

# 1 INTRODUCTION

## 1.1 Electricity Generation, Transmission and Distribution - Overview

Electricity is generated, supplied and distributed by Eskom via a network called a “Grid”. The amount of electricity being fed into the grid must always match what the customers are taking out. The amount of electricity required by the customers varies not just from day to day, but from minute to minute. As electricity demand increases, and loads are connected, more power stations and associated substations and lines need to be built to meet the electricity demands. A diagram of the Eskom Supply Chain is provided in Figure 1 below.

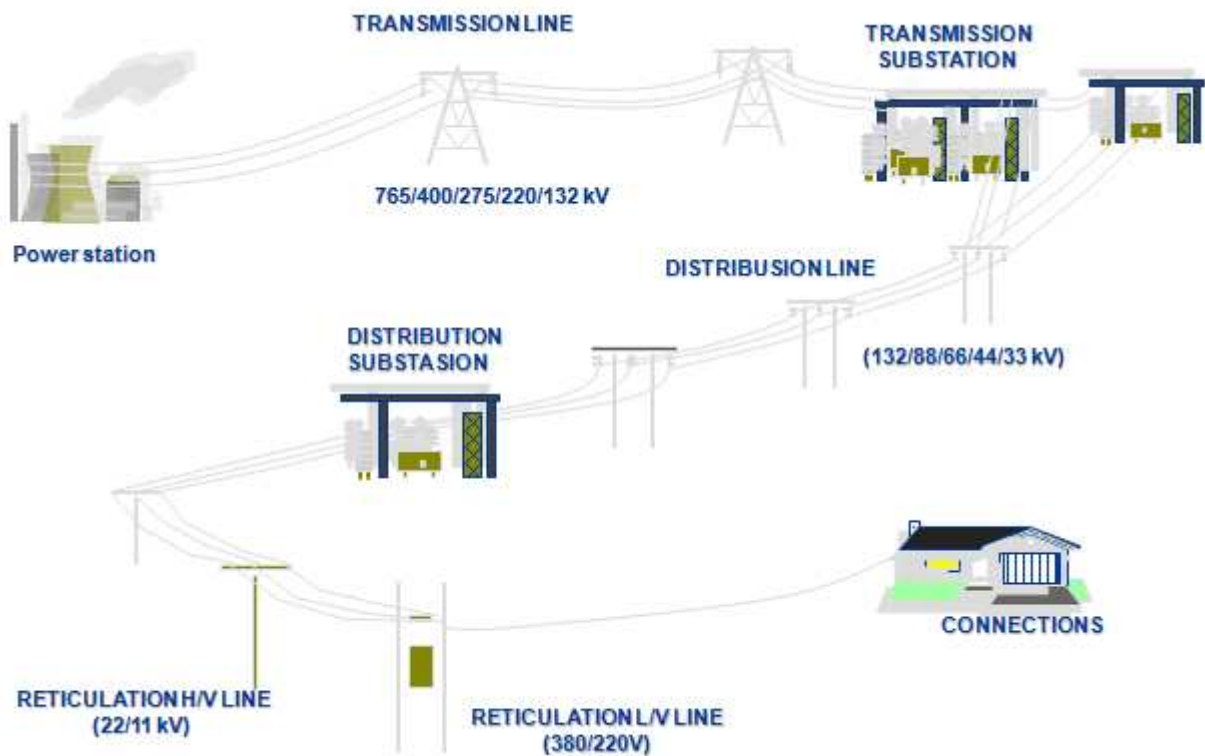


Figure 1: Eskom Supply Chain

Eskom produces electricity at power stations. Most of the power stations in South Africa are located near coal mines in Mpumalanga and the Waterberg area in the Northern Province. The largest load centres are located in Gauteng, the Western Cape and Kwa-Zulu Natal.

After electricity is generated at the power station, it is sent from the power stations to the load centres via high voltage power lines. As electricity leaves the power station, the electricity is boosted by a step-up transformer to voltages such as 400kV, 275kV and 132kV. Electricity is “stepped down” to voltages used for distribution to customers. A diagram of the Eskom Supply Chain is provided in Figure 1 below.

### 1.2 Background and Motivation: Anderson Dinaledi 400kV Powerline

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The Medupi integration identified the need for the new 2 x Spitskop-Dinaledi 400kV lines to transmit power further into the grid beyond Spitskop. The Dinaledi Main Transmission Substation (MTS) is the main node to link the Waterberg generation and the Mpumalanga pools. Dinaledi MTS is connected by 400kV lines to Bighorn (Rustenburg), Apollo (Pretoria) and will be connected by 2x400kV lines to Spitskop (Northam). This meshed network will be linked to the Central Grid by establishing a new 400kV line from Dinaledi MTS to a new substation called Anderson.

Over the past 15 years, load in the Pretoria area has increased by 80%. This load is anticipated to double in the next 20-30 years, to meet the future electricity requirements in this area and as part of the Tshwane Strengthening project a new substation named Anderson is proposed to feed the Hartebeespoort and neighbouring areas. This new substation will be linked to the existing Dinaledi Main Transmission Substation by a 40km 400kV line.

The proposed Anderson substation will be located to the north of the Pelindaba nuclear facility. The Dinaledi – Anderson 400kV line will transmit power from Dinaledi to the Central Grid and strengthen it. This will ensure that the transmission system north of Johannesburg, Brits and Rustenburg are heavily meshed. This will improve the reliability of the Transmission system and sustain economic growth in the three areas.

