A	**N/A**
Dust Impacts ***The dust impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments (relatively far away from residential areas)***	***Direct impacts:*** Construction machinery and heavy vehicles which are likely to make use of the existing local oads to transport equipment and material to the construction site, are likely to generate dust. However, the proposed power line is located away from residential areas and only a low nuisance factor is expected.	Low	• Continuous watering of the site should be carried out to prevent dust pollution during windy and dry conditions. • A continuous dust monitoring process needs to be undertaken during construction. • Speed restriction of 20km/h must be implemented for all construction vehicles. • All vehicles transporting friable materials such a sand, rubble etc must be covered by a tarpaulin or wet down. • Construction work to be undertaken during weekdays as far as practical.	**Low**
	Indirect impacts: None identified.	N/A	N/A	**N/A**
	Cumulative impacts: None identified.	N/A	N/A	**N/A**
Spillage of hazardous substances ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives***	***Direct impacts*** Several activities can cause the spillage of hazardous substances, causing contamination of receiving environment at the construction site. These include spillages from unmanaged ablution facilities, spillages of fuels and oils, spillage of concrete and cement	Medium	*Store fuels and chemicals in a bunded area. Provide staff with hazardous materials training.*	**Low**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
	and runoff of contaminated cement wastewater.			
	Indirect impacts None identified	N/A	N/A	**N/A**
	Cumulative impacts None identified	N/A	N/A	**N/A**
Fires ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives***	***Direct impacts*** Fires may be caused through a number of actions or reasons, such as defective equipment, cigarette butts, and spilled fuels and oils. Fires are generally the result of bad or ineffective management, or negligence.	Medium	Fire fighting equipment to be kept on site and serviced regularly.	**Low**
	Indirect impacts None identified	N/A	N/A	**N/A**
	Cumulative impacts None identified	N/A	N/A	**N/A**
Impact on socio-economics ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives due to similar socio-ecomomic situation for all these locations.***	***Direct impacts:*** Impact on nearby residential areas - Influx of workers in the area may raise concerns from neighbouring residents	Medium	• All adjacent landowners must be informed of the construction processes prior to commencement of construction activities. • Adjacent land owners must be informed timeously of any service stoppages in their areas. • Notification must include possible timeframes for stoppages. • Consequences of such stoppages must be clearly indicated to all surrounding/affected land owners. • Affected land owners must be timeously informed of any/all maintenance of the bulk water services supply which may result in service stoppages to their properties. Again this must include possible timeframes so alternatives can be provided.	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
Impacts on traffic and local roads ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives***	***Direct impacts:*** Traffic could be congested as a result of construction activities. In addition, traffic increase can lead to road damage, erosion, accidents and even traffic delays Construction machinery and heavy vehicles are likely to generate dust which is likely to be perceptible by adjacent residents. Trucks may potentially distribute dust along internal access roads.		• Vehicular movement beyond the property boundaries may not occur during peak hour traffic times (07h30 – 08h30 and 16h00 – 17h00). • It must be ensured that a backlog of traffic does not develop at the access points during peak hours through the upgrade to the road system and the implementation of an efficient and effective access control system. • Speed restriction of 20km/h must be implemented for all construction vehicles. • Implement dust suppression measures (wetting or application of soil binding compound) in all areas that will be affected by construction • activities and where dust will be generated	**low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
	Indirect impacts: Indirect employment through demand for construction materials, and support services, as well as empowerment and skills transfer opportunities.	Medium	No mitigation measure required (positive impact)	**Medium Positive impact**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Impact on infrastructure services ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives***	***Direct impacts:*** The status of the infrastructure services may be impacted on through the establishment of the site and the construction of roads.		**There are no mitigation measures as the impact is positive.** • The status of the infrastructure services in the surrounding area will be improved through the establishment of the site and the upgrade of roads in the area. • Insect the site for burst, blocked or leaking water pipe • During the operational phase, the sewage system must be inspected for leakages on regular basis and any leakages must be attended to immediately.	**Medium Positive Impact**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Increased soil erosion ***The impacts would be similar for Alt 1 Alt 2 alternatives but more pronounced for Alternative 3 where erosion dongas have already formed.***	Loss of fertile topsoil will occur due to the initial vegetation clearing (for access roads to tower sites); and construction earthworks may cause increased soil erosion as well as stormwater runoff.		• The route deviations impacting mostly on disturbed areas should be considered • It is recommended that care should be taken when constructing a power line as this might result in soil erosion. If at all possible, construction activities should preferably take place during the dry winter months. • Stockpiles in excavated areas should not be higher than 2 m to avoid compaction and visual impacts. • To prevent erosion of materials stockpiled for a long period of time, the material must be retained in a bermed area. • Do not allow erosion to develop on a large scale before taking action. • Make use of existing roads and tracks where feasible, rather than creating new routes through grassland areas. • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005). • Runoff from roads must be managed to avoid erosion and pollution problems. • Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. The grassland can be removed as sods and re-established after construction is completed. • Colonisation of the disturbed areas by plants species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study area. • Protect all areas susceptible to erosion and ensure that there is no	**Medium**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.	
Health and safety impacts ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments***	***Direct impacts:*** Impacts/injuries to animals or humans entering the site unnoticed	Medium	• The construction site and tower excavations must be fenced off and demarcated using danger tape to ensure that no animals or residents enter the area. • No fires are allowed at or around the construction site. • The contractor must provide gas fired stoves and heaters to the workers • Due to the reason that the number of population in the receiving environment will increase, it is therefore important to develop and implement Health Awareness programs to reduce the wide spread of diseases such as HIV/AIDS as well as educating people on issues related to safe sex. • Since the majority of the households in the area lack formal basic infrastructures for sanitation (flush toilets), it will also be advisable to provide mobile toilets to avoid contamination of land and surface water (e.g. rivers, springs and wetlands), as well as providing safe drinking water to reduce the consumption of contaminated water from streams/rivers or boreholes.	**Low**
	Workforce and construction sites	Medium	• Ensure all construction vehicles and machinery is under the control of competent personnel. • Limit access to the construction site to the workforce only. • Safety clothes and equipment must be worn at all times. • Comply with the requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Waste Management impacts ***The impacts would***	***Direct impacts:*** Improper storage and disposal of solid waste, littering and ablution facilities	Medium	• All solid waste generated during the construction process must be placed in a designated waste collection area within the construction camp and must not be allowed to blow around the site, be accessible to animals, or be placed in piles adjacent the waste	**Low**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
be similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments			skips / bins. • All solid waste must then be disposed of at the nearest licensed landfill and safe disposal certificates obtained. • Separate waste skips/ bins for the different waste streams must be available on site. The waste containers must be appropriate to the waste type contained therein and where necessary should be lined and covered. This will be managed through the site specific EMPr and monitored by the ECO. • Littering will not be permitted on the site and general housekeeping will be enforced. • General waste bins must be readily available for litter disposal and general housekeeping. The EMPr must be followed during construction. • All excess material and rubble must be removed from the site so not to restrict the rehabilitation process. • Adequate toilet facilities must be provided for all staff members as standard construction practice. • Chemical toilets must be placed within the construction camp and not in close proximity to the river. The chemical toilets to be provided must be from a registered company and all sewage must be disposed of at an appropriate facility. Safe disposal certificates must be kept on record. • No wastes may remain on the construction site for more than two weeks • Keep the properties neat and litter free at all times and maintain the landscaped areas.	
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Impacts on ground water	***Direct impacts:*** Groundwater contamination - Hydrocarbon leakages from	Medium	• Construction vehicles are to be maintained in good working order, to reduce the probability of leakage of fuels and lubricants. • All cement mixing must occur on impervious surfaces and within	**Low**

PROPOSED KGABALATSANE POWER LINE ROUTES – ALL 3 ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments	plant vehicles and poor management of sources of hydrocarbon leakages has a potential to pollute underground and surrounding resources		controlled bermed areas. • Oil residue must be treated with oil absorbent such as Drizit or similar and this material removed to a licensed waste disposal site. • Contractor/s must provide regularly serviced portable chemical toilets for construction workers at a distance no more than 200 m from the place of construction. • No materials may be discharged from the construction camps.	
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Noise Impacts ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments, and location away from residential areas***	***Direct impacts:*** Vehicles transporting materials to and from the site will potentially cause an additional noise burden to adjacent residents as well as along internal access roads.	Medium	• The contractor must ensure that noise levels remain within acceptable limits • Construction activities must be limited to normal working hours and according to municipal bylaws, i.e. working hours must be limited to weekdays as far as possible. • If construction is required on the weekend; permission from adjacent landowners will be required prior to construction.	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Impacts on stormwater ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives due to similar environments and conditions.***	***Direct impacts:*** The accumulation of stormwater.	Medium	• No stockpiles or construction materials may be stored or placed within any drainage line that may be in close proximity of storm water drains. • No stockpiles or construction materials may be stored or placed in close proximity to storm water drains. • The storm water system especially discharge points must be inspected and damaged areas must be repaired if required.	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**

OPERATIONAL PHASE IMPACTS				
PROPOSED KGABALATSANE POWER LINE ROUTES (PREFERRED AND ALTERNATIVES)				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation:**
Impacts on Flora ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives because the floral environments are similar.***	***Direct impacts:*** *Positive* impact by removing alien invasive plants, although care must be taken not to remove all vegetation at once, especially within the rainy season (could result in soil erosion and soil loss).	Medium	• Rehabilitate all areas cleared of invasive plants as soon as practically possible, utilising specified methods and species. • Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge. Monitoring should continue for at least two years after construction is complete. • Follow manufacturer's instruction when using chemical methods, especially in terms of quantities, time of application etc. • Ensure that only properly trained people handle and make use of chemicals. • Dispose of the eradicated plant material at an approved solid waste disposal site. • Only indigenous plant species naturally occurring in the area should be used during the rehabilitation of the areas affected by the construction activities.	**Low**
	Destruction of natural vegetation	Medium	• After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction. • Ensure that maintenance work does not take place haphazardly, but according to a fixed plan. • Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. • Delay the re-introduction of livestock (where applicable) to all rehabilitation areas until an acceptable level of re-vegetation has been reached. • Maintenance workers may not trample natural vegetation and work	**Low**

OPERATIONAL PHASE IMPACTS				
PROPOSED KGABALATSANE POWER LINE ROUTES (PREFERRED AND ALTERNATIVES)				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation:**
			should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to. • Plants that are not interfering with the operation of the powerline during the maintenance must not be disturbed.	
	Indirect impacts: Bush encroachment	Medium	• Use grass sods that were removed prior to construction to rehabilitate the construction footprints. Sods must not be stored for lengthy periods and should not be stacked on top of each other or on top of grazed and moist grasslands. The sods should preferably be removed during the winter months and replanted by springtime latest. • Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access. • Delay the re-introduction of livestock (where applicable) to all rehabilitation areas until an acceptable level of re-vegetation has been reached. • Remove excess *Acacia karoo*, *A melifera* and *Dichrostachys cinerea* seedlings along with any alien vegetation. • Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.	**Low**
	Cumulative impacts:	N/A	N/A	**N/A**
Disruption to local residents ***The impacts would be similar for Alt 1***	***Direct impacts:*** Power cuts during maintenance may disrupt local people	Medium	Inform residents if planned power cuts at least 15 -30 days before implementing	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**

OPERATIONAL PHASE IMPACTS				
PROPOSED KGABALATSANE POWER LINE ROUTES (PREFERRED AND ALTERNATIVES)				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation:**
Alt 2 and Alt3 alternatives	***Cumulative impacts:*** None identified	N/A	N/A	**N/A**
Impacts on Fauna ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives***	***Direct impacts:*** Faunal Disturbance - During the operational phase the mammal assemblages will be minimally disturbed by the functioning of the powerline and occasionally disturbed should maintenance of the infrastructure be required. It is not expected for the composition of fauna species to alter and the distribution and abundance of the faunal species should revert to that similar of the composition before construction. This impact will be on a limited basis dependent on the need for maintenance.	Medium	• Areas not impacted by the associated infrastructure, as well as those considered to have a high biological diversity, should be maintained in their present states; • Maintenance activities should be limited to daylight hours and vehicles should remain on the designated roads at all times; and • The road network should be maintained as gravel tracks that allow for faunal dispersal.	**Low**
	Indirect impacts: Local Business growth	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Impacts on Socioeconomic ***The impacts would be similar for Alt 1 Alt 2 and Alt3 alternatives***	***Direct impacts:*** Job creation during maintenance	Low	• Jobs will be available to skilled workers and not many local job seekers will benefit from the maintenance works. • preference could be given to local SMMEs where possible for tasks such as Clearing of vegetation	**Low Positive Impact**
	Indirect impacts: Local Business growth	Medium	No mitigation measures are recommended.	**Medium Positive impact**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Visual Impacts	***Direct Impacts:***	Low in areas	• Previously rehabilitated areas must be monitored to prevent the	**Medium**

