Eskom Holdings (SOC) Ltd – Gauteng Operating Unit



DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED CONSTRUCTION OF THE DIAMOND-BYNES (BOSCHKOP) 132KV POWERLINE WITHIN THE CITY OF TSHWANE METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE

J34156 DEA REF: 14/12/16/3/3/1/1359

ORIGINAL

April 2015

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environmental affairs

Department: Environmental Affairs REPUBLIC OF SOUTH AFRICA

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File Reference Number: Application Number: Date Received:

200 Only)		

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 September 2012**. 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 on 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
	Х

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

GIBB (Pty) Ltd (GIBB) has been appointed by Eskom Holdings SOC Ltd, Eskom Distribution – Gauteng Operating Unit (Eskom) to undertake an environmental authorisation process in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended (NEMA) and the Environmental Impact Assessment Regulations of 2010 for the construction of the proposed 132kV powerline from the newly proposed Diamond Substation connecting to the existing Bynes 132kV powerline in Boschkop, City of Tshwane Metropolitan Municipality (CTMM), Gauteng Province (refer to **Figure 1 & Appendix A**). A 500m corridor has been assessed along each of the proposed routes to determine the environmental impacts and significance of these impacts associated with the proposed development. Eskom has applied for environmental authorisation from the National Department of Environmental Affairs (DEA), Reference number: **14/12/16/3/3/1/1359**.

Study Area:

Alternative 1:

At a regional level, the study area lies within the Gauteng Province and is situated within the Boschkop community, CTMM. Two (2) route and two (2) substation site alternatives exist for the proposed Diamond-Bynes 132kV powerline and associated Diamond substation with an approximate distance of 5.5km. Each one of the route alternatives constitute four (4) different options in terms of connecting to each one of the proposed substation sites.

Alternative 1 (a) connects from the existing Bynes 132kV powerline in the east and extends in a south-westerly direction for approximately 400m before it reaches the N4 national road. From there the alignment changes direction to follow the existing N4 alignment in a north-westerly direction for approximately 4.2km. The alignment then changes direction for the last time and extend in a northerly direction for approximately 800m before it connects to the *Diamond substation Alternative 1*. The alphabetical numbering applicable to this alternative is A, B, C, D, E, F, G.

Alternative 1 (b) connects from the existing Bynes 132kV powerline in the east and extends in a south-westerly direction for approximately 400m before it reaches the N4 national road. From there the alignment changes direction to follow the existing N4 alignment in a north-westerly direction for approximately 3.4km. The alignment then changes direction and extends in a northerly direction for 250m before it changes direction again and extends for a further 1.4km before it connects to the *Diamond substation Alternative 1*. The alphabetical numbering applicable to this alternative is A, B, C, D, H, F, G.

Alternative 1 (c) connects from the existing Bynes 132kV powerline in the east and extends in a south-westerly direction for approximately 400m before it reaches the N4 national road. From there the alignment changes direction to follow the existing N4 alignment in a north-westerly direction for approximately 4.2km. The alignment then changes direction and extends in a northerly direction for approximately 500m before changes direction for the last time and extends in a westerly direction for a further 500m before it connects to the *Diamond substation Alternative 2*. The alphabetical numbering applicable to this alternative is A, B, C, D, E, F, I.

Alternative 1 (d) connects from the existing Bynes 132kV powerline in the east and extends in a south-westerly direction for approximately 400m before it reaches the N4 national road. From there the alignment changes direction to follow the existing N4 alignment in a north-westerly direction for approximately 3.4km. The alignment then changes direction and extends in a northerly direction for 250m before it changes direction again and extends for a further 1.6km before it connects to the *Diamond substation Alternative 2*. The alphabetical numbering applicable to this alternative is A, B, C, D, H, F, I.



Image indicating the alphabetic numbering relevant to the proposed route alignment alternatives.

Alternative 2 (preferred alternative):

Alternative 2 (a) connects from the existing Bynes 132kV powerline in the east and extends in a south-westerly direction for approximately 1km before it reaches the N4 national road. From there the alignment changes direction to follow the existing N4 alignment in a north-westerly direction for approximately 2.5km. The alignment then changes direction and extends in a northerly direction for 250m before it changes direction again and extends for a further 1.4km before it connects to the *Diamond substation Alternative 1*. The alphabetical numbering applicable to this alternative is J, C, D, H, F, G.

Alternative 2 (b) connects from the existing Bynes 132kV powerline in the east and extends in a south-westerly direction for approximately 1km before it reaches the N4 national road. From there the alignment changes direction to follow the existing N4 alignment in a north-westerly direction for approximately 3.4km. The alignment then changes direction for the last time and extend in a northerly direction for approximately 800m before it connects to the *Diamond substation Alternative 1*. The alphabetical numbering applicable to this alternative is J, C, D, E, F, G.

Alternative 2 (c) connects from the existing Bynes 132kV powerline in the east and extends in a south-westerly direction for approximately 1km before it reaches the N4 national road. From there the alignment changes direction to follow the existing N4 alignment in a north-westerly direction for approximately 2.5km. The alignment then changes direction and extends in a northerly direction for 250m before it changes direction again and extends for a further 1.6km before it connects to the *Diamond substation Alternative 2*. The alphabetical numbering applicable to this alternative is J, C, D, H, F, I.

Alternative 2 (d) connects from the existing Bynes 132kV powerline in the east and extends in a south-westerly direction for approximately 1km before it reaches the N4 national road. From there the alignment changes direction to follow the existing N4 alignment in a north-westerly direction for approximately 3.4km. The alignment then changes direction and extends in a northerly direction for 500m before it changes direction again and extends for a further 400m before it connects to the *Diamond substation Alternative 2*. The alphabetical numbering applicable to this alternative is J, C,

D, E, F, I.

Please refer to the image below for a visual illustration of the alternatives and their respective alphabetical order per alignment.

The proposed project involves the construction of:

- An approximate 20 km 132kV overhead distribution powerline from the newly proposed Diamond Substation connecting to the existing Bynes 132kV powerline;
- Construction of the newly proposed Diamond Substation.

Based on the proposed route and nature of the project, several watercourse features will be crossed by the 132kV powerline and as such a water use licence application (WULA) must be undertaken for the project.

It should be noted that the main purpose of the proposed powerline is to strengthen the existing electricity supply in the area, and as such provide the area with adequate and reliable power supply to meet current and future demands.



Figure 1: Diamond-Bynes 132kV powerline locality map indicating route Alternative 1 (black line) and route Alternative 2 (blue line - preferred) along with the respective substation alternatives (red dots)

132kV Monopole Structures:

The structures proposed for this project is the single circuit steel mono-poles (**Figure 2**). These mono-pole structures will comprise the following characteristics:

- The footprint for the mono-pole structures is between **0.5 m² and 8m²** in size;
- The mono-pole structures will be buried to a depth of between **2m** and **3.6m**;
- The height of the mono-pole structures will range between 18m and 30m;
- The span lengths between the mono-pole structures will vary on average between **30m** and **350m** depending on terrain. Span lengths can be to a maximum of 350m if the topography allows for this. These variations are due to a number of factors including the structure, the

- terrain, ground clearance requirements, topology and geology; and
- The operation and construction servitudes will be **31.0m** (i.e. **15.5m** on either side of the centre line).



Figure 2: Single circuit steel mono-pole structures to be used for the Pylon structures

In addition to this, various tower types can be used depending on the terrain and powerline profile. These tower types constitute the following:

- Mono-pole guyed intermediate suspension structures;
- Mono-pole self-supporting intermediate suspension structures;
- Mono-pole angle strain structures;
- Mono-pole intermediate strain structures;
- H-Pole structures; and
- 3 Pole strain structures.

The pylons will be steel and the average span between two towers can vary between 30m and 350m depending on the ground profile and the terrain it covers. The size of the foundation footprint is related to the soil type and structure to be used. The steel mono-pole structure has a concrete cap at the foot of each steel mono-pole structure (**Figure 3**) with a diameter ranging between 1.2m to 2m and 0.5m deep.



Figure 3: Single circuit steel mono-pole structures to be used for the Pylon structures

It is proposed that the Steel Mono-pole structures will be used along with strain structures located in between them, depending on the terrain. Please note that this will be finalised prior to construction. Refer to **Appendix C** for illustrations of the type of pylon structures that are under consideration.

Servitude Requirements and Clearances:

The servitude width for a 132kV distribution line is 31m (15.5m on either side of the centre line of the powerline). The minimum vertical clearance to buildings, poles and structures not forming part of the powerline must be 3.8 m, while the minimum vertical ground clearance is 7.5m in urban areas and 10.5m for national road crossings. The minimum distance of a 132 kV distribution line running parallel to proclaimed public roads is 95m 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 132kV distribution line must be 3.8m 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. Table 1 summarizes some of the key clearances relevant to the proposed 132kV powerline.

Table 1:	Clearance	specifications	(Eskom,	2007)
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Clearances	Minimum Clearance Distance (m)
Ground clearance	6.3
Building structures not part of powerline	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 positive environmental authorisation from the 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 in, and appropriate management

actions incorporated into the periodically updated Environmental Management Programme (EMPr).

Trees and large shrubs causing clearance issues will be trimmed or cleared. If any tree or shrub in other areas interferes with the operation and/or reliability of the distribution line it will be trimmed or completely cleared. In areas where distribution lines cross existing orchards 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. Clearing of vegetation will take place along approved profiles and in accordance with the approved EMPr and the **Eskom Vegetation Management Standard 240-52456757**.

Access:

Access is required during both the construction and operation/maintenance phases of the powerline's life cycle. Access to the 132kV powerline will be confined to the powerline servitude itself and existing access roads and tracks will be used to gain access to construction sites and the servitude. Therefore, transportation activities for construction (construction material and teams) and maintenance activities will make use of both existing access roads and the power line servitude.

It should be noted that there are existing tracks and access roads in and around the vicinity of the powerline for majority of the route. Where it is not possible to use existing tracks, transportation will occur along the approved powerline servitude.

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). Guided Strain structures require smaller foundations for support than in-line suspension structures, which contribute to the cost of the construction of the line. Foundations will be mechanically excavated then a layer of concrete is cast at the bottom of the foundation. It will then be back filled with soil/ cement mixture and then compacted in layers 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 200m 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 to a level of 200mm above ground level.

Insulators:

Composite insulators have a glass-fibre core with silicon sheds for insulation and are used to insulate the conductors from the towers. Glass and porcelain have been used to insulate the conductors for many years, and is the most common. These products are, however, heavy and susceptible to damage 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 weathershed material will be used.

Construction Process for distribution lines:

The powerlines will be 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: Pegging of structures;

Step 9: Vegetation clearance and construction of access roads (where required);

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; and

Step 15: Continued maintenance.

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; and

Step 11: Continued maintenance.

Stringing of Conductors:

Tension stringing gear is used to string the conductors between towers. The line is strung in sections (from bend to bend). Cable drums are placed at the beginning of the sections of the line 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.

Construction Period:

An estimated construction period of 12-18 months is envisaged. The construction period will however depend on the season and environmental conditions in which construction is undertaken and may be fast tracked.

On-going Maintenance:

During the life span of the powerlines, which is approximately 25 years, on-going maintenance will be performed from time to time. Eskom maintenance staff and contractors employed by Eskom will undertake the maintenance works as required.

Details of the EAP

GIBB (Pty) Ltd. (GIBB) is an integrated group of scientists, project managers, engineers and architects providing cost-effective solutions and specialist services in a wide range of disciplines. The multi-disciplinary consulting, management and design approach allows for the execution of projects in a holistic way, as this is believed to be the best approach to fully meet the needs of our Clients.

The GIBB Environmental Services Division has a formidable track record and comprises highly qualified and experienced technical staff viz, environmental scientists, environmental engineers and geologists that collectively form the national environmental team. The team members have broad experience in terms of working on a range of environmental projects within the public and private sector. Refer to the Table below for the EAP and environmental scientist details.

Project EAP:	Umeshree Naicker		
Contact Person:	GIBB (Pty) Ltd		
Physical Address:	14 Eglin Road, Sunninghill		
Postal Address:	P.O. Box 2700, Rivonia		
Postal code:	2128	Fax:	011 807 5670

Telephone:	011 519 4701	Cell:	
Email:	unaicker@gibb.co.za		
Expertise to conduct EIA:	Umeshree Naicker is a syears of experience in the key experience includes Environmental Impact Rep Liaison. She also has ex Officer. She has worked renewable energy sector.	senior e e enviror s Proje porting, perience extensi	environmental scientist with six imental management field. Her ct management, Scoping & Basic Assessments, and Client e as an Environmental Control vely in South Africa within the

Environmental Scientist	Alécia Barnard		
Physical Address:	Block A, 1st Floor, East Wing, Lynnwood Corporate Park, 36 Alkantrant Road, Lynnwood 0081		
Postal Address:	PO Box 35007, Menlo Par	k	
Postal code:	0102	Fax:	012 348 5878
Telephone:	012 348 5880	Cell:	
Email:	albarnard@gibb.co.za		
Expertise to conduct EIA:	Alecia Barnard is an envi- half years of experience in Her key experience inco Participation Process, En- Environmental Impact Re Use Licenses, Waste M Licenses and Section 24G	vironme the en cludes l nvironm eporting lanagem Applica	ntal assistant with three and a vironmental management field. Project administration, Public ental site Audits, Scoping & , Basic Assessments, Water nent Licenses, Air Emissions ations.