## 1.3 Project Details

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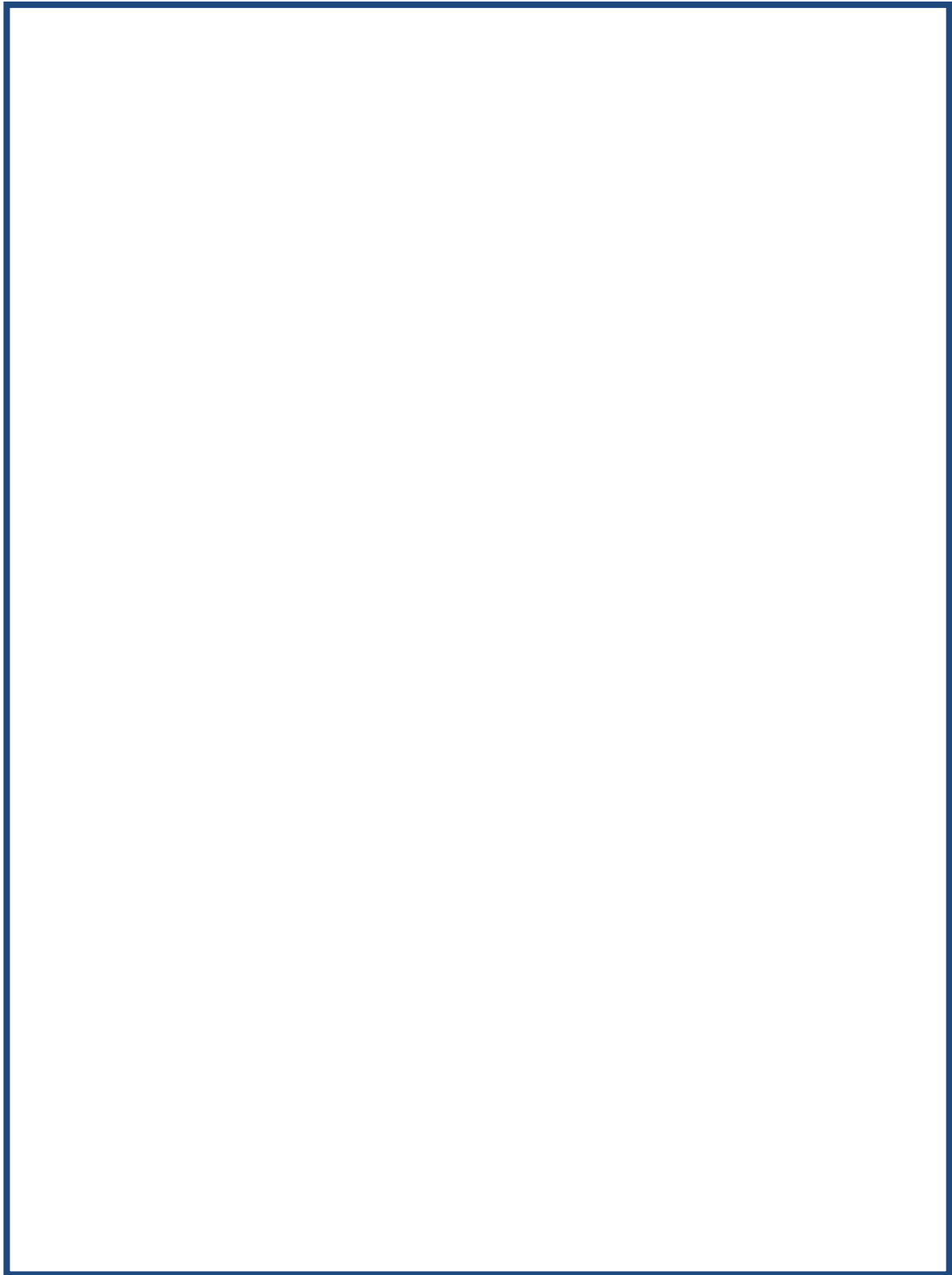
### 1.3.1 Description

Eskom Holdings Limited is proposing the construction of a new 400kV Transmission Line, and a proposed new 400kV Substation as part of their Tshwane Strengthening Scheme Project. The proposed powerline will be approximately 40km in length and will run between the proposed new Anderson Substation, which will be located to the north of the Nuclear Energy Corporation of South Africa (NECSA), located in Broederstroom, to the existing Dinaledi Substation which is located approximately 8km North East of Brits. The proposed powerline will be constructed in the following two Municipal Areas: Madibeng Local Municipality (North West) and the City of Tshwane Local Municipality (Gauteng). The proposed substation is earmarked for construction within the Madibeng Local Municipality. Please note that a separate Environmental Impact Assessment process is being undertaken for the proposed Anderson 400kV Substation.

### 1.3.2 Location

The Dinaledi Substation is located on Portion 843 of the Farm Roodekopjes of Zwartkopjes 427 JQ, which is located approximately 8km North East of Brits. Two site alternatives are being investigated for the proposed construction of the Anderson Substation. These two site alternatives are located directly to the north of NECSA, in Broederstroom. Three alternative powerline routes have been identified (refer to the locality map attached to Appendix A, and to Figure 2). A 1km buffer area has been placed around each alternative route, which will form the study area/corridor to be investigated during the Scoping and EIA Phase. During the EIA Phase a preferred study area/corridor will be selected. The Department of Environmental Affairs (DEA) may authorise the identified preferred corridor, the Department may authorise one of the other corridors, or the Department may request that additional information be submitted in order to make a decision regarding the proposed project. Once DEA authorises a corridor, a walk down survey will be undertaken by suitably qualified specialists in order to determine the exact location of the powerline.

Several properties are located within these 1km study areas/corridors. Details of the affected properties are provided in Section 1.4 and 1.5 of this Report.