OPERATIONAL PHASE IMPACTS				
PROPOSED KGABALATSANE POWER LINE ROUTES (PREFERRED AND ALTERNATIVES)				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation:**
	Aesthetic quality and sense of place: The operation of the new power line and substations will cause intrusions on observers' views especially on those residents living within 1 km of the servitude. This will result from the introduction of new elements that are uncharacteristic of the study area and will alter the baseline condition to the visual environment. The industrial character of the power lines and substation will contrast severely with the rural and natural character of the landscape. These will be representative of anthropogenic alternations to a study area that is expected to impact on the value of the visual environment.	without residential component High when close to residential areas	infestation of weeds that may become an unsightly feature. • Maintenance of the servitude in terms of clearing up littering and dumped refuse is highly recommended. This must be done on a routine basis in order to keep the servitude neat and maintain a visually unobtrusive condition; • All lighting, especially perimeter security lighting at the substations must be shielded to minimise light spillage and pollution. No direct light sources must be seen from outside the site; • Previously rehabilitated areas must be monitored to prevent the infestation of alien vegetation species that may become an unsightly feature; and • Screen planting that was specifically established to minimise the intrusiveness of the power line or substation must be maintained and dead or sick plants replaced for a determinate period after construction.	
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Soil erosion ***The impacts would be similar for Alt 1 Alt 2 but more pronounced for the Alternatives 3 thata is located in an area where erosion dongas already***	***Direct impacts:*** **Storm water runoff may cause soil erosion from the tower foundations**	Medium	• Regularly inspect all storm water channels • Provide soil conservation measures in areas of susceptible erosion around the tower foundations	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: The cumulative impact would be an increase in erosion and loss of topsoil. Erosion dongas will form more easily, creating areas that are dangerous to	N/A	N/A	**N/A**

OPERATIONAL PHASE IMPACTS				
PROPOSED KGABALATSANE POWER LINE ROUTES (PREFERRED AND ALTERNATIVES)				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation:**
exists	live stock and residents.			

ASSESSMENT OF KGABALATSANE SUBSTATION (PREFERRED ALTERNATIVE 1 & ALTERNATIVE 2)

Note - For the purposes of this assessment and clarification, the proposed **SUBSTATIONS for Kgabalatsane **and alternatives** will be **assessed collectively** as these follow a similar geographical environment. Impacts from the abovementioned substations are likely to be similar.* **Notes will be made should significant differences between sites or alternatives occur, to indicate if and why a particular alternative is perceived to be less favourable**.

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
CONSTRUCTION PHASE				
Impact on Fauna	***Direct impacts:*** • Loss of faunal habitat / Fragmentation from the clearing of vegetation communities for construction of the associated powerline infrastructure and servitude • Faunal Disturbance from construction activities. i.e. noise • Killing and snaring of	High	• Only areas where construction is to occur should be cleared of vegetation; • No natural watercourses, pans, or wetlands should be disturbed by the development with a 500m buffer zone (marked during the construction phase) allowed for between the edge of any of the above mentioned features or an appropriate buffer zone as determined by a wetland specialist; • The extent of the construction should be confined to disturbed areas or those identified as having a low / medium ecological sensitivity and demarcated. • Where areas of high ecological sensitivity need to be disturbed, the necessary permits and mitigation measures recommended by the wetland specialist should be implemented.	Medium

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
	fauna species may occur from construction personnel ***Impacts for both alternatives regarding fauna are likely to be similar due to similar environments***		• No construction vehicles or personnel should be allowed to leave the demarcated area unless authorised to do so • Areas identified with high ecological sensitivity should be avoided during construction activities. • Areas that are not part of the site development plan should be marked as no-go zones; • The development should promote connectivity between ecologically important habitats by retaining natural corridors for the movement of fauna; • Roads should be planned to encourage faunal dispersal and minimize fragmentation of ecologically sensitive areas. Roads should preferably be maintained as gravel tracks; • Construction activities should be limited to daylight hours; and • Construction vehicles transporting materials to and from the construction site must be covered to reduce the formation of dust. • Construction personnel should be informed of the Animal Protection Act no. 71 of 1962 and encouraged not to harm any wildlife; and • Construction personnel should undergo awareness training regarding fauna assemblages and the correct procedures to follow should fauna be found within the site. They should be encouraged • not to harm any wildlife. They should also be informed of any policies and procedures applicable for fauna and the environment.	
Impacts on Avifauna **Both Alternatives** are located in the savanna biome. Hoever, the majority of species recorded during the field survey are common, widespread and typical bushveld	*Direct impacts:* Displacement due to habitat destruction and disturbance	Low	Restrict the construction activities to the construction footprint area. Avoid the removal of large trees.	**Low**
	Electrocutions - Raptors and vultures that may occasionally forage in the study area	Medium	The poles should be fitted with bird perches on top of the poles to draw birds, particularly vultures, away from the potentially risky insulators	**Low**
	Indirect impacts None identified	N/A	N/A	**N/A**
	Cumulative impacts	N/A	N/A	**N/A**

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
species ***Impacts for both alternatives regarding avifauna are likely to be similar due to similar environments***	None identified			
Impacts on Flora The study area falls within the **Savanna Biome** and classified as belonging to the Marikana Thornveld (SVcb6)	Proposed preferred <u>Alternative 1 substation:</u> • The area surrounding the site comprises of secondary Bushveld with a number of current disturbances. • Vegetation is Disturbed (grazed and trampled) <u>Alternative 2 substation</u> site: • Comprised of secondary Bushveld with current disturbances. • Vegetation is largely disturbed (grazed and trampled) • No red data species were found Protected trees <u>along the Alternative 1, 2 and 3 power line routes</u> were identified: Marula (Sclerocarrya birrea), Ironwood (Combretum imberbe) and Shepherd's Tree (Boscia albitrunca) , *Faurea saligna.*	Medium	• The placing of the substation and associated structures must be fixed in areas with the least vegetation sensitivity. • A temporary fence or demarcation must be erected around the construction area (include the servitude, construction camps, areas where material is stored and the actual footprint of the development) to prevent access to sensitive environs. • Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area. • No open fires are permitted within naturally vegetated areas. • Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas. • A vegetation rehabilitation plan should be implemented. Grass can be removed as sods and stored within transformed vegetation – remove alien invasive vegetation prior to storing grasslands sods in transformed areas. Smaller shrubs and bulbs should also be removed and used for rehabilitation. The plants must preferably be removed during the winter months and be replanted by latest springtime. The grass sods should not be stacked on top of each other. Once construction is completed, these sods should be used to rehabilitate the disturbed areas from where they have been removed. In the absence of timely rainfall, the sods should be watered well after planting and at least twice more over the next 2 weeks. • Construction workers may not remove flora and neither may anyone collect seed from the plants without permission from the local authority.	**Low**

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			• No activities should take place during rainy events and at least 2 days afterwards.	
	Possible destruction of plants of conservation concern and protected tree species (Both Site Alternatives) .		• Note that removal and pruning of protected species will require a permit from the Department of Agriculture, Forestry and Fisheries (DAFF). • Implement a Plant Rescue and Rehabilitation Plan: Where the plants of conservation concern are deemed to be under threat from the construction activity, the plants should be removed by a suitably qualified specialist and replanted as part of vegetation rehabilitation after the construction. • Construction workers may not tamper or remove these plants and neither may anyone collect seed from the plants without permission from the local authority. • Cordon off the sensitive vegetation that house the protected plant species and the plants of conservation concern and protect from construction activities and vehicles.	Low
	Indirect impacts: Spread of alien invasive vegetation	Medium	• Alien invasive species that were identified within the study area and in specific along the final route alignment should be removed prior to construction-related soil disturbances. • Compile and implement an alien invasive monitoring plan to remove alien invasive plant species along the chosen route alignments, prior to construction. • By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation. • All alien seedlings and saplings must be removed as they become evident for the duration of construction. • Manual / mechanical removal is preferred to chemical control. • All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the construction areas. This should be verified by the ECO.	Low

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
	Cumulative impacts None identified	N/A	N/A	N/A
	Cumulative impacts: *– no wetlands were identified on the sites* ***for either Alternative 1 or 2***	N/A	N/A	N/A
Impacts on Heritage Resources	***Direct impacts:*** **Impacts on graves** – No graves were found **on** either **Alternative 1 or Alternative 2 substation sites.**	None	None	**None**
	Homesteads - none are located **on** Alternative **1 or Alternative 2 substation sites**	None	None	**None**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Visual Impacts ***Visual Impacts for both alternatives are likely to be similar due to similar environments (away from residential areas)***	***Direct impacts:*** Both sites • Removal of vegetation from construction activities • Construction of new access road • Construction of camps and work force All these activities will impact on the visual value and quality of the landscape character especially in the areas that are considered natural.	Medium	• Locate construction camps and stock yards in the least visible areas or locate it on areas that are already disturbed such as agricultural fields for example; The screening capacity of the site can be temporarily enhanced through the erection of a 3 m high shade cloth fence around the construction camp and substation site during construction. The colour of the shade cloth should be similar to that of the adjacent vegetation, i.e. a light brown or khaki green; • Keep the construction camp and construction area neat and tidy at all times. Remove any waste products from the site or contain it in an enclosed area out of sight from viewers; • Establish limits of disturbances during construction through the demarcating of the construction areas to prevent unnecessary damage to vegetation; • Keep to existing road infrastructure as far as possible to minimise the physical damage to vegetation in the power line servitude; and	**Low**

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			• Implement rehabilitation of disturbed areas as soon as possible to limit the duration of exposed surfaces. • Minimise unsightly cut- and fill areas by stepping the substation building platform and thereby lowering the structure by as much as possible; • Shape the cut and fill embankments by rounding the edges and giving it a more natural appearance if space permits. Alternatively, embankments must be stabilised preferably through planting (unlikely to be an option inside the substation boundary fence due to safety consideration) to cover up any exposed soil and to restrict erosion; • Establish screening planting along the sides of the substations that front towards the communities. Alternatively it should be relocated to a site that has a natural screening capacity; • Signage should be simple and unobtrusive and not protrude above the skyline when viewed from any direction; and • A definite effort should be made to reduce the height and scale of the substations, if at all possible.	
Geotechnical Impacts	***Direct impacts: Both alternatives*** Soil disturbance during construction at substation sites which may destabilise the soil and lead to soil erosion **Similar impacts for both Alternatives**, slightly more **pronounced at Alternative 2** (dongas)	Medium	• Use of berms and drainage channels to direct water away from the construction areas where necessary • Use existing access roads wherever possible • Rehabilitate disturbed areas as soon as possible after construction • Correct engineering design of stream and water course crossings • Correct engineering design of any new access roads	Medium -low
	NHBRC class C1/s1 or C2/S2 (depends on thickness) at both sites. The possible presence of shallow rock (granite, granophyre & gabbro) or hardpan calcrete (within 1,5m of surface) could result in areas of	Medium	• Steep slopes (>45°) and areas immediately below them should be avoided for the siting of pylons and maintenance roads wherever possible. These areas are subject to slope failure and are vulnerable to erosion.	Low

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
	difficult excavation. Core stones could perhaps require blasting. Some clayey alluvium could be found NHBRC Class H to H3 – to be catered for in the design of substations (both alternatives)			
	Shallow perched water table could saturate foundation soils and have a detrimental effect on bearing capacity at the substation sites. Ground water pollution is a potential threat.	Medium	• Floodplains and areas in close proximity to rivers need to be avoided. • No infrastructure should be placed in or close to pans, vleis and wetlands.	**Low**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: *None identified*	N/A	N/A	**N/A**
Dust Impacts ***similar for both alternatives due to similar environments***	***Direct impacts:*** Construction machinery and heavy vehicles which are likely to make use of the existing farm roads to transport equipment and material to the construction site, are likely to generate dust which is likely to be perceptible by adjacent residents. Trucks may potentially distribute dust along access roads	Low	• Continuous watering of the site should be carried out to prevent dust pollution during windy and dry conditions. • A continuous dust monitoring process needs to be undertaken during construction. • Speed restriction of 20km/h must be implemented for all construction vehicles. • All vehicles transporting friable materials such a sand, rubble etc must be covered by a tarpaulin or wet down. • Construction work to be undertaken during weekdays as far as practical.	**Low**
	Indirect impacts: None identified.	N/A	N/A	**N/A**
	Cumulative impacts: None identified.	N/A	N/A	**N/A**
Spillage of	***Direct impacts***	Medium	*Store fuels and chemicals in a bunded area. Provide staff with*	**Low**