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 that triggers listed activity – if activities in GN R. 546 are triggered, indicate the triggering criteria as described in the second column of GN R. 543		
e.g. GN R.544 Item XX(x): The construction of a bridge within 32m of a water course	e.g. A bridge measuring 5m in height and 10m in length, no wider than 8 meters will be built over the Vaal river		
 GN R.544 Item 10(i): The construction of facilities or infrastructure for the transmission and distribution of electricity – (i) Outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts;- 	The proposed Diamond-Bynes distribution line and associated substation will be 132kV.		
GN R.544 Item 11(xi): The construction of: (xi) infrastructure or structures covering 50	Several watercourses may be crossed along the powerline route, and as such pylons may be constructed within 32 metres of the watercourse.		
square metres or more Where such construction occurs within a			

watercourse or within 32 metres of watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.	
GN R.544 Item 22(ii): The construction of a road, outside urban areas,	Access road may be required at certain sections to access the powerline.
(ii) Where no reserve exists where the road is wider than 8 metres.	
GN R.544 Item 23(ii): The transformation of undeveloped, vacant or derelict land to-	The proposed Diamond substation is located outside the urban edge and size of the proposed substation will be approximately 1,5 hectares.
(ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares.	
GN R.546 Item 4(b)(i)(iii)(viii): The construction of a road wider than 4 metres with a reserve less than 13,5 metres. (b) In Gauteng:	Access roads may be required along certain sections to access the powerline within Gauteng, where such roads and powerline alignments may extend through sensitive, protected and protected areas.
(i) A protected area identified in terms of NEMPAA, excluding conservancies;	
(iii) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;	
(viii) Any declared protected area including Municipal or provincial Nature Reserves as contemplated by the Environment Conservation Act, 1989 (Act No. 73 of 1989) and the Nature Conservation Ordinance (Ordinance 12 of 1983);	
GN R.546 Item 12(b):	Vegetation clearance would be required for the proposed construction of the Diamond-Bynes 132kV powerline.
The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation.	which extends through an identified Critical Biodiversity Area.
(b) Within a critical biodiversity areas identified in bioregional plans;	
GN R.546 Item 14(a)(i):	Vegetation will be cleared to allow for the erection of the pylons. Bush clearing of approximately 16m wide (8m on

The clearance of an area of 5 hectares or more of	either sides of the powerline) will be required for the
vegetation where 75% or more of the vegetative	132kV powerline.
cover constitutes indigenous vegetation, except	
where such removal of vegetation is required for:	
(1) purposes of agriculture or afforestation	
inside areas identified in spatial instruments	
adopted by the competent authority for	
(2) the undertaking of a process or activity	
included in the list of waste management	
activities published in terms of section 19 of	
the National Environmental Management:	
Waste Act, 2008 (Act No. 59 of 2008) in	
which case the activity is regarded to be	
excluded from this list;	
(3) the undertaking of a linear activity falling	
below the thresholds in Notice 544 of 2010.	
(a) In Eastern Cana, Erea State, KwaZulu Natal	
Gautena Limpopo Moumalanda Northern Cape	
Northwest and Western Cape:	
(i) All areas outside urban areas.	

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.

DESCRIPTION OF ALTERNATIVES:

Two (2) route and two (2) substation site alternatives exist for the proposed Diamond-Bynes 132kV powerline and associated Diamond substation with an approximate distance of 5.5km.

Each one of the route alternatives constitute four (4) different options in terms of connecting to each one of the proposed substation sites.

ROUTE ALTERNATIVES

Route Alternative 1:

Route Alternative 1 (a) connects from the existing Bynes 132kV powerline and extends in a southwesterly direction for approximately 400m before it reaches the N4 national road. From there the alignment changes direction to follow the existing N4 alignment in a north-westerly direction for approximately 4.2km. The alignment then changes direction for the last time and extend in a northerly direction for approximately 800m before it connects to the *Diamond substation Alternative 1*. The alphabetical numbering applicable to this alternative is A, B, C, D, E, F, G.

Route Alternative 1 (b) connects from the existing Bynes 132kV powerline and extends in a southwesterly direction for approximately 400m before it reaches the N4 national road. From there the alignment changes direction to follow the existing N4 alignment in a north-westerly direction for approximately 3.4km. The alignment then changes direction and extends in a northerly direction for 250m before it changes direction again and extends for a further 1.4km before it connects to the *Diamond substation Alternative 1*. The alphabetical numbering applicable to this alternative is A, B, C, D, H, F, G.

Route Alternative 1 (c) connects from the existing Bynes 132kV powerline and extends in a southwesterly direction for approximately 400m before it reaches the N4 national road. From there the alignment changes direction to follow the existing N4 alignment in a north-westerly direction for approximately 4.2km. The alignment then changes direction and extends in a northerly direction for approximately 500m before changes direction for the last time and extends in a westerly direction for a further 500m before it connects to the *Diamond substation Alternative 2*. The alphabetical numbering applicable to this alternative is A, B, C, D, E, F, I.

Route Alternative 1 (d) connects from the existing Bynes 132kV powerline and extends in a southwesterly direction for approximately 400m before it reaches the N4 national road. From there the alignment changes direction to follow the existing N4 alignment in a north-westerly direction for approximately 3.4km. The alignment then changes direction and extends in a northerly direction for 250m before it changes direction again and extends for a further 1.6km before it connects to the *Diamond substation Alternative 2*. The alphabetical numbering applicable to this alternative is A, B, C, D, H, F, I.

Route Alternative 2 (preferred alternative:

Route Alternative 2 (a) connects from the existing Bynes 132kV powerline and extends in a southwesterly direction for approximately 1km before it reaches the N4 national road. From there the alignment changes direction to follow the existing N4 alignment in a north-westerly direction for approximately 2.5km. The alignment then changes direction and extends in a northerly direction for 250m before it changes direction again and extends for a further 1.4km before it connects to the *Diamond substation Alternative 1*. The alphabetical numbering applicable to this alternative is J, C, D, H, F, G.

Route Alternative 2 (b) connects from the existing Bynes 132kV powerline and extends in a southwesterly direction for approximately 1km before it reaches the N4 national road. From there the alignment changes direction to follow the existing N4 alignment in a north-westerly direction for approximately 3.4km. The alignment then changes direction for the last time and extend in a northerly direction for approximately 800m before it connects to the *Diamond substation Alternative 1*. The alphabetical numbering applicable to this alternative is J, C, D, E, F, G.

Route Alternative 2 (c) connects from the existing Bynes 132kV powerline and extends in a southwesterly direction for approximately 1km before it reaches the N4 national road. From there the alignment changes direction to follow the existing N4 alignment in a north-westerly direction for approximately 2.5km. The alignment then changes direction and extends in a northerly direction for 250m before it changes direction again and extends for a further 1.6km before it connects to the *Diamond substation Alternative 2*. The alphabetical numbering applicable to this alternative is J, C, D, H, F, I.

Route Alternative 2 (d) connects from the existing Bynes 132kV powerline and extends in a southwesterly direction for approximately 1km before it reaches the N4 national road. From there the alignment changes direction to follow the existing N4 alignment in a north-westerly direction for approximately 3.4km. The alignment then changes direction and extends in a northerly direction for 500m before it changes direction again and extends for a further 400m before it connects to the *Diamond substation Alternative 2*. The alphabetical numbering applicable to this alternative is J, C, D, E, F, I.

GPS coordinates for both alternative routes has been provided in Appendix A2.

SUBSTATION SITE ALTERNATIVES

Diamond Substation Alternative 1

The Diamond Substation Alternative 1 constitutes an approximate size of 1.5ha and is located north of the R104 (Bronkhorstspruit road). In order to access this substation site, an existing informal dirt road extending north from the R104 for an approximate distance of 0.6km will be used.

Diamond Substation Alternative 2

The Diamond Substation Alternative 2 constitutes an approximate size of 1.5ha and is located south of the R104 (Bronkhorstspruit road). In order to access this substation site, an existing informal dirt road (located south of the R104) which extends in a western direction parallel to the R104 for an approximate distance of 0.4km will be used.

Topography, hydrology, land ownership, servitude negotiations, line maintenance, socio-economic and environmental aspects were considered during the assessment of each route and substation alternative as shown in **Section D** below.

Please refer to Figure 4 below which outlines both routes and substation alternatives.

BASIC ASSESSMENT REPORT





Site alternatives a)

Alternative 1		
Description	Lat (DDMMSS)	Long (DDMMSS)
Diamond Substation Alternative 1	25°46'6.15"S	28°26'30.94"E
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
Diamond Substation Alternative 2	25°46'6.69"S	28°26'8.92"E

In the case of linear activities:

Alternative:	Latitude (S):	Longitude (E):
Alternative S1 (a)		
 Starting point of the activity T-off from the existing Bynes 132kV powerline 	25°46'56.96"S	28°29'10.67"E
Bend 1	25°47'3.99"S	28°28'59.22"E
• Middle/Additional point of the activity	25°46'35.83"S	28°27'30.76"E
Bend 2	25°46'43.01"S	28°28'23.44"E
Bend 3	25°46'27.33"S	28°26'36.23"E
Bend 4	25°46'11.98"S	28°26'25.99"E
End point of the activity Connection to the newly proposed Diamond Substation Alternative 1	25°46'6.15"S	28°26'30.94"E
Alternative S1 (b)		

Alternative 51 (b)

Please note that Alternative 1(b) has the same starting point and ending point as Alternative 1 (a) and follow the same alignment up until Bend 2. Coordinates for the bends following Bend 2 is provided in the section below.

PLEASE REFER ABOVE

25°46'35.83"S

25°46'23.72"S

25°46'11.42"S

25°46'6.15"S

- Starting point of the activity until Bend 2 is the same as for Alternative 1(a) above
- Middle/Additional point of the activity
- Bend 3
- Bend 4 End point of the activity Connection to the newly proposed **Diamond Substation Alternative 1**

Alternative S1 (c)

Please note that Alternative 1(c) follows the same alignment as Alternative 1(a) up until Bend 4. Coordinates for the bends following Bend 2 is provided in the section below.

- Starting point of the activity until Bend 4 is the same as for Alternative 1(a) above
- Middle/Additional point of the activity
- End point of the activity Connecting to the newly proposed Diamond Substation Alternative 2

PLEASE REFER ABOVE	
25°46'35.83"S	28°27'30.76"E
25°46'6.69"S	28°26'8.92"E

28°27'30.76"E

25°46'11.42"S

28°26'30.94"E

28°27'5.86"E

Alternative S1 (d)

Please note that Alternative 1(d) follows the same alignment as Alternative 1(a) up until Bend 2. Coordinates for the bends following Bend 2 is provided in the section below.

- Starting point of the activity until Bend 2 is the same as for Alternative 1(a) above
 PLEASE REFER ABOVE
- Middle/Additional point of the activity
- Bend 3
- Bend 4
- End point of the activity
 Connecting to the newly proposed
 Diamond Substation Alternative 2

25°46'35.83"S	28°27'30.76"E
25°46'23.72"S	28°27'5.86"E
25°46'11.42"S	25°46'11.42"S
25°46'6.69"S	28°26'8.92"E

Alternative S2 (a) (preferred alternative)

- Starting point of the activity
 T-off from the existing Bynes 132kV
 powerline
- Bend 1
- Bend 2
- Bend 3
- Bend 4
- Middle/Additional point of the activity
- Bend 5
- Bend 6
- End point of the activity
 Connection to the newly proposed
 <u>Diamond Substation Alternative 1</u>

25°46'36.53"S	28°29'4.75"E
25°46'44.08"S	28°28'47.17"E
25°46'44.36"S	28°28'38.29"E
25°46'48.41"S	28°28'35.45"E
25°46'43.01"S	28°28'23.44"E
25°46'35.83"S	28°27'30.76"E
25°46'31.87"S	25°46'31.87"S
25°46'23.71"S	28°27'5.87"E
25°46'6.15"S	28°26'30.94"E

Alternative S2 (b)

Please note that Alternative 2(b) follows the same alignment as Alternative 2(a) up until Bend 4. Coordinates for the bends following Bend 4 is provided in the section below.

- Starting point of the activity until Bend 4 is the same as for Alternative 2(a) above
- Middle/Additional point of the activity
- Bend 5
- Bend 6
- End point of the activity
 Connection to the newly proposed
 Diamond Substation Alternative 1

PLEASE REFER ABOVE	
25°46'35.83"S	28°27'30.76"E
25°26'27.10"S	28°26'36.30"E
25°46'11.98"S	28°26'26.00"E
25°46'6.15"S	28°26'30.94"E

Alternative S2 (c)

Please note that Alternative 2(c) follows the same alignment as Alternative 2(a) up until Bend 6. Coordinates for the bends following Bend 6 is provided in the section below.

- Starting point of the activity until Bend 6 is the same as for Alternative 2(a) above
 PLEASE REFER ABOVE
- Middle/Additional point of the activity
- End point of the activity
 Connecting to the newly proposed
 <u>Diamond Substation Alternative 2</u>

25°46'35.83"S	28°27'30.76"E
25°46'6.69"S	28°26'8.92"E

Alternative S2 (d)

Please note that Alternative 2(d) follows the same alignment as Alternative 2(a) up until Bend 4. Coordinates for the bends following Bend 4 is provided in the section below.

- Starting point of the activity
- until Bend 4 is the same as for Alternative 2(a) above
- Middle/Additional point of the activity
- Bend 5
- Bend 6
- End point of the activity
 Connecting to the newly proposed
 Diamond Substation Alternative 2

25°46'35.83"S	28°27'30.76"E	
25°46'27.22"S	28°26'36.34"E	
25°46'10.81"S	28°26'25.24"E	
25°46'6.69"S	28°26'8.92"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.

REFER TO APPENDIX A2 FOR GPS CO-ORDINATES TAKEN EVERY 500m.

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**.

b) Lay-out alternatives – N/A

Layout alternatives are not applicable to the construction of the proposed Pelly-Fairfield 132kV powerline.

c) Technology alternatives – N/A

Alternative technologies have not been considered as the technology to be used is already 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 international best practice. The pylons under consideration for this project are the most appropriate based on the terrain and design integrity as well as for the purpose for which the powerline is to be constructed.

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

No other alternatives have been considered

e) No-go alternative

The No-go alternative in the context of this project implies that the powerline is not to be constructed. If the project does not proceed, the potential negative impacts related to the risk of collisions of birds, clearing of vegetation, soil erosion and wetland degradation would be avoided. The surrounding area will however, will be negatively affected due to the lack of a constant and reliable electricity supply. This will directly inhibit future developments and economic growth in the area. The need for stable and reliable power supply to meet current and future demand will outweigh the potential impacts to the surrounding environment. The impacts to the surrounding environment can be proactively mitigated to acceptable levels.

The No-Go Alternative is therefore not recommended.