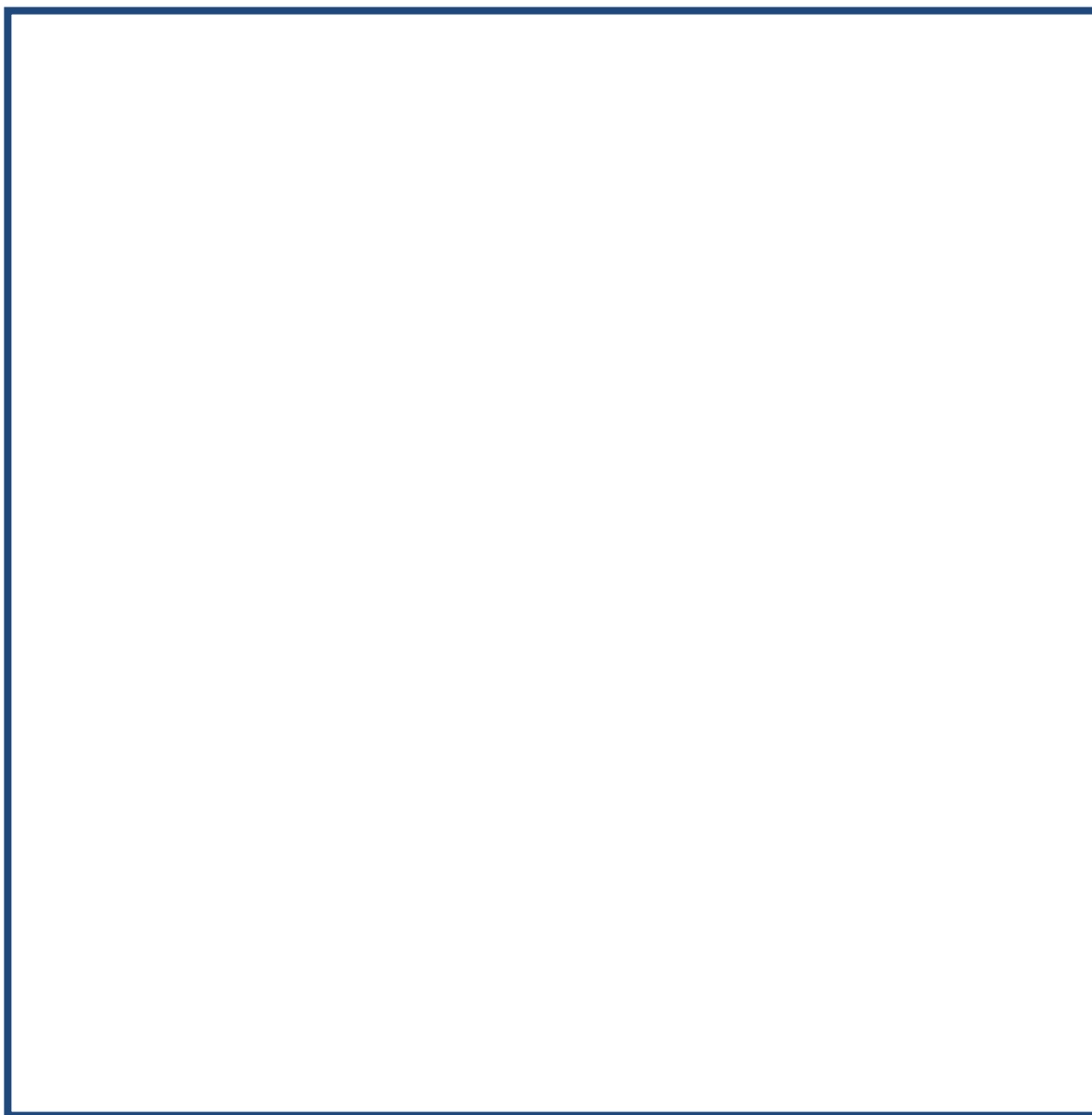
**Figure 2: Locality Map**

### 1.3.3 Construction Footprint/Construction Details

The proposed powerline requires a servitude width of 55m (27.5m on either side of the center of the powerline). Generally, the pylons to be used for the powerline can be spaced at 350m to about 550m apart, depending on the type of pylon used, location of the bend points, topography and sensitive areas. The type of Pylons used is dependent on bend points, conductor configuration, voltage level and topography. A minimum vertical of clearance of 8.1m between the line and the ground will be required after construction.

The purpose of the servitude is to ensure public safety, and safe construction, maintenance and operation of the line. Eskom will be entitled to unrestricted access. Access control measures and security issues with regards to locking and unlocking of gates on private properties and damage to fences and gates will be addressed in the Environmental Management Plan (EMP) which will be compiled as part of the Environmental Impact Assessment (EIA) Report. Access control may also form part of the negotiation process and agreements on access control could be drawn up between Eskom and the Landowner. The land beneath the overhead lines and within the 55m wide servitude may continue to be used for some activities by the landowners, however, no crops or trees higher than 4 m will be allowed along the route, and no structures may be developed underneath the line or within the servitude area.

Foundations for the pylon footings may be drilled, mechanically excavated, or dug by hand. It is unlikely that blasting will be required, however, this will only be known once an exact powerline route has been determined. Materials and equipment is transported to the construction site by road where possible and in areas where tower positions are inaccessible, helicopters will be used to transport materials and equipment. All incomplete excavation will be cordoned off to prevent human and animals from injury. The EMP will provide conditions on safety measures with regards to excavation. After compaction foundations are capped with concrete at ground level. After the tower foundations have been installed, the tower structure is lifted into position by cranes or helicopter; and the conductor is strung between the towers. Steel or wooden cable drums are then delivered to the construction sites. These drums are usually approximately 2.5 to 3m in size and contain 2.5km of cable. The cable drums are placed at 5km intervals in the cleared section of the servitude, and are passed 2.5km in each direction. Some examples of typical construction activities and equipment involved is illustrated in Figure 3.



**Figure 3: Construction Activities and Equipment**

The construction of the proposed powerline is expected to take between 12 and 24 months, and the expected commencement date of construction is early 2013. After EIA approval (should the project be approved), Eskom will commence with negotiations with the landowners to purchase a servitude on the affected properties. During this time the co-ordinates of the centre line of the route and position of the towers within the corridor approved by the authorities will be determined by surveyors. The construction process mainly consists of the following activities:

- Servitude and access road negotiations;
- Contractor site establishment;
- Survey and pegging of tower positions;

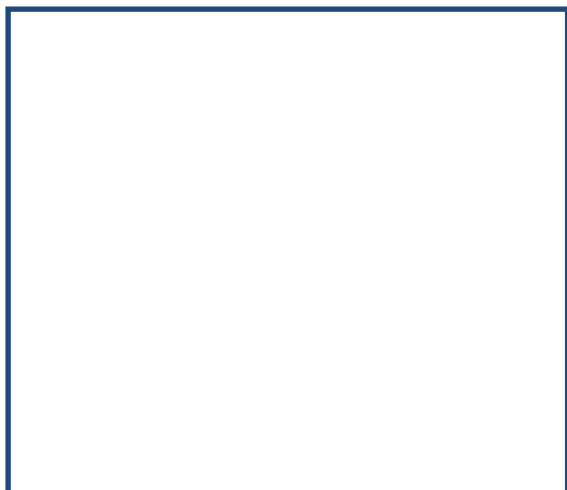
- Access road construction;
- Gate installation and vegetation clearing;
- Foundation excavation and installation;
- Tower assembly and erection;
- Conductor stringing and tensioning;
- Conductor testing; and
- Servitude clean-up and rehabilitation.

The establishment of construction camps along the route corridor to accommodate construction workers will be required. The amount of construction camps required and the number of workers to be housed at these camps is not yet known. The exact position of the construction camps will be negotiated with the relevant landowners. Management measures and conditions for the siting, operations and activities at these construction camps will be addressed in the EMP. Furthermore, an Environmental Control Officer (ECO) will undertake regular monitoring and auditing of all conditions stipulated within the EMP to ensure that all conditions are adhered to, and that any non-compliance to these conditions are addressed and resolved.

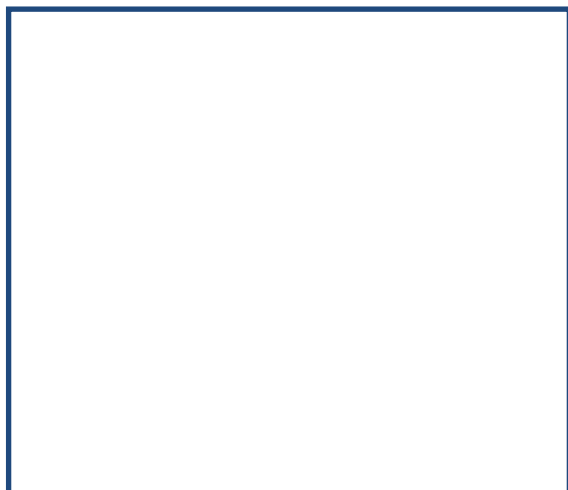
During the vegetation clearance phase, any plants that could interfere with the construction, maintenance or operation of the powerline, will be removed or trimmed in accordance with relevant legislation and the EMP. The EMP will specify standards and management measures which should be adhered to during vegetation clearing. It is normally required that an 8m wide strip directly underneath the proposed line be cleared of all vegetation for construction purposes. The 8m wide strip clearance applies to Bushveld areas. In areas where grassland occurs, the grasses are trampled by construction activities, construction vehicles, etc.