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
hazardous substances ***similar for both alternatives due to similar environments***	Several activities can cause the spillage of hazardous substances, causing contamination of receiving environment at the construction site. These include spillages from unmanaged ablution facilities, spillages of fuels and oils, spillage of concrete and cement and runoff of contaminated cement wastewater.		*hazardous materials training.*	
	Indirect impacts None identified	N/A	N/A	**N/A**
	Cumulative impacts None identified	N/A	N/A	**N/A**
Fires ***similar for both alternatives due to similar environments***	***Direct impacts*** Fires may be caused through a number of actions or reasons, such as defective equipment, cigarette butts, and spilled fuels and oils. Fires are generally the result of bad or ineffective management, or negligence.	Medium	Fire fighting equipment to be kept on site and serviced regularly.	**Low**
	Indirect impacts None identified	N/A	N/A	**N/A**
	Cumulative impacts None identified	N/A	N/A	**N/A**
Impact on socio-economics ***similar for both alternatives due to similar environments and distances away***	***Direct impacts:*** Impact on closest residential areas - Influx of workers in the area may raise concerns from neighbouring residents, however the substations are not located in close proximity to the actual homesteads	Medium	• All adjacent landowners must be informed of the construction processes prior to commencement of construction activities. • Adjacent land owners must be informed timeously of any service stoppages in their areas. • Notification must include possible timeframes for stoppages. • Consequences of such stoppages must be clearly indicated to all surrounding/affected land owners. • Affected land owners must be timeously informed of any/all	**Low**

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
from residential areas			maintenance of the bulk water services supply which may result in service stoppages to their properties. Again this must include possible timeframes so alternatives can be provided.	
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Impacts on traffic and local roads ***similar for both alternatives due to similar environments, and rural character of the study area***	***Direct impacts:*** Traffic will be congested as a result of construction activities. In addition, traffic increase can lead to road damage, erosion, accidents and even traffic delays Construction machinery and heavy vehicles are likely to generate dust which is likely to be perceptible by adjacent residents. Trucks may potentially distribute dust along internal access roads.		• Vehicular movement beyond the property boundaries may not occur during peak hour traffic times (07h30 – 08h30 and 16h00 – 17h00). • It must be ensured that a backlog of traffic does not develop at the access points during peak hours through the upgrade to the road system and the implementation of an efficient and effective access control system. • Speed restriction of 20km/h must be implemented for all construction vehicles. • Implement dust suppression measures (wetting or application of soil binding compound) in all areas that will be affected by construction • activities and where dust will be generated	
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A
Impact on socio-economics: ***similar for both alternatives due to similar social environments***	***Direct impacts:*** Economic and employment status will be impacted on due to access and road construction, building construction, paving construction, site clearance and landscaping.	Low	The construction phase will provide (limited) direct temporary employment for locals, and • Local communities should be informed upfront and in no uncertain terms that the possibility of local employment is most unlikely so that unrealistic expectations are not created • Where unskilled labour is required, it should be sourced from the local communities • Where project activities lead to the creation of informal job opportunities such as food stalls, contractors should be	**Medium Positive Impact**

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			encouraged to allow such activities	
	Indirect impacts: Indirect employment through demand for construction materials, and support services, as well as empowerment and skills transfer opportunities.	Low	No mitigation measure required	**Low-Medium Positive Impact**
	Cumulative impacts: None identified	N/A	N/A	N/A
Impact on infrastructure services ***similar for both alternatives due to similar rural environments, positive impact the same for both options***	***Direct impacts:*** The status of the infrastructure services may be impacted on through the establishment of the site and the construction of roads.	**Medium Positive Impact**	• The status of the infrastructure services in the surrounding area will be improved through the establishment of the site and the upgrade of roads in the area. • Inspect the site for burst, blocked or leaking water pipes • During the operational phase of the substation, the sewage system must be inspected for leakages on regular basis and any leakages must be attended to immediately.	**High Positive Impact**
	Indirect impacts: None identified	N/A	N/A	**N/A**
	Cumulative impacts: None identified	N/A	N/A	**N/A**
Increased soil erosion ***similar for both alternatives but more pronounced at Alternative 2 site that is located close to erosion dongas and seasonal stream***	Loss of fertile topsoil will occur due to the initial vegetation clearing (for access roads and on the site of the substation); and construction earthworks may cause increased soil erosion as well as stormwater runoff.	Medium	• If at all possible, construction activities should preferably take place during the dry winter months. • Stockpiles in excavated areas should not be higher than 2 m to avoid compaction and visual impacts. • To prevent erosion of materials stockpiled for a long period of time, the material must be retained in a bermed area. • Do not allow erosion to develop on a large scale before taking action. • Make use of existing roads and tracks where feasible, rather than creating new routes through grassland areas. • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area (DWAF, 2005).	**Low**

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			• Runoff from roads must be managed to avoid erosion and pollution problems. • Remove only the vegetation where essential for construction of teh substation and do not allow any disturbance to the adjoining natural vegetation cover. The grassland can be removed as sods and re-established after construction is completed. • Colonisation of the disturbed areas by plants species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study area. • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.	
Health and safety impacts ***similar for both alternatives due to similar rural environments***	***Direct impacts:*** Impacts/injuries to animals or humans entering the site unnoticed	Medium	• The construction camp and substation site and any excavations must be fenced off and demarcated using danger tape to ensure that no animals or residents enter the area. • No fires are allowed at or around the construction site. • The contractor must provide gas fired stoves and heaters to the workers • Implement Health Awareness programs to reduce the wide spread of diseases such as HIV/AIDS as well as educating workers on issues related to safe sex. • Provide mobile toilets, avoid contamination of land and surface water (e.g. rivers, springs and wetlands), and provide safe drinking water to reduce the consumption of contaminated water from streams/rivers or boreholes.	Low
	Workforce and construction sites	Medium	• Ensure all construction vehicles and machinery are under the control of competent personnel. • Limit access to the construction site to the workforce only. • Safety clothes and equipment must be worn at all times. • Comply with the requirements of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993).	Low

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A
Waste Management impacts ***similar for both alternatives due to similar environments***	***Direct impacts:*** Improper storage and disposal of solid waste, littering and ablution facilities	Medium	• All solid waste generated during the construction process at the substation must be placed in a designated waste collection area within the construction camp and must not be allowed to blow around the site, be accessible to animals, or be placed in piles adjacent the waste skips / bins. • All solid waste must then be disposed of at the nearest licensed landfill and safe disposal certificates obtained. • Separate waste skips/ bins for the different waste streams must be available on site. The waste containers must be appropriate to the waste type contained therein and where necessary should be lined and covered. This will be managed through the site specific EMPr and monitored by the ECO. • Littering will not be permitted on the site and general housekeeping will be enforced. • General waste bins must be readily available for litter disposal and general housekeeping. The EMPr must be followed during construction of the substation • All excess material and rubble must be removed from the site so not to restrict the rehabilitation process. • Adequate toilet facilities must be provided for all staff members as standard construction practice. • Chemical toilets must be placed within the construction camp and not in close proximity to any river. The chemical toilets to be provided must be from a registered company and all sewage must be disposed of at an appropriate facility. Safe disposal certificates must be kept on record. • No wastes may remain on the construction site for more than two weeks • Keep the properties neat and litter free at all times and maintain the	Low

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
			landscaped areas.	
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A
Impacts on ground water ***similar for both alternatives due to similar environments***	***Direct impacts:*** Groundwater contamination - Hydrocarbon leakages from plant vehicles and poor management of sources of hydrocarbon leakages has a potential to pollute underground and surrounding resources	Medium	• Construction vehicles are to be maintained in good working order, to reduce the probability of leakage of fuels and lubricants. • All cement mixing must occur on impervious surfaces and within controlled bermed areas. • Oil residue must be treated with oil absorbent such as Drizit or similar and this material removed to a licensed waste disposal site. • Contractor/s must provide regularly serviced portable chemical toilets for construction workers at a distance no more than 200 m from the place of construction. • No materials may be discharged from the construction camps.	Low
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A
Noise Impacts ***similar for both alternatives as both proposed site alternatives are located away from the towns, out in the open field***	***Direct impacts:*** Vehicles transporting materials to and from the site will potentially cause an additional noise burden to residents as well as along internal access roads.	Medium	• The contractor must ensure that noise levels remain within acceptable limits • Construction activities must be limited to normal working hours and according to municipal bylaws, i.e. working hours must be limited to weekdays as far as possible. • If construction is required on the weekend; permission from adjacent landowners will be required prior to construction.	Vey Low
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A
Impacts on stormwater	***Direct impacts:*** The accumulation of stormwater.	Medium	• No stockpiles or construction materials may be stored or placed within any drainage line that may be in close proximity of storm water drains.	Low

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
Activity	**Impact summary**	**Significance rating of impacts: (without mitigation)**	**Proposed mitigation**	**Significance rating of impacts after mitigation**
similar for both alternatives			• No stockpiles or construction materials may be stored or placed in close proximity to storm water drains. • The storm water system especially discharge points must be inspected and damaged areas must be repaired if required.	
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
OPERATIONAL PHASE IMPACTS				
Impacts on Flora ***Impacts for both alternatives regarding fauna are likely to be similar due to similar Floral environments***	***Direct impacts:*** *Positive* impact by removing alien invasive plants, although care must be taken not to remove all vegetation at once, especially within the rainy season (could result in soil erosion and soil loss).	Medium	• Rehabilitate all areas cleared of invasive plants as soon as practically possible, utilising specified methods and species. • Dispose of the eradicated plant material at an approved solid waste disposal site. • Only indigenous plant species naturally occurring in the area should be used during the rehabilitation of the areas affected by the construction activities.	Low
	Destruction of natural vegetation	Medium	• After construction of the substation, the land must be cleared of rubbish, surplus materials, and equipment. • Ensure that maintenance work does not take place haphazardly, but according to a fixed plan. • Maintenance workers may not trample natural vegetation surrounding the substation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.	Low
	Indirect impacts: Bush encroachment	Medium	• Use grass sods that were removed prior to construction to rehabilitate the construction footprints (e.g. the construction camp area). • Maintenance workers may not trample natural vegetation and work	Low

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
			should be restricted to previously disturbed footprint of the substation. In addition, mitigation measures as set out for the construction phase should be adhered to.	
	Cumulative impacts:	N/A	N/A	N/A
Disruption to local residents ***Impacts for both alternatives regarding fauna are likely to be similar due to similar environments***	***Direct impacts:*** Power cuts during maintenance may disrupt local people	Medium	Inform residents if planned power cuts at least 15 -30 days before implementing	Low
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A
Impacts on Fauna ***Impacts for both alternatives regarding fauna are likely to be similar due to similar faunal environments (disturbed area, overgrazed)***	***Direct impacts:*** Faunal Disturbance - During the operational phase fauna of the area surrounding the substation site will be minimally disturbed (occasionally during maintenance of the infrastructure) This impact will be on a limited basis dependent on the need for maintenance.	Medium	• Maintenance activities should be limited to daylight hours and vehicles should remain on the designated roads at all times	Low
	Indirect impacts: none	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A
Impacts on Socioeconomic ***Impacts for both alternatives regarding are likely to be similar due to similar socio-economic conditions***	***Direct impacts:***	N/A	N/A	N/A
	Indirect impacts: Local Business growth (as result of network improvements)	low	none	low
	Cumulative impacts: None identified	N/A	N/A	N/A
Visual Impacts ***Impacts for both***	***Direct Impacts:*** **Aesthetic quality and sense of place:**	Low to High Depending on the	• All lighting, especially perimeter security lighting at the substation must be shielded to minimise light spillage and pollution. No direct	Medium