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):

Alternative:	Size of the activity:
Alternative A1 ¹	1,500m ²
Diamond Substation 1	
Alternative A2	1,500m ²
Diamond Substation 2	
or, for linear activities:	
Alternative:	Length of the activity:
Alternative S1 (a))	5.4km
Alternative S1 (b)	5.3km
Alternative S1 (c)	5.6km
Alternative S1 (d)	5.6km
Alternative S2 (a) (preferred activity	5km
alternative)	
Alternative S2 (b)	5.1km
Alternative S2 (c)	5.3km
Alternative S2 (d)	5.4km

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

Alternative:	Size site/servite	of ude:	the
Alternative 1 (a)	167,400 m	n ²	
Alternative 1 (b)	164,300 m	n ²	
Alternative 1 (c)	173,600 m	n ²	
Alternative 1 (d)	173,600 m	n ²	
Alternative 2 (a) (preferred activity alternative)	155,000 m	n ²	
Alternative 2 (b)	158,100 m	n ²	

¹ "Alternative S" refers to site alternatives.

Alternative 2 (c) Alternative 2 (d)

4. SITE ACCESS

Does ready access to the site exist?

If NO, what is the distance over which a new access road will be built

Describe the type of access road planned:

Due to the close proximity of distribution powerlines in the area, existing roads and tracks will be used during construction and maintenance activities. Where no access roads exist in close proximity to the proposed powerline route, temporary maintenance tracks will be created for the construction of the powerline. Please note that as far as possible all impacting activities will take place within the servitude for the approved powerline alignment. The approved servitude will in this instance be utilised for the construction of the powerline and also to allow the maintenance team to gain access to the proposed line itself once constructed for on-going maintenance. These tracks will as far as possible follow the powerline servitude and not entail the construction of formal roads.

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.

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 anv:
- 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).

LAYOUT/ROUTE PLAN 6.

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;

YES	NO
Х	
m	

164,300 m² 167,400 m²

- 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 X	NO	Please explain

The powerline and structures will be located in a servitude area that will be registered by Eskom upon completion of landowner consideration negotiations.

2.	Will the activity be in line with the following?			
	(a) Provincial Spatial Development Framework (PSDF)	YES X	NO	Please explain

The Gauteng Provincial Spatial Development Framework (GSDF) was completed in February 2011 and is valid from the date of approval. The GSDF draws upon and aims to give effect to the vision put forward in the Gauteng Employment Growth and Development Strategy (GEGDS), namely building a prosperous, sustainable growing provincial economy to eradicate poverty and improve social development. Ensuring the sustainability of the resource base upon which the general wellbeing of the people of Gauteng depend.

The GSDF was prepared in accordance with the principles of bioregional planning adapted to suit the requirements of Gauteng. Gauteng has the largest population in the country and the construction of the proposed powerline will have a positive impact on the local economy and growing population of the area. This is due to the provision of consistent and reliable supply electricity to the surrounding area which promotes economic growth. The economic growth in the local communities in the area is much needed as members of the community will directly benefit from the job opportunities created.

The Gauteng Provincial Spatial Development Plan recognises that the electricity supply is under stress in the province and large development projects are affected by the electricity limitations.

(b) Urban edge / Edge of Built environment for the area	YES	NO X	Please explain
	I		

The City of Tshwane Metropolitan Municipality (CTMM) was established on 5 December 2000 when the following local authorities which had previously served the greater Pretoria and surrounding areas were integrated. The following local authorities were amalgamated:

- The Greater Pretoria Metropolitan Council
- The City Council of Pretoria
- The Town Council of Centurion
- The Northern Pretoria Metropolitan Substructure
- The Hammanskraal Local Area Committee
- The Eastern Gauteng Services Council
- The Pienaarsrivier Transitional Representative Council
- The Crocodile River Transitional Council
- The Western Gauteng Services Council
- The Winterveld Transitional Representative Council
- The Temba Transitional Representative Council
- The Mabopane Transitional Representative Council
- The Ga-Rankuwa Transitional Representative Council
- The Eastern District Council

Following the integration of the abovementioned local authorities to form part of the CTMM, the municipality was classified as a Category A Grade 6 urban municipality. The Municipality includes the following towns and townships: Pretoria, Centurion, Akasia, Soshanguve, Mabopane, Atteridgeville, Ga-Rankuwa, Winterveld, Hammanskraal, Temba, Pienaarsrivier, Crocodile River and Mamelodi. It serves a geographical area of 6,298 km² and has a population of 2,921,488 with an average of approximately 464 people per km².

The proposed development will take place outside the urban edge.

(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 X	NO	Please explain
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The Integrated Development Plan (IDP) is the over-arching strategic plan of the City of Tshwane Local Municipality (CTTM). The IDP for the municipality has identified electricity as a service delivery need and prioritises the need to provide universal access to this service. The CTTM will focus on providing basic services to areas that do not have basic services. The CTTM has identified insufficient provision and maintenance of electricity as a priority concern (CTTM IDP 5 years plan 2011-2016). In line with the National outcomes set for the implementation of the IDP, the proposed project will assist in speeding up the growth and transformation of the economy to create decent work and sustainable livelihoods. The proposed development is aligned to the IDP and supports the municipal objectives and priorities for service delivery and infrastructural development in the area.

(d) Approved Structure Plan of the Municipality	YES X	NO	Please explain
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The proposed development falls within the category of service infrastructure and as such will have no bearing on the municipality's Structure Plans.

The Environmental Management Framework (EMF) aims to ensure that environmental limits to development are included in spatial planning documents. The need for spatial environmental information is critical both as a guide to areas that should be protected from excessive development, as well as to highlight to other planning disciplines the opportunities those environmental resources present to enhancing development. Further to this, the EMF aims to guide protection and enhancement of environmental assets as an integrated process with development patterns throughout the Gauteng Province.

The proposed project is in line with the desired outcomes and objectives of the Environmental Management Framework adopted by the Department and will not compromise the integrity of the existing environmental management priorities for the area. Appropriate and effective mitigation measures, aligned to the desired outcomes, will be incorporated into the EMPr and adhered to throughout the various development phases of the proposed project. It should be noted that the pylon structures will have a minimal impact on the vegetation and all impacts have been rated as low to medium negative by the ecological specialist given that the mitigation measures are implemented effectively.

(f) Any other Plans (e.g. Guide Plan)	YES	NO X	Please explain
No other plans applicable			

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 X	NO	Please explain

The Current land use for the affected area mostly consists of Agriculture. Apart from farming, various projects and programmes have been identified within the credible IDP of Gauteng to initiate skills development, economic development, and increase social economic growth, create much needed job opportunities and promote tourism development throughout the district.

Based on the information outlined above, it is clear that the proposed project is aligned to the desired outcomes and objectives of the projects and programmes identified within the IDP specific to the area affected by the proposed 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 X	NO	Please explain
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Electricity provision in South Africa is a critical issue and it is impossible to create an economically sound country without a secure and reliable electricity source. As previously mentioned, the proposed development forms part of the country's strategies to meet future electricity consumption requirements.

Given that the provision and maintenance of electricity supply has been highlighted as key areas of concern in the Municipality's IDP, increasing the capacity of the electrical infrastructure throughout the study area will provide a stable and reliable supply of electricity which will encourage development in areas which have previously been limited. In addition to this, the proposed development could also improve the livelihoods of local communities by assisting the Local Government in providing electricity to them. Local employment opportunities will also be created during the construction phase of the proposed development.

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 X	NO	Please explain

No additional services will be required to cater for the new electricity infrastructure. Water will be sourced commercially and locally from the municipality; however large volumes will not be required. During the construction phase, water will only be used for concrete batching activities and portable water will be required for drinking and cleaning activities. The municipality has been provided an opportunity to comment on this BAR. Proof of this communication (request for comments from the Municipality) will be included in **Appendix E4** of the Final BAR to be submitted to the competent authority (DEA) for decision making.

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 X	NO	Please explain		
Provision and maintenance of electricity supply has been highlighted as a key area of concern in municipal IDP. The development will contribute to the service infrastructure of the municipality and is therefore mandated to prioritise the upgrade of the electricity supply network. The relevant municipality has been provided an opportunity to comment on this BAR and proof of this communication will be included in Appendix E4 of the Final BAR for submission to the competent authority for decision making.					
7. Is this project part of a national programme to address an issue of national concern or importance?	YES X	NO	Please explain		
The project forms part of the national programme to address the n growth within the local communities of the Gauteng Province.	eed for s	ocial a	and economic		
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 X	NO	Please explain		
It should be noted that the powerline extends parallel to existing power various sections of the alignment. The development will also confirm and pattern of elements that make up the landscape form. Thus the proposed development is within context for a section of the highly incongruous within this setting.	lines with to the typ powerlir	nin the vical vis	study area for sual character would not be		
9. Is the development the best practicable environmental option for this land/site?	YES X	NO	Please explain		
The proposed powerline crosses mostly farmland with minimal environmental impact. The regional importance of the development in terms of the improved reliability of electricity supply, economic and social growth in the surrounding communities, outweighs the potential loss of a minor amount of natural vegetation.					
10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?	YES X	NO	Please explain		
Most of the negative impacts associated with the proposed development are of <u>low significance</u> following mitigation measures. Improved reliability of electricity supply and the increase of supply to the surrounding areas will result in both social and economic growth which is considered to be of high significance. The development will also create temporary employment opportunities during the construction and possibly the operational phases which is considered to be of a <u>High positive</u> significance.					

11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?	YES	NO X	Please explain		
The construction of the electricity grid is not driven by profit gains but to ensure service delivery to the surrounding area and communities. This will inherently have a positive impact on the surrounding communities and region in terms of social and economic growth as well as economic stability. Infrastructure for service delivery will not set a precedent for similar activities in the area at large. However, should additional powerlines be required in the area in future it may be beneficial to align them parallel to one another in order to consolidate the impacts and lessen the severity thereof.					
12. Will any person's rights be negatively affected by the proposed activity/ies?	YES	NO X	Please explain		
Potentially affected landowners (both directly and adjacently affected) have been notified timeously (please refer to Appendix E2) with regards to the proposed development and provided an opportunity to comment. A public meeting is also planned to be held during the public review period of the Draft BAR during which time any concerns with regards to the proposed development can be voiced and discussed by all Interested and Affected Parties (I&APs). The proposed powerline will ultimately be owned by Eskom during the operation and maintenance phases thereof. Therefore, the proposed servitude and powerlines are being assessed on behalf of Eskom and all Eskom procedures will be implemented and adhered to with regards to landowner negotiations, land acquisition and access.					
13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?	YES	NO X	Please explain		
Urban edge is essentially a strategy to counter urban sprawl, encourage densification and protect natural resources. To promote integration of the social, economic, institutional and physical aspects of land development is one of the strategies that the urban edge for the CTMM in Gauteng sets out to accomplish. The proposed construction of the 132kV overhead powerline will be in line with this strategy and is therefore not seen as compromising the urban-edges of the municipality.					
14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?	YES X	NO	Please explain		
SIP 10. Electricity transmission and distribution to all.					

15. What will the benefits be to society in general and to the local communities?	Please explain			
The potential benefit of the proposed powerline and associated infrastructure to the Gauteng Province is centred on the stimulation of the local economy through the additional employment opportunities created and supplied by the powerline construction and maintenance thereof. Some of the surrounding households are still reliant on domestic fires, which in turn negatively impacts on the environment in terms of air quality as well as through the uncontrolled harvesting of woodlands. On a local and regional scale, economies will also be stimulated in the form of additional employment opportunities which will act as a catalyst promoting economic growth in the area. The proposed development will align with Eskom's long term planning for the area and will provide a platform for future electrification of the surrounding households.				
16. Any other need and desirability considerations related to the proposed activity?	Please explain			
As outlined previously, the proposed development is needed in order to improve the reliability of the electricity supply throughout the area and to support the various electricity improvement initiatives within the CTMM. The project will promote economic growth throughout the area and furthermore decrease the number of residents within Gauteng who are still reliant on domestic fires. The use of domestic fires for household use impacts negatively on the environment in terms of air quality as				

The proposed project will therefore assist in speeding up the growth and transformation of the economy to create work, sustainable livelihoods and a stable economy.

17 How does	the project f	it into the	National	Development	Plan for 2030?
17.1100 0003	the project i	it into the	National	Development	

well as through the uncontrolled harvesting of woodlands.

Please explain

The National Development Plan (NDP) for 2030 has a vision that by 2030 South Africa will have an energy sector that promotes economic growth and development through adequate investments in energy infrastructure and the provision of quality energy services (National Development Plan, 2011). It furthermore emphasises the need to create 11 million more employment opportunities.

Based on the abovementioned statement and requirements associated with achieving this goal, the proposed development is aligned with the NDP in that it will assist with the promotion of economic growth by means of producing electricity, strengthening the local electrical feed supply and additional employment opportunities.

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

The proposed development has been adequately considered by the Environmental Assessment Practitioner (EAP) and identified specialists, and all potential impacts that may have a significant impact on the receiving environment have been considered and mitigated to acceptable levels as required by the NEMA 2010 EIA regulations. The findings of the specialist reports have been integrated into this assessment thus giving effect to holistic environmental management.

The conclusions of the environmental impact assessment have been concisely summarised to adequately inform decision-making by the competent authority. A comprehensive Public Participation Process will be undertaken, which will conform to requirements in Chapter 6 of the Environmental Impact Assessment Regulations. Furthermore, all Interested and Affected Parties will be given an opportunity to review and comment on all documents and reports related to this project.

19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.

The primary objective of the project is to provide a stable electricity supply to the municipality and surrounding areas. Provision of a stable electricity supply with spare capacity will encourage future development in the area and will potentially improve the economic situation through additional employment opportunities.

The social, economic and environmental impacts have been identified and rated by the EAP with the assistance of numerous specialists. The Basic Assessment Process was advertised and members of the public will be given the opportunity to register as an Interested and Affected Party (I&AP) as described in Section C: Public Participation and a comment and response report (CRR) will be attached to the Final BAR (**Appendix E**).

Most of the negative impacts associated with the project will occur during the construction phase. Where negative impacts are unavoidable, they will be mitigated accordingly as stipulated in the EMPr. Recommendations and mitigations presented in the EMPr will reduce the disturbance to ecosystems and the loss of biodiversity. Where negative impacts are unavoidable, strict management and rehabilitation is recommended to minimise these potential impacts. The use of potentially polluting substances will be managed according to requirements stipulated in the EMPr. The Developer is bound to the stipulations of the EMPr and will be held accountable should the EMPr not be implemented as stated.