The type of foundation required for each tower is dependent on the geo-technical conditions found in the area. Each pylon/tower structure requires a specific minimum working area for the erection of the tower. The minimum working area required for the erection of a self-supporting strain tower is 40 m by 40 m, and for a cross-rope suspension tower is 50 m by 50 m.

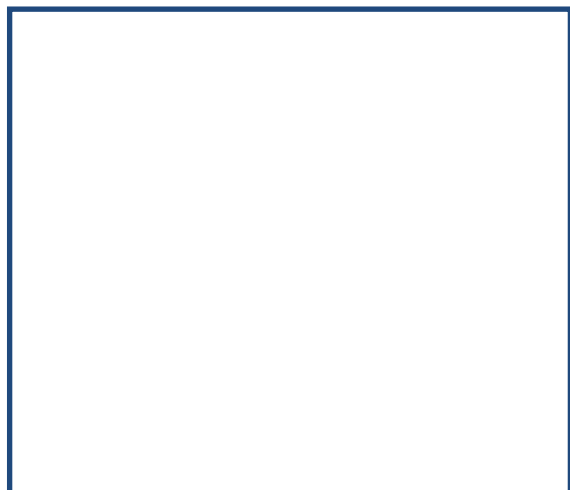
Refer to Figures 4 to 8 below for examples of towers which may be used during construction of the proposed powerline.



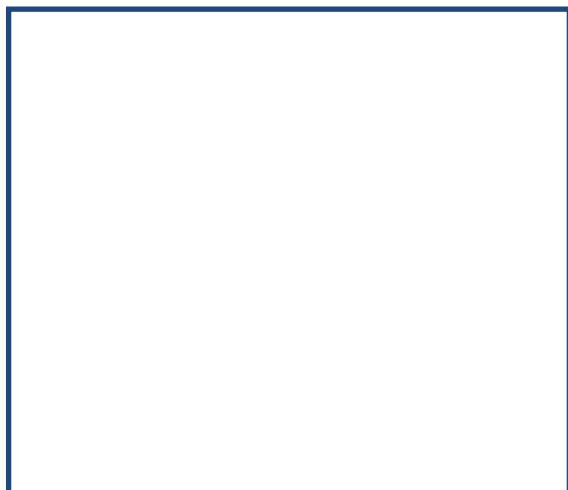
**Figure 4: Double Circuit Tower**



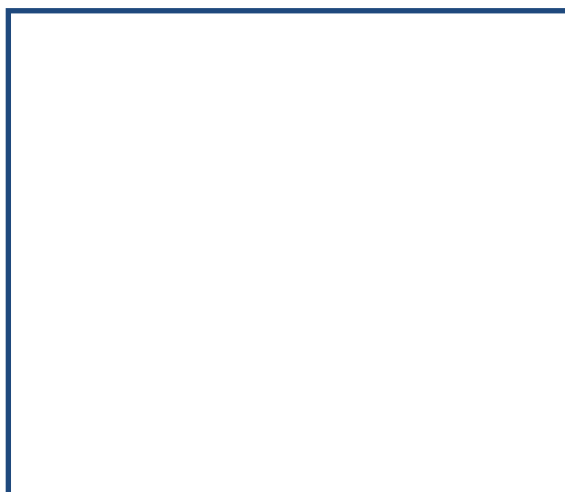
**Figure 5: Guyed V Tower**



**Figure 6: Guyed Cross-Rope Tower**



**Figure 7: Cross-Rope Tower**



**Figure 8: Self Supporting Tower**



### 1.3.4 Surrounding Land Uses

Land uses in the study area for the proposed powerline alternatives is mainly comprised of agriculture, mining, vacant land, conservation and tourism, industrial, commercial, recreational and residential.

### 1.3.5 Access

Existing main roads and farm access roads, should the landowner agrees will be utilised during the construction phase of the proposed powerline. Where existing roads does not exist access roads and roads for construction purposes will be developed. A maintenance road will be required in order for Eskom to undertake maintenance on the powerline. The maintenance road will be located within the 55m servitude. Roads developed for construction purposes which will not be used during maintenance procedures will be closed and rehabilitated at the end of the construction phase. Where roads needs to be developed on side slopes where the slope is steeper than 4%, cut and fill operations may be required to level the roads. Road construction and levelling will be undertaken in terms of the "Transmission Line Towers and Line Construction" (TRMSCAAC1 – Rev 3) document compiled by Eskom. This document provides certain specification for road construction and levelling to ensure that side slopes are stable. All roads to be constructed as part of the proposed project will most likely be gravel roads.

Where construction and maintenance roads intersect with fences gates need to be installed. Furthermore all existing infrastructure along the access and maintenance roads should be maintained in its existing condition. Access points and access roads needs to be negotiated with the landowners.

### 1.3.6 Zoning

Various land use zonings occur along the study area as various different types of land uses occur. Once a preferred corridor has been approved by the authorities, the exact location of the tower structures will be determined which will determine the exact location of the centre line. Eskom will then negotiate with all affected landowners to purchase a 55m wide servitude. The zoning of the affected properties will therefore not change, only an Eskom servitude will be registered on the affected properties. An application for rezoning may be required for the temporary construction camps, however, clarity on this matter needs to be obtained from the Local Municipalities.

### 1.3.7 Ownership

The proposed powerline will be approximately 40km in extent and will traverse many properties. Details of the properties affected are provided below in Sections 1.4 and 1.5.

## 1.4 Detailed Route Description (Directly Affected Properties)

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Please note that the alternative route descriptions are based on the 2006 Cadastral Information as obtained from the Surveyor General in Pretoria. Any subdivision or consolidations which were undertaken after 2006 will therefore not be reflected in the route alternative descriptions (Sections 1.4.2 – 1.4.4). Previous experience has shown that the Cadastre information is not always correct and that some subdivision and consolidation undertaken prior to 2006 may also not be reflected.

### 1.4.1 Route Selection Process and Alternative Identified

Eskom Grid Planning is responsible for establishing future electricity demands as a result of growth and development. Once an area has been identified where future growth will result in electricity constraints, methods for strengthening the grid to sustain future growth patterns is considered. The Tshwane Strengthening Scheme is one of these projects which were identified by Eskom to ensure a stable and efficient electricity supply for the future. After Eskom Grid Planning has identified the selected method to strengthen the grid, the various substations and powerlines which will be required for this project was identified.