PROPOSED KGABALATSANE SUBSTATION AND ALTERNATIVES				
alternatives regarding fauna are likely to be similar rural area away from residential areas	The substation will cause intrusions on observers' views especially on those residents who may decide to reside within 1 km of the substation (future planning of developments should keep this in mind). This will result from the introduction of new elements that are uncharacteristic of the study area and will alter the baseline condition to the visual environment. The "industrial character" of the substation will contrast severely with the rural and natural character of the landscape. These will be representative of anthropogenic alternations to a study area that is expected to impact on the value of the visual environment.	distance from the substation and screening of vegetation.	light sources must be seen from outside the site; • Screen planting that was specifically established to minimise the intrusiveness of the substation must be maintained and dead or sick plants replaced for a determinate period after construction.	
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A
Soil erosion ***Impacts Alternative 2 would be more pronounced, due to the location of the substation in the vicinity of a seasonal water course and erosion dongas.***	***Direct impacts:*** Storm water runoff from the substation surface may cause soil erosion of adjacent areas	Medium	• Regularly inspect all storm water channels • Provide soil conservation measures in areas of susceptible erosion around the substation	Low
	Indirect impacts: None identified	N/A	N/A	N/A
	Cumulative impacts: None identified	N/A	N/A	N/A

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4. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Summary of specialist findings for the respective power line Alternatives at Kgabalatsane

(1= Minimal impacts, 2= Low to Medium Impacts, 3= Medium to High impacts)

KGABALATSANE POWER LINE ALTERNATIVES RANKING

AREA OF IMPACT	ALTERNATIVE 1 power line (Red route)	ALTERNATIVE 2 power line (Blue route)	ALTERNATIVE 3 power line (Green route)
VEGETATION	1	1	1 Protected species found at donga
FAUNAL	1	1	1
AVI FAUNA	1	2 Line to cross streams (water birds)	2 Line to cross streams
WETLANDS & WATER COURSES	1	2 Line to cross seasonal drainage line	2 Line to cross seasonal drainage lines & donga
HERITAGE	1	2 Cemeteries in area	2 Stone tools found
VISUAL	1	1	2 Line to cross M20
GEOTECHNICAL SUITABILITY	1	1	1-2
TOTAL SCORE (LOWEST = BEST)	7	10	11

1= No or Minimal impacts 2= Low to Medium Impacts 3= Medium to High impacts

Summary of specialist findings for the two Substation Alternatives at Kgabalatsane

(1= No to Minimal impacts, 2= Low to Medium Impacts, 3= Medium to High impacts)

KGABALATSANE SUBSTATION ALTERNATIVES RANKING

AREA OF IMPACT	ALTERNATIVE 1 (Red)	ALTERNATIVE 2 (Blue)
VEGETATION	1	2 SS near drainage line
FAUNAL	1	1
AVI FAUNA	1	2 SS near drainage line
WETLANDS WATER COURSES	1	2 Substation near seasonal drainage line
HERITAGE	1	1
VISUAL	2	2
GEOTECHNICAL SUITABILITY	1	3 Substation near donga & drainage line (clay)
TOTAL SCORE (LOWEST = BEST)	8	13

1= No or Minimal impacts **2= Low to Medium Impacts** **3= Medium to High impacts**

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Appendix G: Environmental Management Programme (EMPr)

ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

for the

PROPOSED CONSTRUCTION OF 132KV KGABALATSANE SUBSTATION AND THE ASSOCIATED POWER LINE

DEA Reference Number: DEA REF NO: 14/12/16/3/3/1/1320

JANUARY 2016

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1. INTRODUCTION AND BACKGROUND

Eskom Holdings SOC Limited, Distribution Division is proposing to construct the Kgabalatsane Substation and 132kV associated overhead Power Line near Garankuwa.. The loop-in, loop-out power line will be connected to a previously proposed power line which connects the existing Garankuwa- and the proposed Dipompong Substation. The Garankuwa-Dipompong power line is not constructed yet and is not part of this study.

The original application was submitted in terms of the NEMA EIA Regulations, 2010: GN544 promulgated under Chapter 5 of the National Environmental Management Act (Act 107 of 1998) ("NEMA"), and published in Government Gazette 33306 on 18 June 2010. A Basic Assessment Report (BAR) was required for this project. Therefore, in order to be able to construct the proposed 132kV overhead power line and substation for Kgablatsane, an, application for environmental authorisation must again be obtained.

Eskom Holdings SOC Ltd has appointed Envirolution Consulting as independent environmental consultants, to undertake the BAR process. The main objective of the BAR is to identify and assess potential environmental impacts associated with the proposed project, and to compile appropriate mitigation measures. The following reference number was allocated:

DEA Reference Number: 14/12/16/3/3/1/1320

It is understood that any development can pose various risks to the environment as well as the residents or businesses in the surrounding area. These possible risks should be taken into account during the planning phase of the development. An Environmental Management Programme (EMPr) is required for the proposed project as per the National Environmental Management Act (Act No. 107 of 1998) (NEMA) EIA Regulations, 2010. The implementation of this EMPr, through the appointed contractor, remains the responsibility of the applicant, Eskom.

The purpose of this EMPr is to formulate mitigatory measures that should be made binding to all contractors during construction of the proposed development, as well as measures that should be implemented during the operational phase. The point of departure for this EMPr is to take a pro-active route by addressing potential problems before they occur. The EMPr will also provide management responses that will ensure that the impacts of the development are minimised. This should limit corrective measures needed during the construction and operational phases of the development. Additional mitigation will be included throughout the project's various phases as necessary. This EMPr is, therefore, a stand-alone document, which must be used on site during each phase of the development (planning, construction and operational phases).

This document should be flexible so as to allow the contractor and developer to conform to the management commitments without being prescriptive. The management commitments prove that the anticipated risks on the environment will be minimised if they are adhered to consistently. The onus set out in the EMPr rests with the developer, main contractors and subcontractors, which promotes responsibility and commitment. Any parties responsible for transgression of the underlying management measures outlined in this document will be held responsible of non-compliances and will be dealt with accordingly.

Explanation of inclusions and exclusions
A vegetation assessment was conducted as part of the BA. The proposed project will traverse vegetation groupings that were classified as natural bushveld (*Marikana Thornveld*) vegetation as well as (limited) wetland vegetation. Any protected species that are found during construction will thus require a plant rescue and protection plan will have to be compiled for the construction phase of this project after the final route has been determined.
No open space plan required due to no open space zoning for this linear project. The substation sites will be designed as per requirements and the nature of the usage will not enable open space planning, landscaping apart from maintenance of the surface area (paved or surfaced with gravel) inside the fence around the substation.
A wetland rehabilitation plan was conducted as part of the BAR. Specialist study report was included in the BAR document.
ESKOM have their own minimum standards for bush clearing and maintenance of overheard powerline and applicable servitudes. This document forms part of the tender agreements with contractors. The requirements outlined in the standards will be adhered to during the construction of the powerline.
A storm water plan in the design of the substations is required and must incorporate these requirements in the detailed design drawings. The design has not yet been finalised
Mitigation measures for the management and control of soil erosion have been included as part of the BAR and this draft EMPr
Mitigation measures for erosion management have been included as part of this draft EMPr.
Traffic impact assessment is not required. This is a rural area with low traffic volumes.The proposed projects will only have limited increase in traffic during the construction phase.

The document has been based on the findings of the on site assessment undertaken by Envirolution and the specialist studies. All the Environmental specifications and the procedures discussed in this document were also developed in accordance with the relevant legislation applicable to the development.

This draft Environmental Management Programme was compiled by:

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Ms le Roux heads the project team and acts as the Project Manager for all phases of the project. Ms le Roux holds a Baccalaureus Artium degree in Geography from the University of Stellenbosch (1989) and a Master's degree in Town and Regional Planning from the Free State University (1993). She has completed a course in Environmental Management with the North-West University (1998), and a Planet-GIS course from UNISA (2014). She has been registered as an Environmental Assessment Practitioner (EAPSA) in 2003 and has more than 20 years of applied experience in the fields of land use and environmental management. Ms le Roux has extended experience in managing Environmental Impact Assessments (EIAs, BAs),

environmental auditing and conducting environmental awareness, and is currently employed by Envirolution Consulting (Pty) Ltd.

2. PHASES OF THE PROJECT

The process which was followed in compiling the EMPr is in compliance with NEMA EIA Regulations (2010), and applies the principle of Integrated Environmental Management (IEM). Note: The application was submitted before the 2014 Regulations were promulgated.

The EMPr deals with the following phases as detailed below.

2.1. The Planning Phase

The EMPr offers an ideal opportunity to incorporate pro-active environmental management measures with the goal of attaining sustainable development.

Pro-active environmental measures minimize the chance of impacts taking place during the construction and operational phase. There is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g. this EMPr) during the planning phase, the necessary corrective action can be taken to further limit potential impacts.

2.2. The Construction Phase

The bulk of the impacts during this phase will have immediate effect. If the site is monitored on a continual basis during the construction phase; it is possible to identify these impacts as they occur. These impacts will then be mitigated through the contingency plans identified in the planning phase, together with a commitment to sound environmental management from the developer.

2.3. The Operational Phase

By taking pro-active measures during the planning and construction phases, potential environmental impacts emanating during the operational phase will be minimised. This, in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete.

3. RESPONSIBILITIES OF THE ROLE PLAYERS

3.1. Developer (Eskom)

The developer remains ultimately responsible for ensuring that the development is implemented according to the requirements of the EMPr. Although the developer appoints specific role players to perform functions on his/her behalf, this responsibility is delegated. The developer is responsible for ensuring that sufficient resources (time, financial, human, equipment, etc.) are available to the other role players (e.g. the ECO, ELO and contractor) to efficiently perform their tasks in terms of the EMPr. The developer is liable for restoring the environment in the event of negligence leading to damage to the environment.

The developer must ensure that the EMPr is included in the tender documentation so that the contractor who is appointed is bound to the conditions of the EMPr.

The developer must appoint an independent Environmental Control Officer (ECO) during the construction phase to oversee all the environmental aspects relating to the development.

3.2. Contractor

The contractor, as the developer's agent on site, is bound to the EMPr conditions through his/her contract with the developer, and is responsible for ensuring that he adheres to all the conditions of the EMPr. The contractor must thoroughly familiarise him/herself with the EMPr requirements before construction begins and must request clarification on any aspect of these documents, should they be unclear. The contractor must ensure that he/she has provided sufficient budget for complying with all EMPr conditions at the tender stage.

The contractor must comply with all orders (whether verbal or written) given by the ECO, project manager or site engineer in terms of the EMPr.

3.3. Resident Engineer (RE)

The Resident Engineer (RE) will be appointed by the 'Consultant' and will be required to oversee the construction programme and construction activities performed by the Contractor. The RE is expected to liaise with the Contractor and ECO on environmental matters, as well as any pertinent engineering matters where these may have environmental consequences. He/she will oversee the general compliance of the Contractor with the EMPr and other pertinent site specifications. The RE will also be required to be familiar with the EMPr specifications and further monitor the Contractor's compliance with the Environmental Specifications on a daily basis, through the Site Diary, and enforce compliance.

3.4. The Environmental Control Officer (ECO)

The Environmental Control Officer (ECO) is appointed by the developer as an independent monitor of the implementation of the EMPr. He/she must form part of the project team and be involved in all aspects of project planning that can influence environmental conditions on the site. The ECO must attend relevant project meetings, conduct inspections to assess compliance with the EMPr and be responsible for providing feedback on potential environmental problems associated with the development. In addition, the ECO is responsible for:

- Liaison with relevant authorities;
- Liaison with contractors regarding environmental management; and
- Undertaking routine monitoring and appointing a competent person/institution to be responsible for specialist monitoring, if necessary.

The ECO has the right to enter the site and do monitoring and auditing at any time, subject to compliance with health and safety requirements applicable to the site (e.g. wearing of safety boots and protective head gear).

(a) Liaison with Authorities

The ECO and Eskom Environmental Representatives will be responsible for liaising with DEA. The ECO must submit environmental audit reports to the authorities should they be required for the project. These audit reports must contain information on the contractor and developer's levels of compliance with the EMPr. The audit report must also include a description of the general state of the site, with specific reference to sensitive areas and areas of non-conformance. The ECO must indicate suggested corrective action measures to eliminate the cause of the non-conformance incidents. In order to keep a record of any impacts, an Environmental Log Sheet (refer to **Appendix 1 of this EMPr)** is to be kept on a continual basis.

(b) Liaison with Contractors

The ECO is responsible for informing the contractors of any decisions that are taken concerning environmental management during the construction phase. This would also include informing the contractors of the necessary corrective actions to be taken.