The impacts of the proposed powerline on wetlands will be reduced by micrositing of pylons to avoid placing them within wetland areas or their buffer zones (unless agreed upon). The workers will be given environmental health and safety training prior to commencing any work. Daily 'tool box talks' will be used to inform workers of any specific environmental issues or health and safety concerns relating to the activities or location. The cost of rehabilitation required due to pollution or unnecessary environment degradation resulting from the activity will be the responsibility of the developer.

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	The constitution paved the way for the protection of the natural environment and heritage resources through the recognition of the rights to a safe and healthy environment.	South African Government	
National Environmental Management Act, 1998 (Act No. 107 of 1998)	NEMA is the key environmental management legislation and states in section 2(4)(k) that "the environment is held in public trust for the people, the beneficial use of resources must serve the public interest and the environment must be protected as the people's common heritage" thereby paving the way for EIA process to assess developments that may have a harmful impact on the environment	DEA	1998
Environmental Impact Assessment (EIA) Regulations, 2010 (Government Notice No. R543, R544 and R546, 18 June 2010)	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.	DEA	2010
National Heritage Resources Act, 1999 (Act No. 25 of 1999)	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	1999
National Water Act, 1998 (Act No. 36 of 1998)	This Act provides for the protection and management of water resources. A Water Use License 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. A WUL Application will be submitted as the need for construction of a powerline over a	DWA	1998

	watercourse has been identified, and the construction of tower structures within 500m of a wetland may occur.		
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	In terms of section 6 of the Act, the Minister may prescribe control measures with which all land users have to comply. The control measure may relate to the regulating of the flow pattern of run-off water, the control of weeds and invader plants, and the restoration or reclamation of eroded land or land which is otherwise disturbed or denuded. This act will regulate construction activities to prevent the spreading of invasive species and to ensure successful rehabilitation of the receiving environment.	DEA	1983
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The Biodiversity Act provides for the management and protection of the country's biodiversity within the framework established by NEMA. It provides for the protection of species and ecosystems in need of protection, sustainable use of indigenous biological resources, and equity in bio- prospecting. Some Critical Biodiversity Areas and vulnerable and endangered ecosystems have been identified by the vegetation specialist in the study site.	DEA	2004
National Forests Act, 1998 (Act No. 84 of 1998)	The proposed project may result in the disturbance or damage to a tree protected under the NFA.	Department of Agriculture, Forestry and Fisheries (DAFF)	1983
National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)	The Protected Areas Act provides for the protection and conservation of ecologically viable areas representative of the country's biological diversity, its natural landscapes and seascapes. The proposed routes both preferred and alternative routes runs through a non- statutory protected area.	DEA	2003
Electricity Regulations Act, 2006 (Act No. 4 of 2006)	This act establishes a nationally regulatory framework for the electricity	NERSA	2006

	supply industry, and provides		
	for licenses and registrations		
	generation, transmission,		
	distribution, reticulation,		
	trading and the import and		
	export of electricity are		
	regulated. The erection of new		
	electricity distribution		
	in terms of this act		
National Energy Act 2008	The Act allows for the	South African National	2008
(Act No. 34 of 2008)	regulation, construction and	Energy Development	2000
· · · · · · · · · · · · · · · · · · ·	maintenance of security of	Institute.	
	energy supply in South Africa.		
	The act empowers the energy		
	regulator to invest in the		
	construction and maintenance		
	or energy intrastructure, which		
	electrical infrastructure in		
	areas where the grids are		
	operating at near maximum		
	capacity as well as where		
	electricity is needed for the		
	successful operation of		
	various economically		
National Road Traffic Act	All the requirements stipulated	South African National	1996
1996 (Act No. 93 of 1996)	in the NRTA regarding traffic	Roads Agency Limited	1000
	matters will need to be	(SANRAL)	
	complied with during the		
	construction, operation and		
	decommissioning phases of		
City of Tabutana Matropolitan	the proposed powerline.	City of Tobucono	2011
Municipality	install upgrade and increase	City of Isnwane	2011-
Development Plan (IDP)	the electricity grid in the local	Municipality	2010
	municipality, thus supports the	Wanopanty	
	proposed installation of		
	distribution line.		
Gauteng EMF	The Gauteng EMF is a	Gauteng Province	2014
	decision making tool that		
	should be used to facilitate the		
	for environmental		
	authorisation in order to		
	protect the natural resources		
	within the district.		
Gauteng Biodiversity	This Conservation plan	GDARD	2011
Conservation Plan	provides the boundaries and		
	areas where critical		
	important support areas have		
	been identified and accepted		
	by the provincial authority.		
	The location of the CBAs in		
	the CTMM have been taken		
	acknowledged and mitigation		

	on these CBAs have been proposed by the competent vegetation specialist		
Gauteng Spatial Development Framework	This GSDF was used to determine whether the proposed development is aligned to the outcomes and goals set in the Provincial Spatial Development Framework drawn up for the Gauteng.	Office of the Premier of the Gauteng	2012
Municipal by-laws	All municipal by-laws applicable to the study area will need to be complied with during the construction, operation and decommissioning phases of the proposed powerline development	City of Tshwane Metropolitan Municipality	Varies

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

If YES, what estimated quantity will be produced per month?

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

All solid waste which is not reusable will be collected at a central location and will be stored temporarily until removed to a recognised landfill site. Waste will under no circumstances be allowed to be burned or buried on site. Please note that due to the nature of the project the amount of construction waste that will be generated will be minimal.

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

An approved registered municipal landfill site.

Will the activity produce solid waste during its operational phase?

If YES, what estimated quantity will be produced per month?

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

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

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?

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?

VEC	NO
TES	Х

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.

b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

If YES, what estimated quantity will be produced per month?

Will the activity produce any effluent that will be treated and/or disposed of on site?

1	YES X	NO
	Minima	

YES X

YES X m³ 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 facility?	produce effluent that will be treated and/or disposed of at another	YES	NO X
If YES, provide t	he particulars of the facility:		
Facility			
name:			
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:

N/A

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other that exhaust emissionsYESNOand dust associated with construction phase activities?X

If YES, is it controlled by any legislation of any sphere of government?

IES	X
YES	NO
	х

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:

During the construction phase, it is expected that there will be short-term dust generation and emissions from vehicles and machinery. However, the dust and emissions will have a medium- to short-term duration and have a limited impact on the very immediate surrounding rural areas. Where appropriate, dust suppression measures will be implemented to reduce the impacts. It is recommended that construction vehicles be serviced and kept in good mechanical condition to minimise possible exhaust emission.

d) Waste permit

Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM:WA?



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?

If YES, is it controlled by any legislation of any sphere of government?

YES	NO
Х	
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:

<u>Noise control regulations and SANS 10103</u>: Short term noise impacts are anticipated during the construction phase of the project. It is however anticipated that the noise will be localised and contained within the construction site. The applicant must adhere to the relevant provincial noise control legislation (if any) as well as SANS 10103. Working hours should be restricted to 07h00 to 18h00 Monday to Friday excluding public holidays unless otherwise agreed with adjacent landowners.

13. WATER USE

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

|--|

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: Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?

Iitres YES X NO

This powerline crosses drainage lines and watercourse features along various sections of the proposed alignment. The main impact of the powerline is due to construction of the pylon structures (which has a very small local footprint). The pylon structures will be positioned to avoid the actual drainage lines and watercourses, where applicable, but may occur within the buffer area of the watercourses.

A water use license application (WULA) will be applied for from the Department of Water Affairs in a separate process. Please note that Section 21 (c) and (i) activities likely to be triggered

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

14. ENERGY EFFICIENCY

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

N/A

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

N/A

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

Property

description/physi cal address:

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	
X	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**.

Alternative 1 & Alternative 2 (Preferred alternative):

Province	Gauteng Province
District	City of Tshwane Metropolitan Municipality
Municipality	
Local Municipality	City of Tshwane Metropolitan Municipality
Ward Number(s)	Ward 100
Farm name and	Refer to Appendix E for farm details
number	
Portion number	Refer to Appendix E for farm details
SG Code	Refer to Appendix E for SG codes.

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.

List attached in Appendix E

Current land zoning as local municip IDP/records:	l-use per pality	Agriculture
	_	

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.

Alternative S1:

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

Alternative S2 (Preferred alternative):

Flat	1.50 - 1.20	1.20 - 1.15	1.15 - 1.10	1.10 1.75	1.7.5 1.5	Stooper
Παι	1.30 - 1.20	1.20 - 1.13	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:



3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

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

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.

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).

Alternative 1:

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

Alternative 2 (Preferred alternative):

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.

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	YES	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.

According to C-Plan data, a river was identified to occur in the study area, where route Alternative 1 intersects this riverine feature along several points along the eastern end of the alignment. It should be noted that even through route Alternative 2 (preferred alternative) occurs within 32m of the identified riverine feature, it does not intersect the river at any point in time. Further to this, a channelled valley bottom wetland was identified along the eastern end of route Alternative 1. The main impact of the powerline is related to construction of the tower structures, each of which occupies only a very small local footprint. The tower structures will be positioned to avoid watercourse features, where applicable.

The river identified in the immediate vicinity of the powerline routes is non-perennial and the wetland has been identified as being permanent due to its inundation and saturation periods. The proposed powerline falls within the Eastern Brakenveld and Highveld Aquatic Ecoregion and is located within A23A quaternary catchment. The Present Ecological State (PES) for A23A is indicated to be category B (largely natural) and Category C (moderately modified), depending on feature assessed.



Figure 5: Representative images of the channelled valley bottom wetland identified along the Diamond-Bynes alignment alternatives

A detailed study on the wetlands and drainage lines were undertaken by a wetland specialist (Mr Steven van Staden from Scientific Aquatic Services) and the full report is attached in **Appendix D**.

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	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	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 [™]	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?

The proposed powerline will cross the Dinokeng railway line, but there will be no impact on the railway line. All height restrictions will be adhered to.

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
Core area of a protected area?	YES	NO
Buffer area of a protected area?	YES	NO
Planned expansion area of an existing protected area?	YES	NO
Existing offset area associated with a previous Environmental Authorisation?	YES	NO
Buffer area of the SKA?	YES	NO

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
Uncertair	1

The only heritage resource of any significance is the natural spring where adherents of separatist Churches (ZCC; Apostolic Faith, etc.) collect water to be blessed by their respective priests. The blessed water is then used during cleansing ceremonies. The act of collecting water for this purpose is referred to as *Itaelo*. Due to the natural spring's high local significance, the heritage site has been allocated a grading of 3 (heritage resources worthy of conservation on a local authority level). It should however be noted that it is not anticipated that any impacts be experienced on this heritage site given that the proposed powerline will extend north of the N4, whereas the spring is located south of the N4.

Please refer to **Figure 6** below for the natural spring and active collection of water, alternatively known as *Itaelo*.



Figure 6: Natural spring and active collection of water - Itaelo

A detailed study on the Heritage resources of the affected area was undertaken by a Heritage specialist (Dr Johnny van Schalkwyk) and the full report is attached in Appendix D.

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:

GIBB appointed Johnny van Schalkwyk Consulting to assess the potential impacts to heritage resources that may occur throughout the construction of a proposed distribution powerline and associated substation in the Boschkop area (Gauteng Province), in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended, in compliance with Section 38 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), (NHRA) as amended.

Johnny van Schalkwyk Consulting identified that Archaeological resources were not widespread throughout the area, however a natural spring constituting a high local significance was identified. Due to the nature of the project and the fact that the powerline will not physically intersect the natural spring, it is not envisaged that the proposed development will have a significant impact on this heritage site itself. Therefore, the overall heritage significance of this site has been rated as <u>very-low</u>.

It has been concluded from the assessment that the proposed powerline and associated substation development may proceed along either one of the alternatives, given that the required mitigation measures or recommendations are effectively implemented.

Should any palaeontological material, archaeological material or human burials be uncovered during the course of the development, work should be stopped immediately and the findings needs to be reported to the relevant heritage authorities.

Based on the information provided above, Johnny van Schalkwyk Consulting, recommends that the development proceed with the effective implementation of the proposed heritage mitigation measures and have submitted the full HIA report to SAHRA in fulfilment of the requirements of the NHRA. Mitigation measures recommended by Johnny van Schalkwyk Consulting have been incorporated into the EMPr and should be implemented. Please refer to Appendix D for the complete HIA.

Will any building or structure older than 60 years be affected in any way?

VEQ	NO
IES	Х
VEC	NO
IES	Х

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

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

Please refer to Annexure D for the full Heritage Impact Assessment specialist report.

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:

City of Tshwane Metropolitan Municipality:

Even though the CTMM boasts a vibrant, diverse and growing economy which contributed 27% to Gauteng's Gross Domestic Profit (GDP) and 9% to the national GDP in 2011, employment opportunities are still an area of concern in the municipality. The total population size of this municipality is 2,921,488 and the unemployment rate is estimated at 24.2%. Amongst the working age group (15–64 years) in the area, constituting of 71.9% of the total population, it is estimated that 32.6% are unemployed. Only 23.4% of the population aged 20+ partook in higher education enrolment.

The unemployment concern is also further highlighted by the annual household income profile of the municipality. According to the Census 2011 data, nearly 15% of households have no source of income and approximately 46% of households in the municipality earn an annual income of less than R76,401.00. Individual monthly incomes vary greatly amongst population groups and over 44 per cent of individuals in the City have no source of income whilst another 9,6 per cent of the population earns less than R401 per month and almost 21 per cent of the population earns between R401 and R1 600 per month. **Figure 7** below represents the average percentage and household income of the CTMM.



Figure 7: Average employment percentage and household income

Of the 991,536 households within the CTMM, 88.6% have electricity for lighting; 76.6% has a flush toilet that is connected to sewerage systems; and 80.7% have weekly refuse removal. **Figure 8** below represents the ethnic makeup of the overall population in CTMM. According to this information, the most dominant ethnic group residing within this area, contributing 75.4% of the overall population size, is the Black African ethnic group. The remaining 24.6% of the population is spread across the remaining ethnic groups identified as Coloured (2%), Indian/ Asian (1.8%), White (20.1%) and other.