The transmission line route selection process involves the consideration of various technical criteria to determine where a line could be located within the selected study area where grid strengthening is required. The technical criteria used by Eskom to determine the route alignments are includes inter alia the following:

- The cost of construction of Transmission Line Routes is directly proportional to the total length, therefore the longer the route the more expensive construction becomes, the shortest route between two points area therefore preferable;
- Bend towers on a Powerline are extremely expensive due to the large quantities of steel and the large foundations required to construct such towers, therefore the least amount of bends in a line is preferable;
- The maximum angle for a bend tower is 60 degrees, therefore a line cannot just be deviated easily, and proper planning is required. For larger bends, special towers have to be constructed;

- Transmission line routes with existing access routes are preferred, as heavy vehicles and cranes are used for tower construction which needs to travel to the servitude area and specifically to tower positions; and
- When planning a route it is preferable to avoid construction on erosive land, land which is undermined where sinkholes occur or where sinkholes could occur in future, furthermore area with poor geotechnical conditions should be avoided as far as possible.

There are various other technical criteria which are considered during the route selection process of a proposed new powerline. A large scale detailed map which shows the proposed alternative routes and associated 1km study areas are attached to Appendix A.

### 1.4.2 Eastern Route Alternative

The Eastern route alternative is approximately 35km in length and runs between the existing Dinaledi Substation and the proposed new Anderson Substation. The eastern route alternative originates on Portion 25 of the Farm Welgedund 491 JQ which is located north of Pelindaba. Portion 25 of the Farm Welgedund 491 JQ is one of the properties which is earmarked for substation construction. From here the route runs in an eastern direction and traverse Portion 82 of the Farm Weldaba 567 JQ and Portion 17 of the Farm Schurveberg 488 JQ. On Portion 17 the route turns in a north eastern direction and traverse Portions 81 and 112 of the Farm Schurveberg 488 JQ. From here the route runs in an eastern direction and traverse Portions 113, 114, 108, 115 and 116 of the Farm Schurveberg 488 JQ.

On Portion 116 of the Farm Schurveberg the route turns in a north eastern direction, and runs in close proximity to the boundaries of Portions 75 and 76 of the Farm Elandsfontein 352 JR for approximately 60m before turning in a northern direction on Portion 76. From here the route traverses Portions 77, 145, and 146 of the Farm Elandsfontein 352 JR. On Portion 146 the route turns slightly in a north western direction and traverse Portions 142, 141, 143, 144, 145, and 78 of the Farm Uitzicht Alias Rietvalei 314 JR. From here the route continues in a slight north western direction and traverse Portions 65, 62, 270, and 268 of the Farm Kameeldrift 313 JR. From here the route turns further in a north western direction and traverse Portions 324 and 50 of the Farm Rietfontein 485 JQ. From here the route continues in a north western direction and traverse Portions 44 of the Farm Schietfontein 437 JQ and turns further in a north western direction where it traverses Portions 49 and 23 of the Farm Zilkaatsnek 439 JQ. On Portion 23 the route turns in a north eastern direction and runs back to Portion 44 of the Farm Schietfontein 437 JQ. From here the route runs in a slight north western direction in close proximity to the boundary of Portion 44 and traverse Portions 71, 73, 74, 91, 16, and 13 of the Farm Schietfontein 437 JQ. From here the route turns further in a north eastern direction and traverse Portion 15 of the Farm Elandsfontein 440 JQ.

On Portion 15 the route turns in a western direction and traverse Portions 58, 63, 59 and 61 of the Farm Elandsfontein 440 JQ. On Portion 61 the route turns in a north western direction and traverse Portions 18, and 19 of the Farm Elandsfontein 440 JQ. From here the route turns in a northern direction and traverse Portions 44, 47, and 55 of the Farm Elandsfontein 440 JQ. On Portion 55 of the Farm Elandsfontein 440 JQ (Portion 55 of the Farm Boekenhoutfontein 44-JQ) the route turns slight north east and runs in close proximity to the boundary of Portion 55. On the northern boundary of the Portion 55, the route turns in a north western direction and traverse Portions 855, 854, 853, 852, 851, 850, 849, 848, 847, 846, 845, 844 and 843 of the Farm Roodekopjes of Zwartkopjes 427 JQ. The route terminates on Portion 843 of the Farm Roodekopjes of Zwartkopjes 427 JQ where the Dinaledi Substation is located.

The Eastern Route Alternative traverses the Gauteng and North West Provinces and is located within the City of Tshwane and Madibeng Local Municipal areas. This route alternative traverses the North West Province, and Madibeng Local Municipal area for approximately 21.68km and the Gauteng Province and the City of Tshwane Local Municipal area for approximately 5.6km. A total of 59 properties are currently directly affected by this proposed route alternative.

The property of the Xsrata Eland Platinum Mine is located between the Eastern and Western route alternatives. During the Eskom route selection process, one deviation was made to the Eastern Route to accommodate the Eland Platinum Mine. Various deviations were made to the Western Route Alternative which is discussed in detail in Section 1.4.4 below. These deviations were created in order to avoid mining areas and to provide the mine with various options on how the route could traverse their property should the routes not interfere with already approved future mine expansions and to avoid traversing of surfaces earmarked for future open cast mining. The Eastern Route Deviation is discussed in detail in Section 1.4.2.1 below.

### 1.4.2.1 Eastern Route Alternative Deviation

The deviation to the eastern route originates on Portion 16 of the Farm Schietfontein 437 JQ where it turns from the original eastern route alternative in a north eastern direction, and then in a northern direction from where it traverses Portion 13 of the Farm Schietfontein 437 JQ. The route runs along the eastern boundary of Portion 13 for approximately 1.4km before it turns in a north western direction where it joins the original eastern route alternative on Portion 13.

The Eastern Route Alternative Deviation is located within the North West Province and the Madibeng Local Municipal area. A total of 2 properties are currently directly affected by this proposed route alternative.

### 1.4.3 Central Route Alternative

The Central Route Alternative originates on Portion 843 of the Farm Roodekopjes of Zwartkopjes 427 JQ where the Dinaledi Substation is located. From here it turns in a south western direction and traverses Portions 843, 844, 845, 846, 847, 848, 849, 850, 851, 853, 853, 854 and 855 of the Farm Roodekopjes of Zwartkopjes 427 JQ and Portion 17 of the Farm Elandsfontein 440 JQ. On Portion 17 the route turns in a south eastern direction and traverse Portions 18, 43, 46, 47 and 55 of the Farm Elandsfontein 440 JQ. On Portion 55 of the Farm Elandsfontein 440 JQ (Portion 55 of the Farm Boekenhoutfontein 44-JQ) the route joins the eastern route alternative.

The Central Route Alternative is located within the North West Province and the Madibeng Local Municipal area. A total of 19 properties are currently directly affected by this proposed route alternative.