3.5. Environmental Liaison Officer (ELO)

The contractor must appoint an Environmental Liaison Officer (ELO) to assist with day-to-day monitoring of the construction activities. Any issues raised by the ECO will be routed to the ELO for the contractors' attention. The ELO shall be permanently on site during the construction phase ensuring daily environmental compliance with the EMPr and should ideally also be a senior and respected member of the construction crew. Past experience has revealed that, ELO's that can relate to the work force are the most effective for information transfer and ensuring compliance with the EMPr.

All the responsible parties mentioned in this section are responsible for ensuring the implementation of the EMPr and Waste Management Plan (WMP) procedures outlined in the Tables, for the duration of the project.

4. ENVIRONMENTAL MANAGEMENT PROGRAMME

The EAP and Project specialists have evaluated all potential issues in a corridor of approximately 1000 meters wide. This would allow for fine scale adjustments of the tower positions if required.

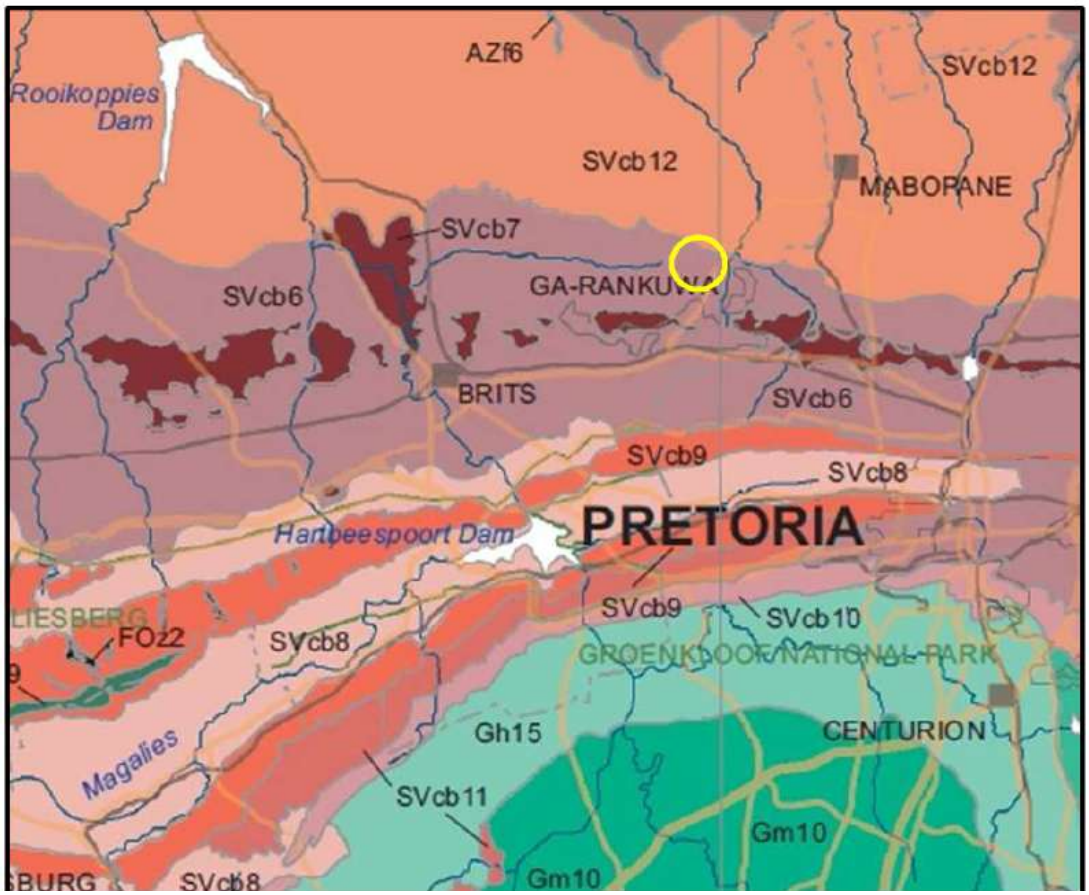

Figure 1: A section of the VEGmap (Mucina & Rutherford 2006).
Yellow circle indicates study area.

The table that follows forms the core of this EMPr for the construction and operational phases of the development. This table should be used as a checklist on site, especially during the construction phase.

Compliance with this EMPr must be audited during the construction phase and following completion of construction.

PLANNING PHASE EMPr

Table 1: Planning & Design Phase

Activity / issue	Action required	Responsible party	Frequency
Appointment and Duties of ECO	The Developer must appoint an independent Environmental Control Officer (ECO) who must monitor the contractor's compliance with the environmental management plan.	Developer	Once-off
	The developer must provide the ECO and contractor with a copy of the EMPr.	Developer	Once-off
	The priority of the ECO is to maintain the integrity of the development conditions outlined in the EMPr.	ECO	Continuous
	The ECO must form part of the project management team and attend all project meetings.	ECO	Continuous
	The contractor must ensure that the construction crew attend an environmental briefing and training session presented by the ECO prior to commencing activities on site.	ECO, Contractor	Once-off
Appointment and Duties of ELO	The contractor must appoint an Environmental Liaison Officer (ELO). This person will be required to monitor the situation with a direct hands-on approach, and ensure compliance and co-operation of all personnel.	Contractor	Once-off
EMPr	This EMPr must be made binding to the main contractor as well as individual contractors and should be included in tender documentation for the construction contract.	Developer, ECO	Once-off
	All activities on the site must comply with the **Madibeng Municipality's** By-Laws.	Developer, ECO and Contractor	Continuous
Environmental Protection Plan	Within 21 days of the Commencement Date, the Site Contractor shall prepare and submit to the Project Manager for approval in consultation with the ECO an Environmental Protection Plan. The Plan shall cover all environmental protection works and shall also include descriptions of environmental safeguards and emergency procedures.	Developer, ECO, Contractor	Once - off

Activity / issue	Action required	Responsible party	Frequency
	The Plan shall include a description of the administrative structure and lines of communication which shall be established between the Contractor's and his subcontractors' workforce for the implementation of environmental protection procedures. Details of the expertise available for the implementation of environmental protection procedures must also be provided.	Contractor, RE, ECO	Once off
	In addition this plan must have a site layout plan and showing the final positions and extent of all permanent and temporary site structures and infrastructure, including: • Buildings • Contractors' accommodation. • Contractors' camp • Roads and access routes • Gates and fences. • Essential services (permanent and temporary water, electricity and sewage) • Rubble and waste rock storage and disposal sites. • Site toilets and ablutions. • Firebreaks. • Excavations and trenches. • Topsoil stockpiles. • Spoil areas. • Construction materials stores. • Vehicle and equipment stores. • Sensitive and No go areas & applicable buffers (e..g. wetlands) • All temporary and permanent water management structures including bunds and sumps	Contractor, RE, ECO	Once off
Permits and Permissions	The Developer shall ensure that all pertinent permits, certificates and permissions have been obtained prior to any activities commencing on site and ensure that they are strictly enforced / adhered to. This includes, for example, updating the Department of Water and Sanitation (DWS) licence and other monitoring programs if applicable.	Contractor, Developer	Continuous

Activity / issue	Action required	Responsible party	Frequency
	The Contractor shall maintain a database of all pertinent permits and permissions required for the contract as a whole and for critical activities for the duration of the contract.	Contractor, Developer	Continuous
Method Statements	The Contractor shall submit written Method Statements to the RE for the activities identified by the RE or ECO. Activities that will require method statements include: • Logistics for the Environmental Awareness Training Course • Location and Layout of Construction camp • Construction procedures • Protection of heritage resources (graves, old buildings and bridges) • Solid and Hazardous Waste Management • Drainage and Storm water planning • Dust Control • Stockpiling area • Vegetation removal • Materials and equipment to be used • Getting the equipment to and from the site • How the equipment material will be moved while on site • How and where material will be stored • The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur • Timing and location of activities • Compliance/non compliance with Specifications • Site camp establishment • Concrete pre-cast and batching operation • Emergency procedures • Materials, equipment and staffing requirements • Transporting the materials and/or equipment to, from and within the site • Stockpiling of rubble	Contractor, RE, ECO .	As necessary

Activity / issue	Action required	Responsible party	Frequency
	• General and Hazardous waste management on site • The storage provisions for the materials and/or equipment • The proposed construction procedure designed to implement the relevant Environmental Specifications • Other information deemed necessary by the RE and/or ECO. Method Statements shall be submitted at least ten working days prior to the proposed commencement of work on an activity to allow the RE (and/or ECO) time to study and approve the method statement.		
	Contractor shall not commence work on that activity until such time as the Method Statement has been approved in writing by the RE contract.	Contractor, RE, ECO	Continuous
	The Contractor shall carry out the activities in accordance with the approved Method Statement.	Contractor, RE. ECO	Continuous
	Under certain circumstances, the RE may require changes to an approved Method Statement. In such cases the proposed changes must be agreed upon in writing between the Contractor and the RE, and appropriate records retained.	Contractor, RE	Continuous
	Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the EMPr specifications.	Contractor, Developer	Continuous
Environmental Awareness and Training	- The Contractor shall ensure that all site personnel have a basic level of environmental awareness training. Topics covered should include; • What is meant by "Environment" • Why the environment needs to be protected and conserved • How construction activities can impact on the environment • What can be done to mitigate against such impacts • Awareness of emergency and spills response provisions • Social responsibility during construction of the power lines e.g. being considerate to local residents	Developer, Contractor, ECO	Continuous

Activity / issue	Action required	Responsible party	Frequency
	- It is the Contractor's responsibility to provide the site foreman with environmental training and to ensure that the foreman has sufficient understanding to pass this information onto the construction staff. - Training should be provided to other staff members in the use of the appropriate fire-fighting equipment. Translators are to be used where necessary. - Use should be made of environmental awareness posters on site. - The need for a "clean site" policy also needs to be explained to the workers. - Staff operating equipment (such as excavators, loaders, etc.) shall be adequately trained and sensitised to any potential hazards associated with their tasks. - The Contractor must monitor the performance of construction workers to ensure that the points relayed during their introduction have been properly understood and are being followed.		
Existing Services and Infrastructure	The Contractor shall ensure that existing services (e.g. roads, pipelines, power lines and telephone services) are not damaged or disrupted.	Contractor, RE, ECO	Continuous.
	The Contractor shall be responsible for the repair and reinstatement of any existing infrastructure that is damaged or services which are interrupted.	Contractor	As necessary
	Such repair or reinstatement will be to the Contractor's cost and shall receive top priority over all other activities.	Contractor	Continuous
	A time limit for the repairs may be stipulated by the RE in consultation with the Contractor.	Contractor, RE, ECO	Continuous
Environmental incidents	The contractor must take corrective action to mitigate an incident appropriate to the nature and scale of the incident and must also rehabilitate any residual environmental damage caused by the incident or by the mitigation measures themselves. All incidents must be reported to the ECO and the developer.	ELO, ECO, Contractor	Continuous

CONSTRUCTION PHASE EMPr

Table 2: Construction Phase

Activity / issue	Action required	Responsible party	Frequency
Site establishment	If construction camp is required in the study area, the contractor must establish a construction camp in an area as agreed with the ECO. The site for the construction camp must not be in an environmentally sensitive area such as close proximity to a watercourse, on a steep slope or on erosive soils. The area must be properly demarcated prior to establishment to prevent the construction camp from being unnecessarily large. The camp must be properly fenced.	ECO, Contractor	Once off
	The working width of the construction area must be clearly demarcated by the installation of coloured pegs prior to construction. Particularly sensitive areas (e.g. river or drainage lines) must be demarcated with danger tape.	ECO, Contractor	Once off, monitor weekly
	The lateral spread of the construction must be monitored on a weekly basis.	ECO, ELO, Contractor	Monitor weekly
	The use of roads on landowner property should be determined based on discussions with landowners during the negotiation process. Letters of agreement with landowners must be kept on a file	ECO, Contractor	Continuous,
	ELO will also be required to monitor unauthorised movement of construction crew.	ELO, Contractor	Once off, monitor daily
	The developer should provide dustbins to be used during site preparation and surveying.	Developer	Once off
	To prevent excessive disturbance of natural vegetation, the contractor should use existing disturbed or paved areas wherever possible.	ECO, Contractor	Once off, monitor weekly