Economic profile of local municipality:

The lack of energy resources within rural areas of South Africa is recognised as a major factor retarding socio-economic development.

City of Tshwane Metropolitan Municipality:

The total population size of the municipality is 2,921,488, and the key economic sectors are community services and government, followed by finance and manufacturing. Metal products, machinery and household products are the largest sub-sectors within manufacturing. The municipality further has a well-established manufacturing sector, with the automotive industry representing the most significant component.

Level of education:



In 2011, an approximate 3.1% of the total population residing in the CTMM had no form of schooling. Coupled with those individuals who only completed some form of primary education (a further 33.3%). As such approximately half of the population had limited educational skills, which in turn would hinder their employability on the general employment market. It is statistically proven that only an estimated 6.1% of the population obtained a higher education.

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?	R80 Millic	n
What is the expected yearly income that will be generated by or as a result of the activity?	Unknown	
Will the activity contribute to service infrastructure?	YES X	NO
Is the activity a public amenity?	YES	NO X
The proposed 132kV powerline and associated substation will serve upgrading and strengthening the existing electrical feed supply in the area	ve its pur ea.	pose in
	Eskom	
How many new employment opportunities will be created in the development and construction phase of the activity/ies?	undertake open t process te suitable contractor carry c	es an eendering o employ rs to out the
	constructi phase	on of the
	developm Contracto required employ unskilled labourers	for non-
What is the expected value of the employment opportunities during the development and construction phase?	This can established the contra	only be ed once ractor is
What percentage of this will accrue to previously disadvantaged individuals? How many permanent new employment opportunities will be created during the operational phase of the activity?	>/= 90 % None. Es maintain powerline constructe	kom will the once ed
What is the expected current value of the employment opportunities during the first 10 years?	N/A	
What percentage of this will accrue to previously disadvantaged individuals?	N/A	

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	Ecological Support	Other Natural	No Natural Area	Endangered vegetation types from the NCBCP and the WCBCP
Area (CBA)	Area (ESA)	Area (ONA)	Remaining (NNR)	Vulnerable vegetation types from the STEP and NCBCP and WCBCP

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).		
		The natural habitat units predominantly found throughout the study area includes the Acacia karroo – Acacia caffra Mixed Woodland, Acacia caffra – Combretum molle closed woodland, Englerophytum magalismontanum (stamvrug) rocky grassland and the Searsia lancea – Combretum erythrophyllum riparian/wetland vegetation.		
Natural 60%		The Acacia karroo woodland vegetation unit is considered to be moderately sensitive due to its moderate species richness. The Acacia caffra is considered to be highly sensitive due to the tree species high species richness. The Englerophytum magalismontanum grassland is known to support a few Red listed plants and is known for its high species richness.		
		Even though the vegetation units found throughout the study area constitutes a moderate to high sensitivity and support a vast array of species, alteration in the natural state of these vegetation units were noted. This is due to overgrazing and invasion of alien invasive plant species.		
Near Natural (includes areas with low to moderate level of alien invasive plants)	35%	Disturbances on the habitat conditions found throughout the study area are caused by farming activities, cattle grazing activities as well as the introduction of Bluegum plantations.		
Degraded (includes areas heavily invaded by alien plants)	0%	No areas exist which is heavily degraded and/ or invaded by alien plant species.		
Transformed (includes cultivation, dams, urban, plantation, roads, etc)	5%	Throughout the study area, roads and existing powerlines are prominent along the proposed powerline route, where the vegetation has been transformed due to this infrastructure. This transformation of natural vegetation however does not comprise a significant proportion of the study area and further emphasises the need for the proposed alignment to be located parallel to the existing N4 alignment in the area.		

Please refer to Figure 10 below for the affected reaches of the CBA and ESA areas.

BASIC ASSESSMENT REPORT



Figure 10: Affected CBA area relevant to the proposed development

C) Complete the table to indicate:

- the type of vegetation, including its ecosystem status, present on the site; and
- (i) (ii) whether an aquatic ecosystem is present on site.

Terrestrial Ecosystems	6	Aquat	ic Ecos	ystems				
Face water threat	Critical	Wetland (including rivers, depressions, channelled and unchanneled wetlands, flats, seeps pans, and		Ectuary		Coastline		
status as per the	Endangered							
National	Vulnerable			Coastinie				
Management:	Lagat	artificia	wetland	ls)				
Biodiversity Act (Act	Threatened	YES NO LINSLIDE VES		NO	VES	NO		
		X	NU	UNSUKE	IES	Х	IES	х

The proposed development extends over two terrestrial ecosystems namely the Gold Reef Mountain Bushveld in the east and the Marikana Thornveld in the west of the study area. The Gold Reef Mountain Bushveld ecosystem constitutes a least threatened status whereas the Marikana Thornveld ecosystem constitutes an endangered conservation status.

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)

Vegetation:

The vegetation types that will be affected by the proposed development are the Gold Reef Mountain Bushveld in the east and the Marikana Thornveld in the west of the study area. These vegetation units constitute a *least threatened* and *endangered* conservation status and and is made up by the following habitat units:

- Acacia karroo Acacia caffra Mixed Woodland;
- Disturbed Acacia karroo Mixed woodland;
- Acacia caffra Combretum molle closed woodland;
- Englerophytum magalismontanum (stamvrug) rocky grassland;
- Searsia lancea Combretum erythrophyllum riparian/wetland vegetation; and
- Altered vegetation

Acacia karroo - Acacia caffra Mixed Woodland

The dominant species that were visible throughout this vegetation unit were *Acacia karroo* and *Acacia caffra* with *Themeda triandra*, *Brachiaria serrata* and *Cymbopogon excavatus* grasses visible in the herbaceous layer. The herbaceous layer of this vegetation is often poorly developed and prone to disturbance such as trampling, litter and dumping in this specific area. Exotic invasive species are also often found on ground level.

From a habitat sensitivity point of view, this habitat unit is considered to constitute a <u>moderate</u> <u>sensitivity</u> due to its moderate species richness and habitat value for a wide variety of faunal species.

Disturbed Acacia karroo Mixed woodland

Several areas along the proposed route alternatives were characterized by Acacia karroo woodland that has been disturbed. Due to this disturbance, this woodland habitat supports a lower species richness than what is observed in undisturbed woodland areas. The form of disturbance found throughout this woodland area, is the occurrence of exotic invasive vegetation as well as sections where only homogenous vegetation is found as opposed to a diversity of vegetation types. Due to the disturbance that has occurred, this habitat unit is considered to constitute a <u>low sensitivity</u>.

Acacia caffra - Combretum molle closed woodland

The dominant species that were visible throughout this vegetation unit were *Acacia caffra*, *Combretum molle* and *Canthium gilfillanii*. This habitat unit is known for its density and was commonly found at the foothills of the Magaliesberg ridges, on both sides of the N4. The woody species associated with this habitat unit are diverse, however constituted a poorly developed and often disturbed herbaceous layer. Various disturbances to this habitat was noted throughout the area, where the majority of disturbances are related to human activities (trampling, littering and dumping) commonly found towards the outskirts of the Tshwane metropolis.

This habitat unit is considered to constitute a <u>moderate sensitivity</u>, even though disturbances were noted. This is due to the high species richness in the trees and unique range of species that were found throughout the area.

Englerophytum magalismontanum (stamvrug) rocky grassland

The dominant species that were visible throughout this vegetation unit were *Englerophytum magalismontanum* (*staumvrug*), the shrub *Lopholaena coriifolia* and *trees Ochna pulchra* and *Burkea africana*. This habitat unit is known for its rocky grassland found on the rocky higher slopes of the Magaliesberg ridge. Due to its locality (higher slopes of the ridge), very few disturbances were noted throughout the area. Further to this, rocky grassland specifically found on the Magaliesberg ridge, is known to support various Red listed plant species. The quartzite ridges in Gauteng are also very well known for their high species richness. As such, this habitat unit is considered to constitute a <u>high sensitivity</u>.

Searsia lancea - Combretum erythrophyllum riparian/wetland vegetation

The dominant species that were visible throughout this vegetation unit specifically in close proximity to larger streams, were trees such as *Combretum erythrophyllum* (river bushwillow) and *Searsia lancea* (Common Karee). Riparian vegetation along the edges of the river identified along the eastern end of route Alternative 2, include plants such as *Typha capensis* (Bullrush) and *Phragmites australis* (Reed). The watercourse features found throughout the study area is known to support several species in terms of habitat and shelter. Even though some disturbances were noted throughout this vegetation unit, it is considered to constitute a <u>high sensitivity</u>.

Please refer to **Figure 11** below for the map indicating the location of the habitat unit in respect to the proposed development.



Topography, geology and soils:

The study area comprises rocky quartzite ridges of the Magaliesberg as well as a valley and slight undurlating plains at the foot of the hill on the southern end of the study area. The rocky hills and ridges extend from the eastern end of the study area to the western end, where dense woody vegetation prominent along the southern end of the study area. Distinct floristic differences are noted along the slopes, which includes the preponderance of *Acacia caffra*. Tree and shrub layers are often continuous and the herbaceous layer throughout the study area is dominated by grasses.

The Marikana Thornveld is typically represented by open Acacia karoo woodland, occurring in valleys and slightly undulating plains and some lowland hills in the western portion of the study area. Shrubs are more dense along drainage lines and specifically found on termitaria and rocky outcrops or in other habitat protected from fire.

The only wetland feature of significance identified is a channelled valley bottom wetland feature encountered along the proposed alignment alternatives. A map indicating the location of the wetland feature is included in **Figure 12** below.



Local Climate:

The climate typically constitutes a summer rainfall climate with very dry winters. Three seasons characterize the climate including a cool dry season from May to Mid-August, a hot dry season from Mid-August to October and a hot wet season from November to April. The study area normally receives about 517mm rain per annum, with most rainfall occurring mainly during the summer months. Temperatures experienced in summer are hot, reaching maximum temperatures of 28°C by day and dropping to a temperature of 14°C at night. Day temperatures in winter reach a maximum of 19°C, however night temperatures can drop to as low as 3°C, with occurrence of occasional frost.

Biodiversity:

It has been identified that the proposed alternatives intercept various areas of environmental sensitivity. Along both the western and eastern end of the proposed powerline, *ecological support areas* (brown area) are found. Further to this, along the middle section of the proposed route, an area constituting an *irreplaceable* (green area) conservation status is found. The vegetation found in these areas are deemed fairly natural, however moderate alterations have occurred as a result of farming practices.

The conservation status according to C-Plan data is outlined in Figure 13 below.



Flora:

Several Red listed species are recorded for the study area where the habitat of these plant species includes rocky grasslands, open and closed woodlands, rocky hillsides, riverine and wetland habitats. The conservation status for these vegetation types are indicated as both *least threatened* and *endangered*. It should however be noted that due to the nature of the proposed development and the span distance of the powerline itself, it is not envisaged that these sensitive plant species will be impacted upon.

Fauna:

Mammals

Species observed during the site visit were limited due to the close proximity to human activity throughout the study area. Data obtained for the study area indicates that several sensitive mammal species potentially occur throughout. A desktop assessment of the study area indicate that the following sensitive species may potentially occur in the study area:

Scientific name	Common name	Status
Atelerix frontalis	South African hedgehog	Near Threatened
Myotis welwitschii	Welwitsch's hairy bat	Near Threatened
Myotis tricolour	Temminck's hairy bat	Near Threatened
Pipistrellus rusticus	Rusty bat	Near Threatened
Miniopterus schreibersii	Schreiber's long-fingered bat	Near Threatened
Rhinolophus clivosus	Geoffroy's horseshoe bat	Near Threatened
Myotis welwitschii	Welwitsch's hairy bat	Near Threatened
Rhinolophus darlingi	Darling's horseshoe bat	Near Threatened
Rhinolophus blasii	Peak-saddle horseshoe bat	Vulnerable
Cloeotis percivalli	Short-eared trident bat	Critically Endangered
Mellivora capensis	Honey badger	Near Threatened

SA Hedgehog - The SA hedgehog has a wide tolerance for various habitats. They are nocturnal and although they can be found in most environments they prefer grass and bushveld that is not too damp, with a good covering of leaves and other debris.

Honey Badger - The ratel tolerates a wide range of conditions. It is an opportunistic insectivore and carnivore, but takes an even wider range of invertebrate and vertebrate prey, from insects to the young of large mammals, and it eats carrion. It also eats berries and fruits. It's digging ability, perhaps second only to the aardvark's, with whose holes its holes are often confused, enables it to extract buried food that is inaccessible to less-accomplished excavators. In addition, the ratel is one of the few mammalian predators on bees, feeding both on larvae and honey, hence the scientific name *Mellivora*, "honey eater," and its common name, honey badger (Wildlife campus 2014).

Bats - A range of bat species can potentially occur in the study area. Sufficient savanna and food sources exist in the study area to support bat populations. Several species are dependent on caves where they rest during the day. They will also use follow trees and crevices in rocks for this purpose. Given the nature of this project, it is deemed unlikely for bats to be disturbed by the construction of a powerline.

Reptiles & Amphibians

The reptile atlas of South Africa indicates that 57 Reptile species occur within the Boschkop area. These species include snakes, skinks, lizards, geckos, terrapins and tortoises. Five 95) endemic species are listed including Distant's Ground Agama (*Agama aculeate*), Transvaal Gecko (*Pachydactylus affinis*), Aurora house snake (*Lamprophis aurora*), Cape grass lizard (*Chamaesaura anguina anguina*) and the Coppery Grass Lizard (*Chamaesaura aenea*). These species have a *Least Concern* conservation status as endemic species. Other species that are worthy to mention are Southern African Python (*Python natalensis*), the Leopard Tortoise (*Stigmochelys pardalis*), two records for the, Nile crocodile (*Crocodylus niloticus*) (Vulnerable) as well as the Striped Harlequin Snake (*Homoroselaps dorsalis*). All of these species have a *Near Threatened* status.

Further to this, amphibians are largely associated with wet areas such as rivers, streams, wetlands and pans. One prominent stream and associated valley bottom wetland area bisect the corridors that were assessed. Most of the amphibian species have a least Concern status, except for the Giant Bullfrog (*Pyxicephalus adspersus*) that is Near Threatened and listed for the area.