### 1.4.4 Western Route Alternative

The Western Route Alternative is approximately 31km in length and originates at the same position as the eastern route alternative, on Portion 25 of the Farm Welgedund 491 JQ which one of the alternative properties earmarked for substation construction. The Western Route Alternative runs between the proposed new Anderson Substation which is earmarked for development north of Pelindaba and the existing Dinaledi Substation which is located approximately 8km north east of Brits.

The Western Route Alternative follows the Eastern Route Alternative for approximately 2.8km before it turns in a north eastern direction on Portion 82 of the Farm Weldaba 567 JQ, and traverse Portion 2 of the Farm Welgedund 491 JQ. On Portion 2, the route turns in a northern direction and run in close proximity to the boundaries of Portions 2, and 88 of the Farm Welgedund 491 JQ.

From here the route turns in a slight north eastern direction and traverse Portion 59 of the Farm Rietfontein 485 JQ. On Portion 59 the route turns in a northern direction and traverse Portions 236, 237 and 67 of the Farm Rietfontein 485 JQ. On the northern boundary of Portion 67, the route turns in a north western direction and traverse Portions 218 and 108 of the Farm Rietfontein 485 JQ. On Portion 108 the route turns in a northern direction and traverse Portions 111 and 70 of the Farm Rietfontein 485 JQ. On Portion 70 the route turns in a western direction and traverses Portions 71, 57, 28, 47, and 27 of the Farm Rietfontein 485 JQ, Portions 3 and the Remaining Extent of the Farm Uitval 484 JQ, and Portions 38, 37, 35, 34, 51 and 30 of the Farm Zilkaatsnek 439 JQ. On Portion 30 the route turns in a north western direction and traverses Portions 127, 29, 52, 53, 159, 160, 134 and 108 of the Farm Zilkaatsnek 439 JQ. On Portion 108 the route turns on a northern direction and runs in close proximity to the western boundary of Portion 108 from where it traverses Portion 14 of the Farm Zilkaatsnek 439 JQ.

From here the route traverses Portion 0 (or the Remaining Extent) of the Farm Elandsfontein 440 JQ. From here the route turns in a north eastern direction and traverses Portion 52 of the Farm Elandsfontein 440 JQ. From here the route continues in a north eastern direction and traverse Portions 707, 0, 626, 163, 164, 165, 166, 167, 168, 169, 568, 860, and 814 of the Farm Roodekopjes of Zwartkopjes 427 JQ. On Portion 814 the route turns into an eastern direction where it traverse Portion 843 of the Farm Roodekopjes of Zwartkopjes 427 JQ. The route terminates on Portion 843 of the Farm Roodekopjes of Zwartkopjes 427 JQ where the Dinaledi Substation is located.

The Western Route Alternative is located within the North West Province and the Madibeng Local Municipal area. A total of 49 properties are currently directly affected by this proposed route alternative.

As mentioned previously, the property of the Xsrata Eland Platinum Mine is located between the Eastern and Western route alternatives. During the Eskom route selection process, one deviation was made to the Eastern Route to accommodate the Eland Platinum Mine, and two of the three deviations to the Western Route alternative were made to accommodate the Eland Platinum Mine. These deviations were created in order to avoid mining areas and to provide the mine with various options on how the route could traverse their property should the routes not interfere with already approved future mine expansions and to avoid traversing of surfaces earmarked for future open cast mining. The third deviation made to the Western Alternative was created as this deviation follows existing roads and powerline infrastructure. The deviations to the Western Route Alternative are discussed below in Sections 1.4.4.1 to 1.4.4.3.

### 1.4.4.1 Western Route Alternative – Deviation 1 (Western Deviation)

This deviation originates on Portion 104 of the Farm Zilkaatsnek 439 JQ from where it links from the Western Route Alternative Deviation 3 (Southern Deviation). From the point of origin, the route runs in a north western direction and traverses Portions 93, 92, 91, 90, 105, 106, 107 and 85 of the Farm Hartebeesfontein 445 JQ.

From here the route traverses the suburb of Madibeng where it traverses Erf 2. From here the route traverses Portions 207, 60, 97, and 96 of the Farm Hartebeesfontein 445 JQ. On Portion 96 the route turns in an eastern direction and traverses Portion 137 of the Farm Hartebeesfontein 445 JQ. On Portion 137 the route turn in a north eastern direction and traverses Portions 101, 184, 176, 175, 174, 191, 100, and 46 of the Farm De Kroon 444 JQ. On Portion 46 the route turns in a north western direction and traverses Portions 231, 173, 52, 51, 122, and 121 of the Farm De Kroon 444 JQ, and Portion 81 of the Farm Elandsfontein 440 JQ. On the northern boundary of Portion 81 the route turn further in a north eastern direction and traverses Portions 2, 24, 10, 64 and 0 of the Farm Elandsfontein 440 JQ. This deviation terminates on Portion 0 of the Farm Elandsfontein 440 JQ where it joins the original Western Route Alternative.

The Western Route Alternative – Deviation 1 (Western Deviation) is located within the North West Province and the Madibeng Local Municipal area. A total of 35 properties are currently directly affected by this proposed route alternative.

### 1.4.4.2 Western Route Alternative – Deviation 2 (Eastern Deviation)

This deviation originates on Portion 14 of the Farm Zilkaatsnek 439 JQ where it links from the original Western Route Alternative. From here the route runs in an eastern direction and traverses a very small section of Portion 0 (or Remaining Extent) of the Farm Elandsfontein 440 JQ. On Portion 0 the route turns back to traverse Portion 14 of the Farm Zilkaatsnek 439 JQ and continues in an eastern direction to traverse Portions 113, 86, 88, 89, 87, 80 and 98 of the Farm Zilkaatsnek 439 JQ. On Portion 98 the route turns in a north eastern direction where it intersects with the original Eastern Route alignment on Portion 13 of the Farm Schietfontein 437 JQ and where it joins the Eastern Route Deviation on Portion 13 of the Farm Schietfontein 347 JQ.

The Western Route Alternative – Deviation 2 (Eastern Deviation) is located within the North West Province and the Madibeng Local Municipal area. A total of 11 properties are currently directly affected by this proposed route alternative.

### 1.4.4.3 Western Route Alternative – Deviation 3 (Southern Deviation)

This deviation originates on Portion 70 of the Farm Rietfontein 485 JQ where it links from the original Western Route Alternative. From here the route turns in a western direction and traverse Portions 71, 186, 185, 28, 47, and 27 of the Farm Rietfontein 485 JQ and Portions 3 and Portion 0 (Remaining Extent) of the Farm Uitval 484 JQ. From here the route traverses Portions 2, 127 and 105 of the Farm Zilkaatsnek 439 JQ. On Portion 105 the route turns in a north western direction and runs in close proximity to the boundary of Portion 104 of the Farm Zilkaatsnek 439 JQ.

On Portion 104 the route turns in a northern direction where it intersects with the original Western Route Alternative on Portion 108 of the Farm Zilkaatsnek 439 JQ. The route then turns in a north eastern direction where it joins the original Western Route Alternative on Portion 108 of the Farm Zilkaatsnekl 439 JQ.