Activity / issue	Action required	Responsible party	Frequency
	To prevent the deterioration of surface water quality, the contractor must provide adequate ablution facilities. However these facilities must not be placed within the vicinity of watercourses. Toilets are to be emptied regularly throughout the construction phase. Every effort must be made to prevent the contamination of surface or sub-surface water.	Contractor	Bi-weekly inspections
Excavation of towers	All excavation (if not working in the area) should be barricaded/covered to prevent safety and environmental accidents	ELO, Contractor	Monitor daily
	Minimise the time taken to complete each operation that is causing inconvenience or disruption in this area.	Contractor	Continuous
	Make temporary access ways over any excavations.	Contractor	Continuous
	To inform property owners of the exact time and duration of closing entrances to any properties at any one time.	Contractor	Continuous
Site Housekeeping	The Construction Site and surrounds are to be maintained in a clean orderly and presentable condition at all times.	Contractor	Monitor Daily
	Regular inspections by the Contractor (and ECO) will be undertaken using checklists to ensure a minimum standard of orderliness is maintained.	Contractor, ECO	Weekly
	Construction activities shall avoid causing unnecessary disruption and nuisance to adjacent landowners and the public as a whole.	Contractor	Continuous
General: waste	Litter generated by the construction crew must be collected in rubbish bins and disposed of weekly at registered waste disposal sites.	ELO, Contractor	Weekly
	All building and other rubble, solid and liquid waste etc must be disposed of as necessary at an appropriately licensed refuse facility.	ELO, Contractor	Once off, as necessary
	Ensure that no refuse wastes are burnt on the premises or on surrounding premises. No fires will be allowed on site.	ELO, Contractor	Monitor daily
	The construction site must be kept in a clean and orderly state at all times.	Contractor, Construction crew	Monitor daily
	Ensure that no litter, refuse, wastes, rubbish, rubble, debris and builders wastes generated on the premises be placed, dumped or deposited on adjacent/surrounding properties during or after the construction period of the project are disposed of at dumping site as approved by the Council.	ELO, Contractor	Monitor daily - weekly

Activity / issue	Action required	Responsible party	Frequency
Fire Prevention and Control	The Contractor shall take all reasonable and precautionary steps to ensure that uncontrolled fires are not started as a consequence of his activities on site. No open fires are allowed on site	Contractor	Daily
	The Contractor shall ensure that there is basic fire-fighting equipment available on site as per requirement of the local Emergency Services.	Contractor, ECO	Continuous
	The Contractor shall ensure that all site personnel are aware of the fire risks and how to deal with any fires that occur. This shall include, but not be limited to: • Regular fire prevention talks • Posting of regular reminders to staff.	Contractor, ECO	Continuous
	Any fires, which occur, shall be reported to the Environmental Liaison Officer immediately and then to the relevant authorities. (See example of Incident forms, attached)	Contractor	Continuous
Emergency Procedures	The Contractor shall submit Method Statements covering the procedures and response plan for the main activities, which could generate emergency situations through accidents or neglect of responsibilities. These situations include, but are not limited to: • Accidental fires; • Vehicle and plant accidents; and • Blasting (if required).	Contractor	As necessary
	The Contractor shall assemble and clearly list the relevant emergency telephone contact numbers for staff and brief staff on the required procedures.	Contractor	Weekly
Hazardous Substances	If potentially hazardous substances are to be stored on site, the Contractor shall provide a Method Statement detailing the substances/materials to be used together with the procedures for the storage, handling and disposal of the materials in a manner which will reduce the risk of pollution that may occur from day to day storage, handling, use and/or from accidental release of any hazardous substances used.	Contractor,	Monitor daily - weekly
	Hazardous chemical substances (eg. oil, hydrocarbons) used during construction shall be stored in secondary containers.	Contractor	Monitor daily - weekly

Activity / issue	Action required	Responsible party	Frequency
	The relevant Material Safety Data Sheets (MSDS) shall be available on Site. Procedures detailed in the MSDS shall be followed in the event of an emergency situation.	Contractor	Monitor daily - weekly
	The waste, resulting from the use of hazardous materials, shall be disposed of at a hazardous waste disposal site as approved by the RE. Storage and disposal of waste is regulated through other legislation, which should be complied with i.e. the Occupational Health and Safety Act. Records for disposal must be kept in the Environmental file	Contractor, RE	Monitor daily - weekly
	Surface water draining off contaminated areas containing oil and petrol would need to be channelled towards a sump which will separate these chemicals and oils.	Contractor, RE	Monitor daily - weekly
	Oil residue shall be treated with oil absorbent such as Drizit or similar and this material removed to an approved waste site.	Contractor, RE	Monitor daily - weekly
Health and Safety	The Contractor shall comply with all standard and legally required health and safety regulations as promulgated under the Occupational Health and Safety Act and associated regulations.	Contractor, RE	Daily
	The Contractor shall provide a standard first aid kit at the site office of each camp and/or at additional identified locations where needed.	Contractor	Daily
Air Pollution	All forms of dust/air pollution must be managed in terms of the NEMA Air Quality Act (AQA) 2004, (Act 39 of 2004); this includes the control of noxious and offensive gases, smoke, dust and vehicular emissions. Under no circumstances may heavy smoke be released into the air	Developer, Contractor	Daily
Erosion Control	Appropriate flow diversion and erosion control structures i.e. earth embankments must be put in place where soil may be exposed to high levels of erosion due to steep slopes, soil structure etc.	ELO, Contractor	As necessary
	Should a freak storm displace the temporary earth embankments or other erosion control structures, a visual inspection of the site must be made and any damage be recorded. Any damage and loss of soil resulting from a storm is to be remedied immediately. Should the temporary walls collapse due to construction error, the contractor is to fund the remediation process.	ELO, Contractor	As necessary

Activity / issue	Action required	Responsible party	Frequency
	Measures must be implemented to distribute storm water as evenly as possible to avoid point sources of erosion.	ELO, Contractor	As necessary
	Construction on steep slopes and in soft or erodable material will require erosion control measures and correct grassing methods.	ELO, Contractor	As necessary
	All construction areas should be suitably top soiled and vegetated as soon as is possible after construction.	ELO, Contractor	Continuous
General: noisy activities	Construction and the use of construction machinery should be limited between 06h00 and 18h00 on weekdays only.	Developer, Contractor	Monitor daily
	Institute noise control measures throughout the construction phase for all applicable activities, including the construction times.	ELO, Contractor	Once off, as necessary
	Inform residents of nearby residential areas of planned noisy activities outside the timeframes stated above.	ECO, ELO, Contractor	Once off, as necessary
	No construction should occur during weekends, unless the adjacent residents (± 1km) have been notified in writing at least three days in advance.	ELO, Contractor	Once off, as necessary
	Construction activities must abide by the national noise laws and the municipal noise by-laws with regard to the abatement of noise caused by mechanical equipment.	Developer, ELO, Contractor	Continual
	Prior to blasting (if required), the contractor must inform the adjacent landowners at least five days in advance.	ELO, Contractor	As necessary
General: activities that can cause dust	Wet all unprotected cleared areas and stockpiles with water to suppress dust pollution during dry and windy periods.	ECO, ELO	Monitor daily
	Ensure proper rehabilitation of disturbed areas in order to minimise bare patches.	ELO, Contractor	Continual
General: Crime, safety and security	Ensure that the construction vehicles are under the control of competent personnel and are in proper working order.	Contractor	Before construction commences & continual
	Ensure that only suitably qualified personnel use construction vehicles.	Contractors	Before construction commences & continual
	Ensure that the contact details of the police or security company and ambulance services are available on site.	Contractor	Once off, monitor weekly

Activity / issue	Action required	Responsible party	Frequency
	Limit access to the construction crew camp to construction workers through access control.	ELO, Contractor	Once off, Continual
	Comply with the requirements of the Occupational Health and Safety Act, 1993 (Act No.85 of 1993) requirements.	ELO, Contractor	Continual
	Vehicular traffic during construction activities must be limited to a maximum speed limit of 30 km/hr.	ELO, Contractor	Continual
	Site notices informing the public of the planned activities must be placed at visible locations a few days prior to any blasting.	ELO, Contractor	As necessary
Stripping of vegetation	The working strip required for the construction of the proposed development must be effectively monitored to prevent excessive vegetation removal. By maintaining the maximum amount of stabilising vegetation, the extent of erosive action will be contained.	ELO, Contractor	Monitor weekly
	Should the construction phase occur in the rainy season, the erection of berms may be necessary in areas prone to erosion (e.g. steep slopes or erosive soils). These bermed areas must be monitored frequently for signs of erosion.	ELO, Contractor	Once off, monitor weekly
	Vegetation to be retained during the construction phase must be clearly demarcated with danger tape.	ELO, Contractor	Once off, as necessary
Excavation	The topsoil cleared must be retained. The topsoil contains most of the inorganic matter, decomposed organisms and nutrients, thus the removal of the topsoil constitutes a major loss in terms of ecosystem function. In order to ensure that the minimal amount of soil is removed with vegetation clearance, it is strongly advised that vegetation be harvested as close to ground level as possible before earthworks machinery is utilised. Soil removed in this manner will contain the existing seed bank, stolons, rhizomes and runners as well as an additional supply of organic matter that will be beneficial during the early stages of vegetation reinstatement. Harvested grass should be retained and used as a mulch to combat erosion.	ELO, ECO, Contractor	Once off, monitor weekly
	Topsoil and subsoil must be placed on opposite sides of the trench and must be kept separate throughout construction and rehabilitation.	ELO, ECO, Contractor	Monitor weekly

Activity / issue	Action required	Responsible party	Frequency
	Topsoil must not be stockpiled for an extensive period (> 3 months). This is to prevent the redundance of the existing seed bank as well as the alteration of the soil characteristics (permeability, bulk density etc.).	ELO, ECO, Contractor	Monitor weekly
	Erect signs and/or danger tape around the exposed excavations to warn the public of the inherent dangers.	ELO, Contractor	Continual
Removal of excavated material	Trucks removing excavated material can cause compaction of soil if new pathways are created. Vehicles should, therefore, use existing roads. If the creation of new roads is unavoidable, these temporary roads should be ripped and re-vegetated after use.	ECO, Contractor	Monitor weekly
Stockpiling soil	Ensure that excavated and stockpiled soil material is stored and bermed on the higher lying areas of the site and not in any storm water run-off channels or any other areas where it is likely to cause erosion or where water would naturally accumulate.	ECO, Contractor	Once off, Daily
	The areas where excavated soil will be stockpiled must be bordered by berms to prevent soil loss caused by rain.	ELO, Contractor	Once off, monitor weekly
	Soil stockpiles must not be higher than 2m	ELO, ECO, Contractor	Monitor weekly
Destruction of heritage resources (stone tools and cemeteries were identified by Heritage Specialist)	The contractors and workers should be notified that heritage resources might be exposed during the construction work. Existing findings (cemeteries, and sites with stone tools) must be demarcated as such and treated as No Go areas.	ECO	Once off
	Should any heritage resources be exposed during excavation, work on the area where the heritage resources were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible.	ECO, Contractor	Continuous
	All discoveries shall be reported immediately to the South African Heritage Resources Authority (SAHRA) so that an investigation and evaluation of the finds can be made. Acting upon advice from SAHRA, the Environmental Control Officer will advise the necessary actions to be taken.	ELO, Contractor	Continuous
	Under no circumstances shall any heritage resources be removed or interfered with by anyone on the site unless under the instruction of SAHRA. Destruction of heritage resources is not allowed.	ELO, Contractor	Continuous

Activity / issue	Action required	Responsible party	Frequency
	Contractors and workers shall be advised of the penalties associated with the unlawful removal of heritage resources as set out in section 51(1) of the National Heritage Resources Act (Act No. 25 of 1999).	ECO	Once off
	A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage resources and should be held accountable for any damage.	Developer	Once off
Protection of Sensitive Environments and Natural Features	Alien species of vegetation should be removed from any working areas and the site camp(s). Alien vegetation species should also be eradicated when they begin to establish themselves in disturbed areas (disturbance of the natural vegetation will encourage the establishment of invasive species). In order to discourage the spread of alien species, soil should not be moved from one part of the site to another without the consent of the ECO.	ECO,ELO, Contractor	Continuous
	Alien and Invasive plant species should be eradicated and managed on the study area according to the Conservation of Agriculture Resources Act (Act no. 43 of 1983) and Section 28 of the National Environmental Management Act, 1998. All areas disturbed as part of the proposed activity will be deemed as the study area.	ECO,ELO, Contractor	Continuous
	Access to any open space system should be controlled to prevent unnecessary disturbances to the residing fauna or vegetation.	ELO, Contractor	Continuous
	The extent of the construction sites and access roads should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance), and no construction personnel or vehicles may leave the demarcated area except those authorised to do so. Those areas surrounding the construction site that are not part of the demarcated development area should be considered as “no-go” areas for employees, machinery or even visitors.	ELO, Contractor	Continuous
	Measures must be put in place to ensure that the energy of storm-water that is to be released into any watercourse is dissipated.	ELO, Contractor	Continuous
	Remove vegetation only within the minimum width necessary for excavation.	ELO, Contractor	Once off