The Giant Bullfrog has this status in South Africa because many of its populations have been destroyed or otherwise adversely affected by human activities. Habitat loss, which is the most severe in Gauteng province, is having the greatest impact on the species. Bullfrogs use shallow, still-standing, seasonal water to breed.



Figure 14: Giant Bullfrog constituting a Near Threatened Conservation Status

Ecological Impact Assessment

Please refer to Table 2 below for the Impacts and Mitigation measures identified in the Ecological Impact Assessment:

Table 2: Ecological	Impact Assessment
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Impacts:	Mitigation Measures:
Loss of vegetation and associated faunal species	 Clearing of the servitude should be as narrow as possible; A summer walkthrough should be conducted by a qualified botanist to identify any rare or threatened plant species; Trees in the grassland habitats should be avoided as far as possible; The relevant licenses and permits will need to be obtained for the removal of protected trees, sensitive plants; Sensitive habitats should be avoided as far as is possible; Demarcate the servitude with semi-permanent markers; No painting or marking of rocks or vegetation shall be allowed; No trees or branches should be used for fire making; If herbicides are used for the removal of trees, it should be species specific; Big trees that need to be removed must be cut and treated with pesticide.
Disturbance of eco-system processes	 A Fire Management Plan must be compiled by the Project team. No open fires will be allowed; Rehabilitation efforts should be implemented along steep slopes to prevent erosion; An indigenous grass mix must be used for rehabilitation; Strips of bush must be maintained on steep slopes to limit risk of erosion; Game must be fenced out of areas where rehabilitation efforts are underway; A strategy must be developed to prevent the dispersal of alien plants.
Disturbance of riverine habitat	 No disturbance of riparian vegetation (riverine or wetland) should be allowed; Existing roads must be used around riverine areas; Pylons should be located further than 32m from the edge of riparian zones.
Loss of Red Listed plants	 Should any sensitive species be found, management measures should be adopted for the species and fenced if at all possible; Sensitive plant species should be removed and relocated from points of direct impact before construction commences.
Loss of Red Listed bird species	 Incorporate bird perches onto the pylon structures; Install bird flappers or devices in high risk sections of the powerline.
Loss of common and Red Listed faunal habitat	 No wild animals are allowed to be harmed or hunted; Tortoises and porcupines should be removed to surrounding areas; Relevant work personnel must be briefed and trained on the presence of dangerous species; Vehicle traffic after dark should be limited as far as possible.

A detailed study on the ecological resources in the study area was undertaken by an Ecologist (Mr Mark Custers from ECO Assessments cc) and the full report is available in Appendix D.

From an Ecological point of view, the proposed substation locations have similar impacts on the receiving ecological conditions and as such either one of the site alternatives are preferred. Further to this, it is envisaged that route Alternative 2 will have a smaller impact on the receiving ecological conditions as it completely avoids the channelled valley bottom wetland located in the eastern section of the study area. As such, route Alternative 2 is preferred from an ecological point of view.

Avifauna Assessment:

Of the total avifauna, twelve (12) priority species were recognized as key in the assessment of avian impacts of the proposed Diamond-Bynes 132kV powerline in Boschkop. These are mostly nationally and/or globally threatened species which are known to occur, or could potentially occur, in relatively high numbers throughout the development area and could potentially be negatively affected by the proposed development. These species include the Blue Crane, Cape Vulture, Martial Eagle African Fish-Eagle and African Hawk Eagle. These species were included because they are scarce, impact susceptible, predatory species that potentially play an important role in maintaining ecological balance in the local environment.

Please refer to Table 3 below for the Impacts and Mitigation measures identified in the Avifauna Assessment:

Table 3: Avifaunal	Impact	Assessment
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Major Impacts:	Mitigation Measures:		
Disturbance of raptors, large, terrestrial, wetland and savanna birds	 Ensure that all new lines are marked with bird flight diverters; Ensure that all new powerline infrastructure are adequately insulated and bird-friendly; 		
Habitat loss for raptors, large, terrestrial, wetland and savanna birds	 Minimize disturbance impacts associated with maintenance of the lines by proper scheduling of activities; Minimise the extent of woodland cleared in the servitude required for the route of the alignment; 		
Mortality of raptors, large terrestrial and wetland birds	 Establish practical and sustainable management plan for dealing with raptor stick nests built on the new line. 		

A detailed study on the avifauna species of the study area was undertaken by an Avifauna specialist (Mr Andrew Jenkins from Avisense Consulting) and the full report is attached in Appendix D.

From an Avifaunal point of view, the proposed alternatives have similar impacts and any of those can be implemented provided the stipulated mitigation measures are implemented effectives.

Wetland Assessment:

The proposed project footprint falls within the Eastern Bankenveld and Highveld Aquatic Ecoregion and is located within A23A quaternary catchment reach. One (1) wetland feature, namely a channelled valley bottom wetland is traversed by the proposed alignments. Following the assessment of the channelled valley bottom wetland feature, the wetland was classed as having a *moderately high importance*.

It should be noted that the watercourse features play an important role in biodiversity maintenance as it serves as a migratory corridor for faunal species moving underneath the N4 highway.

The Present Ecological State (PES) of the **channelled valley bottom wetland feature** falls into a Category B/C, which indicates that this area is largely <u>natural/moderately</u> modified.

Please refer to **Figure 15** for representative images of the various watercourse features along the propose Pelly-Fairfield powerline alignment alternatives.



Figure 15: Watercourse features along the proposed Pelly-Fairfield powerline alignments

Please refer to Table 4 below for the Impacts and Mitigation measures identified in the Ecological Impact Assessment:

Table 3: Wetland Impact Assessment

-	
Impacts:	Mitigation Measures:
Impacts on Wetland Habitat and Ecological Structure Changes to Wetland Ecological and Sociocultural Service Provision Impacts on Wetland Hydrological Function and Sediment Balance	 No support structures should be constructed within the wetland and riparian areas; Limit the footprint area of the construction activities. Construction vehicles must use existing roads where possible; During construction all building materials should be kept out of the wetland and riparian areas as well as any active stream channels; All waste and remaining building materials should be removed from site on completion of the project; No vehicles should be allowed to indiscriminately drive through the wetland and riparian areas or within the active stream channels; The wetland profile should be re-instated to prevent incision and erosion; Concurrent rehabilitation is to take place as far as possible; Implement alien vegetation control program; Monitor all disturbed areas for erosion and incision; Continually maintain access roads; Avoid unnecessary site clearing/vegetation clearing.

With the implementation of the relevant mitigation measures proposed by the wetland specialist, it is envisaged that the significance of all impacts on wetland feature can be limited to have a <u>low</u> to <u>very-low significance</u>.

Based on this, it is recommended by the wetland specialist that all watercourse features be managed as a <u>Category B</u>. This is deemed sufficient to enhance and maintain the currently ecology of the feature, provided that the mitigation measures set out in this report are adhered to. Specific emphasis is placed on avoiding unnecessary disturbance to wetland and riparian zones, avoiding placement of pylons in wetland and riparian areas and where such actions are absolutely unavoidable, sufficient rehabilitation measures must be implemented.

Based on the findings from the wetland assessment, route Alternative 1(a) is preferred as it does not extend over the channelled valley bottom wetland. Further to this, either one of the substation site alternatives will be acceptable from a wetland point of view as there are no significant differences between the two and neither one of these will affect any watercourse feature. It is important to note however that the development of the proposed alternatives my only take place provided that the proposed mitigation measures be implemented and adhered to.

Please refer to **Figure 16** for the various watercourse features found throughout the study area, depicting the required buffer zone required to maintain the integrity of these features.



Figure 16: Wetland feature affected by the proposed powerline

A detailed study on the wetlands and drainage lines were undertaken by a wetland specialist (Mr Steven van Staden from Scientific Aquatic Services cc) and the full report is attached in Appendix D).

From a wetland point of view Alternative 2 are preferred as it completely avoids the channelled valley bottom wetland and associated 32m buffer zone located in the eastern section of the study area. As such, route Alternative 2 is preferred from a wetland point of view.

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

Publication	The Streeknuus			
name				
Date	01 April 2015			
published				
Site notice	Description	Latitude	Longitude	
position	Along the R104 at the starting point of the proposed powerline alignment – T-off from the existing Bynes 132kV powerline	25°46'33.73"S	28°29'5.04"E	
	Along the proposed powerline route – R104	25°46'33.86"S	28°28'2.60"E	
	At an intersection along the R104 – Donkerhoek Toll Plaza	25°46'23.02"S	28°27'7.19"E	
	On site – Diamond substation alternative 1	25°46'6.09"S	28°26'31.09"E	
	On site – Diamond substation 2	25°46'8.02"S	28°26'9.36"E	
Date placed	26 March 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 54(2)(e) and 54(7) of GN R.543.

Key stakeholders (other than organs of state) identified in terms of Regulation 54(2) (b) of GN R.543:

SURNAME	FIRST NAME	ORGANISATION / COMPANY	TEL
Malan	Dawie	DGRMA	083 251 4614
Venter	Piet	DGR	011 085 2513 082 894 9473
Prins	Stephan	DGR	011 085 2513 072 693 7780
Engelbrecht	Nadia	VFV Attorneys	012 460 8704
==	==	Mag Truck Spares Pty Ltd	No conact details available
Malan	Kerstin	Private Person	012 802 0186
Von Welfling Eybers	George	Private Person	012 327 0630 072 640 8951
Wixley	Craig	Private Person	012 802 1313 082 419 4004
		RRR & S Prop Pty Ltd	No conact details available
Choi	Young	Private Person	No conact details available
		Hoewe 44 Familiestrust	No conact details available
		Sme Business Development Corp	No conact details available

Malan	Kerstin	Private Person	012 802 0186	
		Maran Trust	No conact details available	
		Brikor Ltd	No conact details available	
Von Welfling Eybers	George	Private Person	012 327 0630 072 640 8951	
		Theses Island Prop Holdings Pty Ltd	No conact details available	
Van Zyl	Carol	Private Person	012 736 2031	
		Francois Van Zyl Trust	No conact details available	
Retief	Janetta	Private Person	082 652 0626	
		Magnum Archery Bowhunting Academy Cc	No conact details available	
Du Plessis Prinsloo	Martha	Private Person	No conact details available	
Mostert	Hermanus	Private Person	012 663 7363	
Minnaar	Louis	Private Person	012 802 1398 083 309 8357	
		Donkerhoek Besigheidstrust	No conact details available	
Prinsloo	Gerhardt	Private Person	012 348 3790 082 804 8673	
		Mbokoto Conference Training & Guest Lodge Cc	012 802 0883	
Du Toit	Joan	Cullinan Conservancy	012 736 2069 082 681 5122	
Nizami	Nbaidul	Private Person	083 464 0165	
Nyathi	Sylivia	Private Person	061 212 6394	
Sithoze	Joshua	Private Person	061 212 6394	
Ngube	Lidia	Private Person	074 335 5547	
Mokhusela	Moris	Private Person	074 335 5547	
Jooste	Jooste	Private Person	012 802 0009	
Rohmann	Kallie	Private Person	076 272 4229	
Baloyi	Jim	Private Person	072 488 6089	
Prinsloo	Suney	Private Person	012 802 1515	
Powell	S.	Private Person	012 492 0112	
Nolte	Marius	Nbs Café	082 944 9279	
Mattinzu	George	Private Person		
Marais	Mariuze	Private Person	012 736 2086	
Ferreira	Jennifer	Private Person	079 9315 839	
Holen	Mandy	Private Person	071 378 1943	
Naz	Ismail	Private Person	084 5942966	
	Hellen	Private Person		
	Magda	Monica Video Den	082 833 6632	
		Rayton Pharmacy	012 734 4800	
		Rayton Bictony	072 567 1435	
Hoffman	C.	Private Person	082 054 6137	
Kruger	Υ.	Private Person	082 540 6810	

Hoffman	S.	Private Person	012 734 5007
Steyn	D.	Private Person	012 734 4091
Kekana	F.	Private Person	071 578 6657
De Andrude	M.	Private Person	012 734 4868/9
Mahmood	Ali	Private Person	074 908 2222
Walla	Azmat	Private Person	074 415 8998
Kuthwang	Jerry	Private Person	079 871 6676
Mahlatse	Christopher	Ward 100	083 744 9139

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

Summary of main issues raised by I&APs	Summary of response from EAP
The public review of the Draft BAR will take place	e from 07 April 2015 to 18 May 2015 for a period
of the last All second states and the little second states	

The public review of the Draft BAR will take place from **07 April 2015 to 18 May 2015** for a period of 40 days. All comments received will form part of a comment and response report (CRR) that will be submitted to the authority for decision making.

4. 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**.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

AUTHORITY/OR GAN OF STATE	CONTACT PERSON (TITLE, NAME AND SURNAME)	TEL NO	E-MAIL	ADDRESS
Gauteng Department of Agriculture and Rural Development (GDARD)	Justine Chan	011 240 2500	Justine.Chan @gauteng.gov .za	11 Diagonal Street, Diamond Building, Newtown, Johannesburg, 2000
Provincial Heritage Resources Authority Gauteng (PHRAG)	Maphata Ramphele	011 355 2572	maphata.ramp hele@gauteng .gov.za	Surrey House, Cnr. Fox & Rissik Street, Johannesburg
Department of Water Affairs (DWA)	Lillian Siwelane	012 392 1454	siwelanel@dw a.gov.za	185 Francis Baard Street, Pretoria 0001
City of Tshwane Metropolitan Municipality	Rudzani Mukheli	012 358 8731	RudzaniM@T SHWANE.GO V.ZA	Isivuno Building, Cnr. Madiba & Lilian Ngoyi Street, Pretoria
Ward 100 Councillor	Christopher Mahlatse	083 744 9139		1270 Ext 1 Masina Street, Refilwe, Cullinan, 1000

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

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

6. 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**

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.