The Western Route Alternative – Deviation 3 (Southern Deviation) is located within the North West Province and the Madibeng Local Municipal area. A total of 14 properties are currently directly affected by this proposed route alternative.

## 1.5 Properties Affected by 1km Study Area

A list of all properties located within the 1km study area of the three alternative proposed Powerline Routes is provide in the table below. This table also includes all the directly affected properties. The Cadastral 2006 information was used to determine the affected properties. Therefore all subdivisions undertaken after 2006 will not be reflected on this list.

**Table 1: List of All Affected Properties**

<b>Proposed Anderson-Dinaledi 400kV Powerline - Affected Property Details</b>			
<b>21 Digit Surveyor General Code based on the Cadastre 2006 Information</b>			
B0JQ000000004260000	T0JQ0000000043900159	T0JQ0000000044500105	T0JQ0000000048800061
B0JQ0000000043700030	T0JQ0000000043900160	T0JQ0000000044500106	T0JQ0000000048800062
B0JQ0000000044000055	T0JQ0000000043900161	T0JQ0000000044500107	T0JQ0000000048800062
B0JQ0000000044000057	T0JQ0000000043900162	T0JQ0000000044500110	T0JQ0000000048800063
B0JQ0000000044000058	T0JQ0000000043900163	T0JQ0000000044500112	T0JQ0000000048800063
T0JQ0000000042500054	T0JQ0000000043900164	T0JQ0000000044500118	T0JQ0000000048800064
T0JQ0000000042700163	T0JQ0000000043900166	T0JQ0000000044500121	T0JQ0000000048800064
T0JQ0000000042700164	T0JQ0000000043900168	T0JQ0000000044500123	T0JQ0000000048800065
T0JQ0000000042700165	T0JQ0000000043900169	T0JQ0000000044500124	T0JQ0000000048800065
T0JQ0000000042700166	T0JQ0000000044000002	T0JQ0000000044500125	T0JQ0000000048800076
T0JQ0000000042700167	T0JQ0000000044000009	T0JQ0000000044500137	T0JQ0000000048800081
T0JQ0000000042700168	T0JQ0000000044000010	T0JQ0000000044500138	T0JQ0000000048800082
T0JQ0000000042700169	T0JQ0000000044000015	T0JQ0000000044500145	T0JQ0000000048800083
T0JQ0000000042700490	T0JQ0000000044000016	T0JQ0000000044500146	T0JQ0000000048800090
T0JQ0000000042700568	T0JQ0000000044000017	T0JQ0000000044500147	T0JQ0000000048800090
T0JQ0000000042700626	T0JQ0000000044000018	T0JQ0000000044500178	T0JQ0000000048800095
T0JQ0000000042700627	T0JQ0000000044000019	T0JQ0000000044500186	T0JQ0000000048800095
T0JQ0000000042700707	T0JQ0000000044000024	T0JQ0000000044500188	T0JQ0000000048800096
T0JQ0000000042700813	T0JQ0000000044000029	T0JQ0000000044500207	T0JQ0000000048800096
T0JQ0000000042700814	T0JQ0000000044000030	T0JQ0000000044500210	T0JQ0000000048800097
T0JQ0000000042700831	T0JQ0000000044000038	T0JQ0000000044500211	T0JQ0000000048800098
T0JQ0000000042700841	T0JQ0000000044000039	T0JQ0000000048400000	T0JQ0000000048800108
T0JQ0000000042700842	T0JQ0000000044000040	T0JQ0000000048400002	T0JQ0000000048800109
T0JQ0000000042700843	T0JQ0000000044000043	T0JQ0000000048400003	T0JQ0000000048800110
T0JQ0000000042700844	T0JQ0000000044000044	T0JQ0000000048500004	T0JQ0000000048800111
T0JQ0000000042700845	T0JQ0000000044000045	T0JQ0000000048500004	T0JQ0000000048800112
T0JQ0000000042700846	T0JQ0000000044000046	T0JQ0000000048500007	T0JQ0000000048800113
T0JQ0000000042700847	T0JQ0000000044000047	T0JQ0000000048500027	T0JQ0000000048800114
T0JQ0000000042700848	T0JQ0000000044000052	T0JQ0000000048500028	T0JQ0000000048800115
T0JQ0000000042700849	T0JQ0000000044000056	T0JQ0000000048500033	T0JQ0000000048800116
T0JQ0000000042700850	T0JQ0000000044000058	T0JQ0000000048500044	T0JQ0000000048800117
T0JQ0000000042700851	T0JQ0000000044000059	T0JQ0000000048500044	T0JQ0000000049100002
T0JQ0000000042700852	T0JQ0000000044000060	T0JQ0000000048500045	T0JQ0000000049100002
T0JQ0000000042700853	T0JQ0000000044000061	T0JQ0000000048500046	T0JQ0000000049100025
T0JQ0000000042700854	T0JQ0000000044000063	T0JQ0000000048500047	T0JQ0000000049100053
T0JQ0000000042700855	T0JQ0000000044000064	T0JQ0000000048500050	T0JQ0000000049100054