Activity / issue	Action required	Responsible party	Frequency
Aesthetic / visual	Prevent unnecessary removal of vegetation outside the width of the working area by clearly demarcating the working area.	ELO, Contractor	Continual
	Remove vegetation and topsoil and stockpile separately from subsoil prior to excavation.	ELO, Contractor	Continual
	Revegetate disturbed ground in the working area by seeding and spreading of vegetation that has been removed at the start of construction.	ELO, Contractor	Continual
	Killing of birds is not allowed on site	ELO, Contractor	Continual
	Establish screening planting along the sides of the substations that front towards the communities.	ELO, Contractor	Once off
Surface water	Ensure that excavated and stockpiled soil material is stored and bermed on the higher lying areas.	ELO, Contractor	Once off
	Vegetation clearance must be kept to a minimum to reduce the risk of siltation and be in accordance with Eskom Minimum Standard for vegetation management and erosion control.	ELO, Contractor	Once off
	Adequate provision must be made for sanitation for the construction workers. Chemical toilets on site are to be emptied weekly.	Developer, ECO, Contractor	Once off – weekly
	Construction vehicles are to be maintained in good working order, to reduce the probability of leakage of fuels and lubricants. No servicing of vehicles is to be undertaken in close proximity to watercourses.	ELO, Contractor	Once off
	Where construction close to wetland areas will be undertaken, this should be undertaken in the presence and/or in consultation with the ECO & ELO. Note buffer areas of 32m around all water courses and wetlands. A Water Use License will be required to work within this boundary.	ELO, Contractor	Continual
Drainage lines, wetlands, pans	All construction activities must remain within the boundaries of the development area, as demarcated at the start of construction. There should be no vehicular access to the drainage lines outside the development area	ELO, Contractor	Continual
	Wetland areas should be demarcated and marked as “no go “areas	ELO, Contractor, ECO	Continual
	Where soil disturbance associated with construction of the power line occurs in the wetland areas, these areas should be suitably top soiled and re-vegetated with appropriate vegetation as soon as is possible after construction.	ELO, Contractor, ECO	Continual

Activity / issue	Action required	Responsible party	Frequency
	Any wetland areas should be marked and a buffer zone must be established of no disturbance around this species occurrence. Care should be taken during the power line's construction phase to not disturb such areas as much as possible.	ELO, Contractor, ECO	Continual
	No water should be abstracted from any drainage lines, wetlands and pans	ELO, Contractor, ECO	Continual
	No stockpile areas should be located within drainage lines, wetlands and pans, or within the associated buffer zone	ELO, Contractor, ECO	Continual
	No hazardous materials (such as oil) should be kept within 50m of the edge of a wetland buffer zone.	ELO, Contractor, ECO	Continual
	No construction camps should be located within the 1:100 year floodline of a watercourse or a wetland.	ELO, Contractor, ECO	Continual
	No vehicles and access of persons should be allowed through any wetland, except where approved by the relevant authority (DWS)	ELO, Contractor, ECO	Continual
	Any erosion formed during the construction phase or during the vegetation establishment period shall be backfilled and compacted, and the areas restored to an acceptable condition (>80% vegetation cover).	ELO, Contractor	Continual
	Building materials and fuels should be stored in designated areas where contaminated runoff is contained and disposed of in a responsible manner.	ELO, Contractor	Continual
	The clearing, cutting and removal of trees and areas of natural vegetation must be done in consultation with Eskom Environmental office, ECO and the ELO and relevant permit must be obtained and kept on site	ELO, Contractor, ECO	Continual
Destruction of vegetation	All invader plant species must be removed from the site. Communal landscaping within the development must be done with indigenous vegetation.	ELO, Contractor, ECO	Continual
	Collection of firewood from neighbouring properties is strictly prohibited.	ELO, Contractor, ECO	Continual
	No fires may be ignited with the intent to destroy the flora on site and surrounding properties.	ELO, Contractor, ECO	Continual
	Storm water will be managed according to the Eskom Guidelines for Erosion Control and Vegetation Management.	ELO, Contractor	Continual

Activity / issue	Action required	Responsible party	Frequency
Fauna	• All recommendations and mitigation measures provided in the faunal report must be adhered to. • Any animals rescued or recovered will be relocated in suitable habitat away from the power line. • Trees including stumps; bark and holes in trees are vital habitats for numerous arboreal reptiles (chameleons, snakes, agamas, geckos and monitors • The removal of indigenous and protected tree species as well as vegetation clearance must be kept to the minimum area required and remain in the existing servitude wherever possible. All pertinent tree permits for the removal of trees must be obtained from the Department of Agriculture Forestry and Fisheries prior removal • It is recommended that when livestock carcasses appear below a power line, or within close proximity it should be moved to 100m away and preferably be placed near "perchable" trees.	ELO, Contractor, ECO	Continual
Storm water	Onsite treatment will be undertaken through the use of chemical toilets. The toilets will be serviced periodically by the supplier.	ELO, Contractor	Continual
	Adequate Stormwater Management should be implemented as part of the proposed activity to prevent erosion and sedimentation of the surrounding wetlands, floodplains and rivers: • Sheet runoff from access roads should be curtailed; and • Runoff from exposed surfaces should be slowed down by strategic placement of berms.	ELO, Contractor	Continual
Sewage	All solid waste will be collected at a central location at each construction site and will be stored temporarily until removal to an appropriately permitted landfill site in the vicinity of the construction site.	ELO, Contractor	Continual
Solid waste	Diesel generators will be utilised for the provision of electricity if connections are unavailable.	ELO, Contractor	Continual
Electricity	The contractor must make use of local labour where possible in order to stimulate the local economy.	Contractor	Once off

Activity / issue	Action required	Responsible party	Frequency
Recruitment of labour	The contractor must appoint one of his employees to act as an Environmental Liaison Officer. This person will be required to monitor the situation with a direct hands-on approach.	Contractor	Once off
	Eskom and the contractors should maximise the use of local labour where possible by developing a strategy to involve local labour in the contractor teams and construction process.	ELO, Contractor	Once-off
Social	Before construction commences, representatives from the local authority and community-based organisations, as well as neighbouring and/or affected residents should be informed of the details of the construction company (contractor), size of the workforce and construction schedules.	ELO, Contractor	Once-off
	Local sourcing of materials would assist in providing more economic and employment opportunities for the local people.	ELO, Contractor	As necessary
	A specific contact person should be identified to allow community members and property owners to easily direct their queries and concerns and obtain general information regarding the construction process.	ELO, Contractor	Once-off
	Safety and security measures should be discussed with the property owners and local safety and security structures e.g. the local Community Policing Forums.	ELO, Contractor	Once-off
	Limit the movement of construction vehicles in areas where sensitive receptors are situated e.g. schools and pedestrians.	ELO, Contractor	As necessary
	Eskom should keep the construction of access roads to a minimum and rather use the existing infrastructure, as the construction and maintenance of these roads are very costly, impact on the residents' daily living and movement patterns, and create a potential for erosion.	ELO, Contractor	As necessary

OPERATIONAL PHASE EMPr

Table 3: Operational Phase

Activity / issue	Action required	Responsible party	Frequency
General	A maintenance plan for the distribution line must be developed to ensuring that good working order is achieved.	Developer	Once-off
Protection of Sensitive Environments and Natural Features	Alien species of vegetation should be removed from any working areas and the site camp(s). Alien vegetation species should also be eradicated when they begin to establish themselves in disturbed areas (disturbance of the natural vegetation will encourage the establishment of invasive species). In order to discourage the spread of alien species, soil should not be moved from one part of the site to another without the consent of the ECO.	ELO, Contractor, ECO	As necessary
	A monitoring programme should be implemented to enforce the continual eradication of alien and invasive species, especially along wetland and areas corresponding of primary grassland.	Developer	As necessary
	Checks must be carried out at regular intervals to identify areas where erosion is occurring. Appropriate remedial actions, including the rehabilitation of the eroded areas are to be undertaken.	Developer	As necessary
Vegetation	Re-vegetated sites should be monitored for invasion by alien seedlings on a regular basis. Such seedlings should be removed by hand.	Developer	Continuous
	Care must be taken all the time when applying the herbicide to remove aliens	Developer	Continuous
	Screen planting that was specifically established to minimise the intrusiveness of the power line or substation must be maintained and dead or sick plants replaced for a determinate period after construction.	Developer	Continuous
	Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.	Developer	Continuous
	Plants that are not interfering with the operation of the powerline during the maintenance must not be disturbed.	Developer	Continuous

Activity / issue	Action required	Responsible party	Frequency
Health & Safety	An emergency plan (including fire management) must be developed and implemented. Ensure that all fire extinguishers are replaced on or before their expiry dates.	Developer	Continuous
	Site Safety checks should be carried out in accordance with the pertinent Occupational Health and Safety requirements prior to site closure.	Developer	Continuous
	Telephone numbers of emergency services shall be posted conspicuously in the office for use in emergency situations	Developer	Continuous
Social	Conditions stipulated by property owners in terms of the construction activities should be implemented and monitored.	Developer	Continuous
	Where local skills are not available for the operation and maintenance of the line, Eskom should consider capacity building and training to ensure that locals are employable.	Developer	Continuous
	Careful consideration should be given to the tower designs in order to minimise impacts on existing structures and activities on affected properties.	Developer	Continuous
	It is recommended that Eskom implements a skills audit and develops a skills database.	Developer	Continuous
Erosion control	Storm water should be managed according to the Eskom Guidelines for Erosion Control and Vegetation Management.	Developer	Continuous

Mitigation measures recommended by Specialists

Heritage

Although a number of sites of cultural heritage significance were identified in the vicinity of the various proposed power lines and substations, the development would not have an impact on any of them.

If archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage consultant so that an investigation and evaluation of the finds can be made.

Vegetation

Of the three options, the preferred power line route is the best route in terms of its environmental impact. The second best route it that of Alternative 2 and the least preferred one is Alternative 3.

Vegetation and floral management recommendations:

- It is recommended that a walk down of the selected route must take place by a plant ecologist or botanist before the most suitable route is finally surveyed for construction purposes. This is to mark and GPS those individuals of the protected tree species [Marula (*Sclerocarrya birrea*, Ironwood (*Combretum imberbe*) and Shepherd's Tree (*Boscia albitrunca*)]. This is important for permit purposes as well as to damage or out the least number of these protected trees;
- A search and rescue operation must be done before construction commences in order to translocate the any bulbous and succulent plant that could be negatively affected by this proposed development; · In terms of the Forest Act (Act 84 of 1998) permits for the removal or pruning of these abovementioned protected species must be obtained.

Amphibian management recommendations:

- Construction activities of the proposed power line and substation should be restricted to daylight hours reducing the potential impact on the nocturnal breeding activities of the majority of amphibian species. The Giant Bullfrog however breeds during the day;
- Ideally the installation of the new pylons should be undertaken during the dry winter months (May-September) when the majority of amphibian species are dormant;
- Activities around the seasonal streams and dongas must be strictly limited to the 8m servitude;
- No Giant Bullfrogs may be collected for food or illegal pet trade;
- As a precautionary mitigation measure it is recommended that the developer and construction contractor as well as an independent environmental control officer (ECO) should be made aware of the possible presence of certain threatened amphibian species such as the Giant Bullfrog.