Activity	Impact summary	Significance	Proposed mitigation		
Alternative 1 (prefer	Alternative 1 (preferred)				
Construction Phase					
Increased soil erosion due to the removal of vegetation along servitude route	<i>Direct Impact</i> Soil erosion and degradation	Very Low	 Undertake vegetation clearing during the dry season; Only clear vegetation where absolutely necessary; and Stockpile areas will be decided and approved by the Project Manager and appointed ECO before construction commences on site and should not be located within drainage lines. 		
Surface water contamination and degradation due to oil and fuel leaks from construction vehicles	Direct Impact Surface water contamination and degradation	Very Low	 All construction vehicles should be kept in good working condition; All construction vehicles should be parked in demarcated areas when not in use, and the soil in this area should be rehabilitated (if required); Drip trays should be placed under construction vehicles when not in use; to collect any spillages/leaks if necessary; Construction activities associated with the establishment access roads through wetlands or drainage lines (if unavoidable) should be restricted to a working area 10m in width either side of the road, and these working areas should be clearly demarcated. No vehicles, machinery, personnel, construction material, cement, fuel, oil or waste should be allowed outside of the demarcated working areas; No fuel storage, refuelling, vehicle 		

Activity	Impact summary	Significance	Proposed mitigation
			maintenance or vehicle depots should
			be allowed within 30m of the edge of
			any wetlands or drainage lines;
			• Refuelling and fuel storage areas, and
			areas used for the servicing or parking
			of vehicles and machinery, should be
			located on impervious bases and
			should have bunds around them.
			Bunds should be sufficiently high to
			ensure that all the fuel kept in the area
			will be captured in the event of a major
			spillage;
			• Vehicles and machinery should not be
			washed within 30m of the edge of any
			wetland or drainage line;
			• No effluents or polluted water should be
			allowed to discharge into any drainage
			lines or wetland areas;
			• If construction areas are to be pumped
			of water (e.g. after rains), this water
			should be pumped into an appropriate
			settlement area, and not allowed to flow
			straight into any drainage lines or
			wetland areas;
			Freshwater ecosystems located in
			close proximity to construction areas
			(i.e. within ~30 m) should be inspected
			on a regular basis by the ECO for signs
			of disturbance from construction
			activities, and for signs of
			disturbance acdimentation or pollution
			are noted immediate action should be
			token to remody the situation and if
			personal and the situation and, in
			should be consulted for advice on the
			most suitable remediation measures:
			The construction footprint along the
			Watercourse must be limited to as small
			a footprint as possible: and
			a loophint as possible, and
			• If a hydrocarbon spillage occurs, clean
			appropriate registered landfill site
Degradation of	Direct Impact	VeryLow	Ensure that phylon structures are kent
watercourses due	Degradation of		a minimum of 50m outside of the outer
to the construction	the watercourse		edge of any watercourse or drainage
of the proposed	due to the		lines:
powerline and	erection of the		 Use existing access roads as far as
infrastructure	cable		possible;

Activity	Impact summary	Significance	Proposed mitigation
			Construction impacts must be
			contained within the servitude of the
			powerline;
			No mixing of cement/concrete should
			take place within 30m of aquatic
			features;
			• All wetlands and drainage lines should
			generally be treated as "no-go" areas
			and appropriately demarcated as such.
			No vehicles, machinery, personnel,
			construction materials, cement, fuel, oil
			or waste should be allowed into these
			areas without the express permission of
			and supervision by the ECO;
			Construction activities associated with
			the establishment access roads
			through wetlands or drainage lines (if
			unavoidable) should be restricted to a
			working area 10m in width either side of
			the road, and these working areas
			should be clearly demarcated. No
			venicies, machinery, personnei,
			construction material, cement, fuel, oil
			or waste should be allowed outside of
			the demarcated working areas;
			Construction camps, tollets and temporary loydown group should be
			lected at least 20m from the edge of
			any wetlands and drainage lines:
			 No fuel storage refuelling vehicle
			maintenance or vehicle denots should
			be allowed within 30m of the edge of
			any wetlands or drainage lines.
			 Vehicles and machinery should not be
			washed within 30m of the edge of any
			wetland or drainage line:
			 No effluents or polluted water should be
			allowed to discharge into any drainage
			lines or wetland areas;
			If construction areas are to be pumped
			of water (e.g. after rains), this water
			should be pumped into an appropriate
			settlement area, and not allowed to flow
			straight into any drainage lines or
			wetland areas;
			• Freshwater ecosystems located in
			close proximity to construction areas
			(i.e. within ~30 m) should be inspected
			on a regular basis by the ECO for signs

Activity	Impact summary	Significance	Proposed mitigation
Activity Floral destruction and faunal displacement due to vegetation clearance activities taking place along	Impact summary Direct impact Loss of flora and fauna due to construction activities	Significance	 Proposed mitigation of disturbance from construction activities, and for signs of sedimentation or pollution. If signs of disturbance, sedimentation or pollution are noted, immediate action should be taken to remedy the situation and, if necessary, a freshwater ecologist should be consulted for advice on the most suitable remediation measures; Workers should be made aware of the importance of not destroying or damaging the vegetation along drainage lines and in wetland areas, of not undertaking activities that could result in the pollution of drainage lines or wetlands, and of not killing or harming any animals that they encounter. This awareness should be promoted throughout the construction phase (and decommissioning phase, if this takes place); Ensure that unnecessary impacts on watercourse do not occur; and Proper erosion control structures must be constructed. Construction impacts must be contained within the footprint of the pylon structures and / or the servitude routes of the powerline; Use existing access roads as far as
Floral destruction and faunal displacement due to vegetation clearance activities taking place along the proposed powerline alignments and servitude routes	Direct impact Loss of flora and fauna due to construction activities	Very low	 watercourse do not occur; and Proper erosion control structures must be constructed. Construction impacts must be contained within the footprint of the pylon structures and / or the servitude routes of the powerline; Use existing access roads as far as possible; Vegetation clearance should be conducted systematically from the start to the end of the route to allow fauna to move away; Avoid strip clearing; Vegetation should be removed only
			 where construction is to take place; Sequential construction should occur in order to allow faunal species to move away from the area of disturbance; Construction activities should be restricted to daylight hours when the majority of faunal species are inactive; No animals may be snared, captured or wilfully damaged or killed; Species such as tortoises and porcupines should be removed to be removed.

Activity	Impact summary	Significance	Proposed mitigation
			surrounding areas if encountered on
			site and not collected as this is illegal;
			• During construction phase, existing
			access roads should be used where
			possible especially in the wooded
			habitats where a lot of vegetation will
			have to be removed if there is no
			access;
			• Clearing of the servitude should be as
			narrow as possible to prevent major
			destruction of habitats;
			• No trees may be affected in the
			grassland habitats where sufficient
			space is available for the tweaking of
			pylon positions;
			• A road management plan should be
			complied, showing allocated access
			points and roads, to prevent tracks all
			The removal of large sections of
			• The removal of large sections of wooded areas
			should be avoided
Increased noise	Direct impact	Vervlow	Construction time must be restricted to
generation due to	The construction	Voly Low	working hours (07:00-18:00) Monday to
construction	activities will		Friday excluding public holidays (unless
activities and the	cause an increase		prior permission is obtained from the
construction	noise levels		landowners);
vehicles			• All noise and sounds generated during
			the proposed activity must comply with
			the relevant SANS codes and
			standards;
			All construction equipment or
			machinery should be switched off when
			not in use;
			Construction equipment must be kept in
			good working condition;
			Plant and vehicles must be in good
			working order and inspected daily; and
			Ose silencers on all equipment, where
Increased dust	Direct impact	Vorulow	Appropriate.
generation due to	Construction		suppression (as far as is practically
the clearing of	activities will		nossible) Alternative dust suppression
vegetation,	cause an increase		methods (such as shade cloths or
construction activities and	in ampient dust levels for a short		dusticide) must be used instead:
earthworks	period of time		Water to be used sparingly and only
			where no water restrictions are in
			effect;

Activity	Impact summary	Significance	Proposed mitigation		
Activity Increased occurrence of fires due to unmanaged fires and its increased severity	Impact summary Direct impact Increased risk of damage due to unmanaged fires	Significance Very Low	 Proposed mitigation Water to be sourced from an approved supplier; The option to use grey water should be investigated prior to construction; The soil must be dampened with water during/ after vegetation removal (where practical); The clearing of vegetation must be kept to the minimal; and Avoid unnecessary movement of construction vehicles on site. The safety officer should control on-site fires; Firefighting equipment to be kept on site and serviced regularly; and 		
due to human interference			 No fires to be lit on site and smoking to occur in designated areas only. 		
Increased damage to farm roads due to the continued travelling of vehicles on minor and gravel roads during the construction phase	Direct impact Increased damage to local roads due to increased traffic volumes	Very Low	 Limit construction vehicles to 20km/h on access roads and keep to the speed limit on public roads; and Regular monitoring of roads for damage must be undertaken, followed by immediate repair of any damage resulting from use of heavy machinery. 		
Increase in traffic volumes and associated congestion due to the transportation and construction vehicles travelling to and from the construction site	Direct impact Increase in traffic congestion due to the construction vehicles	Very Low	 Limit construction vehicle movement during peak periods. 		
Change in visual aesthetics due to construction activities, placement of construction equipment and disposal of construction waste material	Direct impact Adjacent residents may be visually impacted on the unsightliness of the construction camp (depending on the location fo the camp).	Very Low	 Construction vehicles should be kept in demarcated areas only so as to reduce the visual intrusion of the construction activities; During construction, all materials and stockpiles will be covered with tarps to prevent erosion, as well as dust arising from it, and to mitigate the visibility thereof (where required and as directed by the ECO); Construction workers must ensure and implement good housekeeping practises to minimise the visual impact of waste and discarded materials; and Construction activities to be kept to 		
Activity	Impact summary	Significance	Proposed mitigation		
---	---	--------------	--	--	--
			normal daytime working hours as far as possible to prevent the impact of floodlights and other sights during resting hours.		
Soil contamination due to spillage of hazardous substances, oil and fuel leaks at the construction site from the transportation and construction vehicles as well as accidental spillages	Direct impact Degradation of the soil due to spillages	Very Low	 Store fuels and chemicals in an impermeable bunded area; Provide staff with hazardous materials training; Chemical toilets to be used on site, grey water should be disposed of offsite at a licensed waste treatment works; No storage of fuel on site, vehicles to be fuelled off-site; No mixing of cement/concrete should take place within 30m of aquatic features or in natural vegetation; No servicing or repair of vehicles on site (unless absolutely necessary); No concrete mixing on site unless on a mortar board; Water used to clean concrete off of machinery should be treated as grey water and disposed of at a licensed water treatment works; Construction vehicles should be maintained on a regular basis so as to prevent oil spills/leaks; Drip trays should be places under vehicles when not in use; and If a hydrocarbon spillage occurs, it must be cleaned up immediately and disposed of at an appropriate registered landfill site. 		
Increased domestic waste generation (solid waste) and left unmanaged on site to attract vermin	Direct impact Unsightly litter on site	Very Low	 Keep waste in vermin proof bins with lids (as needed); and Waste to be removed from site on a regular basis. 		
Loss of Riparian vegetation along watercourse crossings and drainage lines due to the construction of the powerline	Direct impact Loss of riparian vegetation due to construction vehicles	Very Low	 No access roads should be constructed within 32m of a hill slope seepage wetland and/or seasonal pan, unless no alternative is possible; and If access roads/ tracks must pass through drainage lines, the footprint should be a small as possible. 		
Increased risk of alien invasion for	<i>Direct impact</i> Increase in alien	Very Low	 An alien management plan must be implemented as directed by the ECO. 		

Activity	Impact summary	Significance	Proposed mitigation
vegetation species due to unmanaged vegetation clearing activities taking place on site	invasive species due to vegetation clearing activities		The plan should limit vegetation clearing to the servitude of the powerline and no more. This plan must be developed prior to construction.
Loss of avifauna and roosting sites due to the clearance of vegetation for the powerline servitude	Direct impact Loss of avifaunal species and roosting sites	Very Low	 The construction corridor of the selected alignment should be closely inspected before the start of construction in order to locate any active nests; Reduce the construction time where possible and schedule construction activities around avian breeding schedules where practical; Lower the levels of associated noise; and Restrict the construction activities to the footprint area. Do not allow any access to the remainder of the properties. Make maximum use of existing roads.
Destruction of natural spring located south of the N4 highway where Itaelo takes place (Collection of water for religious purposes – High Local Heritage Significance)	Direct impact Loss of heritage resource constituting a high local significance	Very low	 Avoid any impact on the natural spring area during construction activities. Placement of pylon structures within the natural spring will not be permitted.
Increase in crime due to the creation of additional access roads and or thoroughfares to surrounding areas during the construction phase	Direct impact Increase in crime due to increase in workers within the town	Very Low	 Workers will not be allowed to stay overnight at the crew camps unless authorised by the ECO (as applicable).
Impacts on Class 2 Magaliesberg Ridge and associated sensitive species during the construction of the proposed powerline and associated infrastructure	Direct impact Loss of sensitive fauna and flora species	Very Low	 Limit construction activities to the footprint of the powerline servitude; and Ensure that pylon structures are located outside the immediate reaches of the Class 2 ridge area.
Temporary job creation during the construction of the proposed powerline and associated	Direct impact Unskilled labour force may be required for construction	Low Positive	The development should proceed and should employ local labour as far as possible.

Activity	Impact summary	Significance	Proposed mitigation
infrastructure	activities		
Potential increase in HIV/ AIDS in the area due to construction workers (migrant labour) associated with the proposed development	Indirect impact Due to the increase in workforce within the town, there may potentially be an increase in sexually transmitted diseases	Very Low	HIV & AIDS awareness talks should be given to the workers on a regular basis by the relevant personnel.
Impacts on agriculture potential and expansion due to the placement of the pylon structures in existing potential farm lands resulting in the minor loss of arable land or potential expansion of farming activities	Indirect impact Due to the location of pylon structures and the servitude restrictions, farming activities may be compromised	Very Low	 Locate pylon structures within natural fire breaks within the currently farmed areas (where possible). Compensate farmers for the loss of arable land / servitude restrictions.
Our section of Discourse			
Economic growth and development in the surrounding area due to the strengthening of the existing electricity network to a point where it is stable and reliable and allowing future development and expansion of operations in the area	Direct impact Due to the powerline stabling the electricity grid and allowing for future development- economic benefits will be realised	Medium Positive	Continue with the proposed development and ensure that the line is maintained.
Increased theft and vandalism of the distribution line and associated infrastructure resulting in the occurrence of potential deaths, interruption in electricity supply and the increased maintenance intervals	Direct impact Increase in theft of electrical cables	Very low	 Install anti-climb pylons; and Access control at the substation needs to be implemented.