Reptile management recommendations:

- No further rock removal should occur adjacent to the new pylons;
- No termite mounds should be intentionally destroyed. If any moribund termite mounds have to be destroyed due to tower position a qualified herpetologist must be present in case any blind snakes are unearthed. The termite mounds should be carefully excavated by hand and pick;
- Any animals rescued or recovered will be relocated in suitable habitat away from the pylon and line;

- Trees including stumps; bark and holes in trees are vital habitats for numerous arboreal reptiles (chameleons, snakes, agamas, geckos and monitors);
- The removal of indigenous tree species as well as vegetation clearance must be kept to the minimum area required and remain in the existing servitude wherever possible. This is especially pertinent for the riparian vegetation along the rivers;
- Cleared vegetation should form wood piles and logs and stumps within the cleared servitude. Dead or decaying wood piles should be created as these will provide valuable refuge areas especially due to the clearance of vegetation cover. Logs and stumps also provide important habitats for several reptile species as well as smaller mammals, amphibians, arachnids and scorpions. With time they will eventually be reduced to valuable compost by several animal species. Dead trees and stumps will also be used for nesting purposes by barbets, hoopoes, owls, hornbills as well as perching or hunting platforms for birds like the kingfisher;
- Any lizards, gecko's, agamids, monitors or snakes encountered should be allowed to escape to suitable habitat away from the disturbance. No reptile should be intentionally killed, caught or collected during any phase of the project;
- Several venomous snake species occur along the study area including Rinkhals (Haemachatus haemachatus), Snouted Cobra (Naja annulifera), Mozambique Spitting Cobra (Naja mossambica), Common or Rhombic Night Adder (Causus rhombeatus), Puff Adder (Bitis arietans); General avoidance of snakes if the best policy if encountered. Snakes should not be intentionally harmed or killed and allowed free movement away from the area; Appropriate foot wear (sturdy leather boots) should be worn in the field;

Bird management recommendations

- No bird flight diverters were noted on the existing transmission lines around the area and should be installed;
- Bird flight diverters shall be ideally be installed along the stream crossings to reduce collision with the new upgraded transmission line and towers;
- Bird flight diverters shall be installed according to Eskom Specifications;
- Several large bird species have been recorded in the area including three species of vulture (White-backed, Cape and Lappet-faced), Martial Eagle, Secretary birds, Yellow- Billed and Black Stork.

Mammal management recommendations

- No hunting or poaching activities must be allowed along the servitudes during all phases of the project;
- Minimal vegetation clearance (restricted to 8m servitude) within the stream crossings.

Management of the seasonal streams

- The proposed powerline development should take place outside the buffer zones that protect the wetlands, drainage lines and streams. Development/construction within 500m of a drainage line requires an application for a water use license to the Department of Water Affairs.
- Storm water infrastructure, especially at the substation site, must be planned in such a way not to affect the donga or wetlands negatively.

6. CONCLUSION

Provided this project for Kgabalatsane Substation and associated power line is mitigated, as per the EMPr, the project will result in limited negative environmental impacts that can be mitigated through implementation of this EMPr. It is the applicant's responsibility to ensure that this EMPr is made binding on the contractor by including the EMPr in the contract documentation. The contractor must thoroughly familiarise himself with the requirements of the EMPr and appoint an environmental liaison officer (ELO) to oversee the implementation of the EMPr on a day-to-day basis.

Parties responsible for transgression of this EMPr should be held responsible for any rehabilitation that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behaviour/negligence should receive penalties.

Key issues

- The Contractor and Developer must continuously apply all the relevant requirements by the OHSA Act and other legislations;
- Proper warning tape (e.g. orange danger nets) must be erected to inform public of the inherent dangers; and
- Should blasting activities be required on certain areas during foundations excavations, it is important the relevant permits be obtained and that the adjacent landowners are informed of these planned activities five days in advance and that site notices informing the public are strategically placed at visible locations.

APPENDIX 1: AN EXAMPLE OF INCIDENT AND ENVIRONMENTAL LOG FOR KGABALATSANE AND WESGLASS PROJECTS

KGABALATSANE PROJECT SITE - ENVIRONMENTAL INCIDENT LOG				
Date	**Environmental Condition**	**Comments** *(Include any possible explanations for current condition and possible responsible parties. Include photographs, records etc. if available)*	**Corrective Action Taken** (*Give details and attach documentation as far as possible)*	**Signature of ECO**

KGABALATSANE PROJECT COMPLAINTS RECORD SHEET	File Ref: Page of ….	DATE: ……

COMPLAINT RAISED BY:
:

CAPACITY OF COMPLAINANT:

COMPLAINT RECORDED BY:

COMPLAINT:

PROPOSED REMEDIAL ACTION:

ECO: _____ Date: _____

NOTES BY ECO:

ECO: _____ Date: _____ Site Manager: _____ Date: _____

Appendix H: Details of EAP and expertise

Name: **MARINDA LE ROUX**
Name of Firm: ENVIROLUTION CONSULTING (PTY) LTD
Position: PROJECT MANAGER & EAP

EDUCATIONAL QUALIFICATIONS

- BA, University of Stellenbosch (Geography, Sociology), 1989
- MTRP (Masters in Town & Regional Planning), University of the Free State, 1992
- EIA Theory & Practice, CEN University of the North West, 2000
- GIS - Operating a vector-based Geographical Information System, UNISA, 2014

PROFESSIONAL REGISTRATION

- Town & Regional Planner: SA Council for Town & Regional Planners (SACPLAN) 1997
- Environmental Assessment Practitioner of South Africa (EAPSA) 2003

EMPLOYMENT EXPERIENCE

ENVIROLUTION CONSULTING

Envirolution Consulting is a specialist consulting company, focussing on Environmental Engineering and Management Consulting.

2014 - PRESENT: PROJECT MANAGER & EAP

Project manager and EAP for the following projects (current/in process):

- Project Manager, Scoping and EIA for 400kV Transmission line between Blanco and Droerivier substations (Eskom) Western Cape
- Project Manager, Scoping and EIA for 400kV Transmission line between Gourikwa and Blanco Droerivier substations (Eskom) Western Cape
- Project Management, Scoping and EIA for K148 Road (Gauteng)
- Scoping & Environmental Impact Assessment (EIA) process for the construction of Route K97 northbound of the N4, Gauteng (GAUTRANS)
- Basic Assessment for the construction of 88kV Distribution Power Line and substation for Diepsloot East-Lulamisa, Gauteng (Eskom)
- Project Manager, BA for erosion measures at JRA roads at Weltevreden (Gauteng)
- Basic Assessment for the expansion of Rainbow Chicken Farms at Bronkhorstspruit, Gauteng (RCF)
- Basic Assessment for the construction of storm water pipelines at Neptune substation at East London, Eastern Cape (Eskom)
- Basic Assessment for the construction of the Wesglas-Kgalabatsane Substation and site servitude for loop out lines, Gauteng (Eskom)
- Basic Assessment for the construction of 132kV Overhead Power Line and Associated Substations for Diepsloot East-Crowthorne -Blue Hills, Gauteng (Eskom)
- Basic Assessment for the Kyalami-Midrand Strengthening Project consisting of a substation and 400kV transmission lines (Eskom)
- Project Manager for Water Use License Application (WULA) for Taunus Diepkloof 40 km 132kv Overhead Line and Two 132kv Substations (Eskom)
- Basic Assessment for the construction of 88kV underground distribution cable from Bluehills Substation to Crowthorne Substation, City of Johannesburg Municipality, Gauteng Province

(Eskom)
- Environmental Compliance Audit of Eskom Kusile Power Station and associated infrastructure (Biannual IFC, CEMP & ROD)

CONSULTANT FOR MARISTO HOLDINGS (PTY) LTD

Maristo Holdings Group, a company mainly tasked with the construction of affordable housing, since 2006. Responsibilities: environmentally related issues, marketing, project management and administration.

2008-2014: ENVIRONMENTAL PROJECT MANAGER

Maristo projects included:
- Low cost housing construction projects in Soshanguve Ext2, Tembisa, Carletonville
- Soweto infrastructure rehabilitation/upgrading Super Block 5
- Basic Assessment and Waste License Application for two landfill sites
- Basic Assessment and Rezoning Application for a filling station
- Rezoning of rezoning of site from Residential I to the land use of "Special Business"
- Rezoning of properties from Residential 1 to Residential III for the purposes of townhouse development, including site design and layout of the proposed units

AECOM/BKS (PTY) LTD

WATER DIVISION - DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

1996– 2008: CHIEF TOWN AND REGIONAL PLANNER

Land use Planning & Environmental Management included the undertaking of EIAs/Scoping applications, EMPs, site audits, strategic planning and project management of the following projects form part of Ms le Roux's experience base:
- Spring Grove transfer scheme
- Wonderboom Airport upgrade EIA: Project manager
- Social Audit of 10 Dams (DWAF)
- Environmental Control Officer & awareness trainer
- for the upgrading of roads
- Upgrading of bulk water pipelines
- Rehabilitation of Lake Mzimgazi
- Formalisation of Cultural and Historical resources in the Nkangala District Municipality
- Catchment Management Plans
- Feasibility investigation for Flow Monitoring at the Cowles Dam
- ELURP Timber Siding EIA
- Dams in Sofala Province, Mozambique
- Modder/Riet River Water Management Plan
- Upgrading of the RBA sanitation facilities
- Lady Selborne Township development, Tswhane
- Kampala (Uganda): Drainage Master Plan Project,
- Blantyre, Malawi: report writing for water supply project
- Upgrading of Nylstroom/Modimolle bulk sewer pipeline
- New residential township, Phagameng
- Cape Town Metropolitan Council (CMC): Coastal Park Landfill Site –EMP & contractors' specs
- Ethiopia Hydropower Supply Project Report
- Nandoni Dam Relocation Action Plan: Budeli and Molenzhe
- Khutsong (Carletonville - new cemetery.
- Lydenburg upgrading of the water treatment works
- Leboeng WWTW, community centre and treatment works
- Mphanama Sekukhuneland water supply system
- Olifants River Environmental Water Requirements
- N3 Toll Road Project from Heidelberg to Cedara (strategy)

- N4 SA Truck load control: weigh bridges and lay-byes
- N4 Mozambique Truck load control weigh bridges and lay-byes, discussions with Mozambican environmental officials
- Algoa Water Augmentation Project
- Environmental screening of Kouga River, Guerna Dam
- Olifants/Doring Rivers Water Augmentation: Western Cape
- Paternoster, Western Cape: sewage Treatment Works
- Coega Port and Integrated Transport Study
- De Deur Sub-regional Cemetery
- Lowveld Taxi Investigations for the EGSC
- Cemetery Attitude Study - EGSC
- Khayalami Metro Cemetery and Crematorium Land Development Objectives (LDO'S)
- Southern Areas Sub-Regional Cemetery Facilities, for EGSC, including identification of suitable land, liaison with Council, role players and community representatives
- Highveld Passenger Transportation Plan Mpumalanga Province: Input and recommendations on integration and planning of transport services and facilities for HDC
- Hammanskraal-Pretoria Corridor for the Eastern Gauteng Services Council
- Study, policy formulation, future planning proposals, marketing and presentations on Cemetery Planning and Management for the Department of Parks and Recreation of the City of Bloemfontein, Free State
- Ponta D'Oura to Salamanga: road rehabilitation project in Mozambique
- LDOs for the Pietersburg/Polokwane TLC re Cemetery and Crematorium functions
- Land-use planner input into National Noise Control Policy for the Airports Company
- Marketing of Department of Environmental Planning, preparation of tender documents, expression of interest and project proposals on a continuous base.

FREE STATE PROVINCIAL GOVERNMENT:

DEPARTMENT OF HOUSING DIVISION OF LAND USE PLANNING

1993 TO 1996: TOWN AND REGIONAL PLANNER

- Kroonstad and Viljoenskroon: Removal of restrictions, consolidations, subdivisions of farm and urban land, permit applications
- Sasolburg: Consolidations, removal of restrictions, subdivisions, rezoning, alterations to Scheme specifications
- Parys: Consolidations, removal of restrictions, subdivisions, rezoning, alterations to General Plan specifications
- Deneysville: Consolidations, removal of restrictions, subdivisions, rezoning
- Zamdela: Settlement planning, consolidations, removal of restrictions, subdivisions, rezoning and alterations to General Plan No. 19/1986.
- Metsimaholo: Layout planning, consolidations, removal of restrictions, subdivisions, rezoning, alterations to layout plan
- Vredefort: Consolidations, removal of restrictions, subdivisions, rezoning, permanent street closure Kragbron: Layout Planning 570 erven
- Tlholong: Layout Planning 298 erven of Extension 3
- Tumahole: Consolidations, removal of restrictions, subdivisions, rezoning, layout plan alterations
- Bultfontein: Compilation of Urban Structure Plan for Bultfontein, Phahameng and surroundings, including high level talks and public participation
- Welkom: Closing of Park erven, consolidation and subdivision
- Refengkgotso, Kwakwatsi, Mokwallo, Rummulotsi, Masilo & Monyakeng 1993 to 1996: Informal settlement planning & evaluation of geotechnical reports.

Appendix I: Specialist's declaration of interest (included in specialist reports)