Activity	Impact summary	Significance	Proposed mitigation		
Increased risk of alien invasion for vegetation species due to the disturbance in the landscape during operational and maintenance activities	Direct impact Increase in alien invasive species	Very low	 Areas disturbed due to maintenance activities should be rehabilitated as quickly as possible; Soil stockpiles should not be translocated from areas with alien plants into the site; Within the site, alien plants on stockpiles must be controlled so as to avoid the development of a solid seed bank of alien plants within the stockpiled soil; Any alien plants must be immediately controlled to avoid establishment of a soli seed bank; and Create an integrated alien invasive management programme to be implemented during maintenance activities. 		
Increased collision and electrocution of avifauna and resulting mortality of these large terrestrial bird species due to building nests on pylon structures	Direct impact Loss of avifauna due to electrocution and collisions	Very low	 Informed selection of low impact alignments for new powerlines relative to movements and concentrations of high risk species; Use of either static or dynamic marking devices to make the lines and the earthwires more conspicuous; Ensure that all new lines are marked with bird flight diverters along their entire length using industry standard markers and marker fitting protocols; Identified high risk sections of the powerline needs to be installed with a suitable anti-bird collision marking device approved by Eskom, and as per the Eskom standards; Fit bird perching bracket to the top of the pole; Due to the potential for nocturnal collisions it is recommended that the experimental LED bird flapper is used. 		
Increased alteration of hydrology of drainage lines and wetlands due to the establishment of distribution line pylons within or immediately adjacent to freshwater ecosystems	Direct impact Alteration of watercourses due to the establishment of the pylons within the watercourse due to maintenance activities	Very low	 Use existing access roads where possible; Do not establish new access roads within drainage lines; and Limit maintenance footprint within drainage lines. 		

Activity	Impact summary	Significance	Proposed mitigation
Floral destruction and faunal displacement due to clearing or trimming of natural vegetation located within the servitude of the powerline as part of routine maintenance operations	Direct impact Maintenance activities resulting in the loss of flora and fauna	Very low	 Maintenance impacts must be contained within the footprint of the phylon structures and / or the servitude routes of the powerline; Ensure that unnecessary impacts on natural vegetation do not occur; Vegetation clearance should be conducted systematically from the start to the end of the route to allow fauna to move away; Avoid strip clearing; Maintenance activities should be restricted to daylight hours when the majority of faunal species are inactive; and No animals may be snared, captured or wilfully damaged or killed.
Degradation of the cultural landscape and scenic qualities of the environment due to the proposed powerline extending across such landscape	Direct impact Visual intrusion of the powerline	Very low	 Align the power line as close as possible to existing powerlines so as to keep visual impacts clustered.
Increased soil erosion due to the deterioration of access roads to the powerline servitude for operation and routine maintenance activities	<i>Indirect impact</i> Soil erosion due to maintenance activities	Very low	 Apply the appropriate erosion protection measures where erosion is identified; Regular maintenance of the identified access roads as and when required; Improve the access of the identified access roads to ensure suitable passage for equipment, erosion control and maintenance of proper drainage; and Maintenance staff to stay on the designated access roads at all times.
Stimulation and growth of the local economy due to the provision of a stable electricity supply which will lead to the steady growth and economic development of the surrounding regions	Cumulative impact Taking into consideration the future infrastructural upgrades that will occur, the local economy will increase	High Positive	 Infrastructure maintenance should be prioritised to ensure that the provision of stable electricity is not interrupted and future upgrades along this corridor should be encouraged.

Decommissioning Phase						
Please note that due to the nature of the project and the fact that the project is an infrastructural project, decommissioning is not envisaged. However should decommissioning occur, the following impacts may be applicable:						
Waste generation in the forms of generating metal and concrete waste during decommissioning activities	Direct impact Solid waste generation due to decommissioning activities.	Very low	 Waste generation must be managed according to Eskom's guidelines and standards; and All materials that can be recycled must be recycled where possible. The rest of the rubble must be disposed of at an appropriate landfill site. 			
Natercourse and Soil contamination due to hydrocarbon spills which may occur from vehicles to be used to carry out various decommissioning activities	Soil and watercourse degradation due to decommissioning activities	very iow	 Contaminated soil must be removed and disposed of at an appropriate registered landfill site; Heavy vehicles must be service and maintained regularly; No fuel storage, refuelling, vehicle maintenance or vehicle depots should be allowed within 30m of the edge of any wetlands or drainage lines; No effluents or polluted water should be allowed to discharge into any drainage lines or wetland areas; and The construction footprint along the watercourse must be limited to as small a footprint as possible. 			
THE PROPOSED IM EXCEPTION OF THE	PACTS WILL BE TH E FOLLOWING:	E SAME AS THA	T FOR ALTERNATIVE 1 WITH THE			
Construction Phase						
Impacts on Class 2 Magaliesberg Ridge and associated sensitive species during the construction of the proposed powerline and associated infrastructure	Direct impact Loss of sensitive fauna and flora species	Very Low	• Limit construction activities to the footprint of the powerline servitude; and Ensure that pylon structures are located outside the immediate reaches of the Class 2 ridge area.			
Degradation of watercourses due to the construction of the proposed powerline and associated infrastructure	Direct Impact Degradation of the watercourse due to the erection of the pylons and 132kV cable	Very Low	 Ensure that phylon structures are kept a minimum of 50m outside of the outer edge of any watercourse or drainage lines; Use existing access roads as far as possible; Construction impacts must be contained within the servitude of the powerline; No mixing of cement/concrete should 			

		take place within 30m of aquatic
		features;
		• All wetlands and drainage lines should
		generally be treated as "no-go" areas
		and appropriately demarcated as such.
		No vehicles, machinery, personnel,
		construction materials, cement, fuel, oil
		or waste should be allowed into these
		areas without the express permission of
		and supervision by the ECO;
		Construction activities associated with
		the establishment access roads
		through wetlands or drainage lines (if
		unavoidable) should be restricted to a
		working area 10m in width either side of
		the road, and these working areas
		should be clearly demarcated. No
		vehicles, machinery, personnel,
		construction material, cement, fuel, oil
		or waste should be allowed outside of
		the demarcated working areas;
		• Construction camps, toilets and
		temporary laydown areas should be
		located at least 30m from the edge of
		any wetlands and drainage lines;
		• No fuel storage, refuelling, vehicle
		maintenance or vehicle depots should
		be allowed within 30m of the edge of
		any wetlands or drainage lines;
		• Vehicles and machinery should not be
		washed within 30m of the edge of any
		wetland or drainage line;
		• No effluents or polluted water should be
		allowed to discharge into any drainage
		lines or wetland areas;
		• If construction areas are to be pumped
		of water (e.g. after rains), this water
		should be pumped into an appropriate
		settlement area, and not allowed to flow
		straight into any drainage lines or
		wetland areas;
		• Freshwater ecosystems located in
		close proximity to construction areas
		(i.e. within ~30 m) should be inspected
		on a regular basis by the ECO for signs
		of disturbance from construction
		activities, and for signs of
		disturbance addimentation. If signs of
		assurbance, seamentation or pollution
1	1	are noted, immediate action should be

			taken to remedy the situation and, if
			necessary, a freshwater ecologist
			should be consulted for advice on the
			most suitable remediation measures;
			• Workers should be made aware of the
			importance of not destroying or
			damaging the vegetation along
			drainage lines and in wetland areas, of
			not undertaking activities that could
			result in the pollution of drainage lines
			or wetlands, and of not killing or
			harming any animals that they
			encounter. This awareness should be
			promoted throughout the construction
			phase (and decommissioning phase, if
			this takes place);
			• Ensure that unnecessary impacts on
			watercourse do not occur; and
			Proper erosion control structures must
			be constructed.
Operational Phase	•		
THE PROPOSED I	MPACTS WILL BE TH	E SAME AS THA	T FOR ALTERNATIVE 1
Decommissioning	Phase		
THE PROPOSED I	MPACTS WILL BE TH	E SAME AS THA	I FOR ALTERNATIVE 1
No-go option			
No additional job	Direct impacts:	High negative	Commence with the proposed
creation	No additional jobs		powerline construction
	the construction		
	of the powerline		

	or the powerline						
	does not						
	commence						
Inhibition of	Direct impacts:	High negative	•	Commence	with	the	proposed
economic growth	If the powerline is			powerline cor	nstructior)	
and development	not constructed,						
	inhibition of the						
	economic growth						
	and development						
	of the surrounding						
	regions will occur.						

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

COMPARATIVE SUMMARY OF THE FINDINGS FOR THE ALTERNATIVE 1 AND 2 SUBSTATION SITES:

**Please note that the impacts associated with Substation site Alternative 1 and 2 are very similar and as such no significant difference in terms of impact significance can be used as motivation in selecting one of them as the preferred option. Based on this information, either one of the substation sites will be acceptable from the EAPs point of view.

COMPARATIVE SUMMARY OF THE FINDINGS FOR THE ALTERNATIVE 1 AND 2 ROUTING OPTIONS:

Factors influencing the preferred Alternative	Alternative 1	Alternative 2 (preferred)
<u>Wetland Impact</u>	Alternative 1 is the only alternative which intersects the identified channelled valley bottom wetland. This wetland feature constitutes a high Based on the reason provided above, Alternative 1 is <u>not</u> considered to be the preferred option.	Alternative 2 completely avoids the identified channelled valley bottom wetland and as such will not impact on this sensitive feature in any way <i>Alternative 1 is therefore supported as being the preferred option.</i>

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 <u>after</u> 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.

A composite environmental sensitivity map has been compiled to outline all the environmental sensitivities from the respective specialists on this project, overlain on one another. Please refer to Figure 17 below for the composite sensitivity map.



Figure 17: Composite environmental sensitivity map of the study area and proposed powerline

Substation Site Alternative 1

It has been illustrated that with the implementation of the above mitigation measures and Environmental Management Programme, all the identified impacts can be mitigated to acceptable levels, thus allowing the proposed development to proceed.

Impacts associated with Substation site Alternative 1 can all be mitigated to have an overall significance of <u>low</u> to <u>very low</u>. Impacts associated with both substation sites are very similar and as such no significant difference in terms of impact significance can be used as motivation in selecting one of them as the preferred option.

Based on the information above, either one of the substation sites will be acceptable from the EAPs point of view..

Substation Site Alternative 2

It has been illustrated that with the implementation of the above mitigation measures and Environmental Management Programme, all the identified impacts can be mitigated to acceptable levels, thus allowing the proposed development to proceed.

Impacts associated with Substation site Alternative 2 can all be mitigated to have an overall significance of <u>low</u> to <u>very-low</u>. Impacts associated with both substation sites are very similar and as such no significant difference in terms of impact significance can be used as motivation in selecting one of them as the preferred option.

Based on the information above, either one of the substation sites will be acceptable from the EAPs point of view.

Route Alternative 1

It has been illustrated that with the implementation of the above mitigation measures and Environmental Management Programme, all the identified impacts can be mitigated to acceptable levels, thus allowing the proposed development to proceed. Impacts along both alternative routes are very similar with only a few differences in significance for some identified impacts.

Alternative 1 is the only alternative which intersects **the identified channelled valley bottom wetland** even though it extends along the same alignment as the N4. Given that this alternative will have a greater impact on the wetland features of the area (as compared to Alternative 2 which completely avoids the wetland feature), this alternative is therefore deemed unfavourable due to its greater impact on the receiving environment. All impacts associated with alternative 1 are mainly of a <u>short – medium term</u>, with a significance of <u>medium low to low</u> (with the implementation of mitigation measures).

Further to this, the wetland feature identified along route Alternative 1 constitutes a high environmental sensitivity and subsequent importance.

Based on the reasons provided above, route Alternative 1 is not supported by the EAP.

Alternative 2 (preferred alternative)

It has been illustrated that with the implementation of the above mitigation measures and Environmental Management Programme, all the identified impacts can be mitigated to acceptable levels, thus allowing the proposed development to proceed. There are no significant differences in terms of environmental impacts between route alternative 2(a) - (d) in order to motivate from an environmental point of view which one is preferred. Further to this, impacts along route alternative 1 and 2 are also very similar with the exception of Alternative 2 completely avoiding the wetland feature identified in the eastern end of the study area. The complete avoidance of all impacts on the wetland feature therefore also further motivates this alternative as being the preferred option. All impacts associated with alternative 1 are mainly of a <u>short – medium term</u>, with a significance of <u>low</u> <u>– very low</u> (with the implementation of mitigation measures).

The smaller footprint on watercourse features implies that this alternative will have a smaller environmental impact.

It should be noted that all environmental impacts associated with alternative 2 are mainly of a <u>short</u> <u>– medium term</u>, with a significance of low to very-low and can be successfully mitigated to acceptable levels if the recommended mitigation measures in the EMPr are adhered to.

Based on the information above, route Alternative 2 is preferred from the EAPs point of view with the connection to either one of the substation site alternatives.

No-go alternative (compulsory)

This option in the context of this project implies that the powerline and associated substation is not to be constructed and therefore assumes that a conservative approach is followed. This would ensure that the environment is not impacted upon any more than is currently the case. It is important to state that this assessment is informed by the current condition of the area. Should the authorities decline the application, the 'No-Go' option will be followed and the status quo of the site will remain.

With the No-Go alternative being followed, no additional jobs will be created during the construction and possibly during the operational phase. The current unstable supply of electricity throughout the study area is likely to inhibit or slow down the economic growth and development of the surrounding regions in the <u>Medium - Long term</u>. The need for stable and reliable power supply to meet current and future demand will outweigh the potential impacts to the surrounding environment. The Impacts to the surrounding environment is expected to be of low to medium significance, at best, and can be proactively mitigated to acceptable levels. Therefore the no-go alternative is <u>not preferred</u>.

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)?

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.

- The EMPr is a legally bounding document and must be implemented;
- No pylon structures should be erected within a drainage line;
- Bird diverters should be installed along the proposed powerline route;
- An independent ECO must be appointed to ensure compliance with the EMPr; and
- A Water Use License must be obtained prior to construction.

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**.

Wante

SIGNATURE OF EAP

<u>10/03/2015</u> DATE



YES	
Х	NO

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