<b>Proposed Anderson-Dinaledi 400kV Powerline - Affected Property Details</b>			
<b>21 Digit Surveyor General Code based on the Cadastre 2006 Information</b>			
T0JQ0000000042700860	T0JQ0000000044000078	T0JQ0000000048500051	T0JQ0000000049100055
T0JQ0000000043700013	T0JQ0000000044000080	T0JQ0000000048500057	T0JQ0000000049100056
T0JQ0000000043700014	T0JQ0000000044000081	T0JQ0000000048500058	T0JQ0000000049100057
T0JQ0000000043700016	T0JQ0000000044000082	T0JQ0000000048500058	T0JQ0000000049100058
T0JQ0000000043700044	T0JQ0000000044000084	T0JQ0000000048500059	T0JQ0000000049100059
T0JQ0000000043700065	T0JQ0000000044000086	T0JQ0000000048500059	T0JQ0000000049100060
T0JQ0000000043700066	T0JQ0000000044000087	T0JQ0000000048500061	T0JQ0000000049100061
T0JQ0000000043700067	T0JQ0000000044000088	T0JQ0000000048500067	T0JQ0000000049100065
T0JQ0000000043700068	T0JQ0000000044000089	T0JQ0000000048500068	T0JQ0000000049100088
T0JQ0000000043700069	T0JQ0000000044100000	T0JQ0000000048500070	T0JQ0000000049100088
T0JQ0000000043700070	T0JQ0000000044400045	T0JQ0000000048500071	T0JQ0000000056700082
T0JQ0000000043700071	T0JQ0000000044400046	T0JQ0000000048500102	T0JQ0000000056700082
T0JQ0000000043700072	T0JQ0000000044400047	T0JQ0000000048500107	T0JQ00010000000100000
T0JQ0000000043700073	T0JQ0000000044400048	T0JQ0000000048500108	T0JQ00010000000200000
T0JQ0000000043700074	T0JQ0000000044400049	T0JQ0000000048500109	T0JQ00010000000300000
T0JQ0000000043700076	T0JQ0000000044400050	T0JQ0000000048500110	T0JQ00010000000400000
T0JQ0000000043700077	T0JQ0000000044400051	T0JQ0000000048500111	T0JQ00010000000500000
T0JQ0000000043700078	T0JQ0000000044400052	T0JQ0000000048500112	T0JQ00010000000600000
T0JQ0000000043700090	T0JQ0000000044400058	T0JQ0000000048500117	T0JQ00010000000700000
T0JQ0000000043700091	T0JQ0000000044400078	T0JQ0000000048500119	T0JQ00010000000800000
T0JQ0000000043900000	T0JQ0000000044400097	T0JQ0000000048500120	T0JQ00010000000900000
T0JQ0000000043900002	T0JQ0000000044400099	T0JQ0000000048500121	T0JQ00010000001000000
T0JQ0000000043900003	T0JQ0000000044400100	T0JQ0000000048500122	T0JQ000500000044100000
T0JQ0000000043900007	T0JQ0000000044400101	T0JQ0000000048500123	T0JQ000500000044200000
T0JQ0000000043900014	T0JQ0000000044400104	T0JQ0000000048500124	T0JQ000500000044300000
T0JQ0000000043900019	T0JQ0000000044400105	T0JQ0000000048500131	T0JR00000000031300000
T0JQ0000000043900023	T0JQ0000000044400115	T0JQ0000000048500132	T0JR00000000031300007
T0JQ0000000043900024	T0JQ0000000044400119	T0JQ0000000048500138	T0JR00000000031300010
T0JQ0000000043900025	T0JQ0000000044400120	T0JQ0000000048500141	T0JR00000000031300047
T0JQ0000000043900027	T0JQ0000000044400121	T0JQ0000000048500147	T0JR00000000031300048
T0JQ0000000043900028	T0JQ0000000044400122	T0JQ0000000048500150	T0JR00000000031300052
T0JQ0000000043900029	T0JQ0000000044400123	T0JQ0000000048500157	T0JR00000000031300062
T0JQ0000000043900030	T0JQ0000000044400135	T0JQ0000000048500160	T0JR00000000031300065
T0JQ0000000043900034	T0JQ0000000044400137	T0JQ0000000048500160	T0JR00000000031300074
T0JQ0000000043900035	T0JQ0000000044400142	T0JQ0000000048500164	T0JR00000000031300076
T0JQ0000000043900037	T0JQ0000000044400157	T0JQ0000000048500165	T0JR00000000031300077
T0JQ0000000043900038	T0JQ0000000044400159	T0JQ0000000048500168	T0JR00000000031300134
T0JQ0000000043900041	T0JQ0000000044400160	T0JQ0000000048500169	T0JR00000000031300135
T0JQ0000000043900042	T0JQ0000000044400161	T0JQ0000000048500174	T0JR00000000031300136
T0JQ0000000043900046	T0JQ0000000044400165	T0JQ0000000048500184	T0JR00000000031300209
T0JQ0000000043900047	T0JQ0000000044400166	T0JQ0000000048500185	T0JR00000000031300210
T0JQ0000000043900048	T0JQ0000000044400167	T0JQ0000000048500186	T0JR00000000031300251
T0JQ0000000043900049	T0JQ0000000044400168	T0JQ0000000048500192	T0JR00000000031300256
T0JQ0000000043900051	T0JQ0000000044400172	T0JQ0000000048500193	T0JR00000000031300267
T0JQ0000000043900052	T0JQ0000000044400173	T0JQ0000000048500193	T0JR00000000031300268
T0JQ0000000043900053	T0JQ0000000044400174	T0JQ0000000048500201	T0JR00000000031300269
T0JQ0000000043900055	T0JQ0000000044400175	T0JQ0000000048500206	T0JR00000000031300270
T0JQ0000000043900072	T0JQ0000000044400176	T0JQ0000000048500209	T0JR00000000031300271

<b>Proposed Anderson-Dinaledi 400kV Powerline - Affected Property Details</b>			
<b>21 Digit Surveyor General Code based on the Cadastre 2006 Information</b>			
T0JQ000000004390073	T0JQ0000000044400177	T0JQ0000000048500210	T0JR0000000031300273
T0JQ000000004390078	T0JQ0000000044400180	T0JQ0000000048500211	T0JR0000000031300280
T0JQ000000004390079	T0JQ0000000044400181	T0JQ0000000048500214	T0JR0000000031300320
T0JQ000000004390080	T0JQ0000000044400184	T0JQ0000000048500218	T0JR0000000031300321
T0JQ000000004390081	T0JQ0000000044400186	T0JQ0000000048500219	T0JR0000000031300322
T0JQ000000004390082	T0JQ0000000044400191	T0JQ0000000048500220	T0JR0000000031300323
T0JQ000000004390083	T0JQ0000000044400202	T0JQ0000000048500222	T0JR0000000031300324
T0JQ000000004390084	T0JQ0000000044400211	T0JQ0000000048500222	T0JR0000000031300325
T0JQ000000004390086	T0JQ0000000044400215	T0JQ0000000048500236	T0JR0000000031300326
T0JQ000000004390087	T0JQ0000000044400231	T0JQ0000000048500237	T0JR0000000031300340
T0JQ000000004390088	T0JQ0000000044400232	T0JQ0000000048500238	T0JR0000000031300341
T0JQ000000004390089	T0JQ0000000044400257	T0JQ0000000048500239	T0JR0000000031300348
T0JQ000000004390090	T0JQ0000000044500000	T0JQ0000000048500240	T0JR0000000031300349
T0JQ000000004390095	T0JQ0000000044500016	T0JQ0000000048500253	T0JR0000000031400009
T0JQ000000004390096	T0JQ0000000044500020	T0JQ0000000048500274	T0JR0000000031400010
T0JQ000000004390097	T0JQ0000000044500021	T0JQ0000000048500275	T0JR0000000031400051
T0JQ000000004390098	T0JQ0000000044500022	T0JQ0000000048500276	T0JR0000000031400078
T0JQ000000004390099	T0JQ0000000044500047	T0JQ0000000048500277	T0JR0000000031400141
T0JQ000000004390100	T0JQ0000000044500055	T0JQ0000000048500278	T0JR0000000031400142
T0JQ000000004390101	T0JQ0000000044500057	T0JQ0000000048500279	T0JR0000000031400143
T0JQ000000004390102	T0JQ0000000044500058	T0JQ0000000048500280	T0JR0000000031400144
T0JQ000000004390103	T0JQ0000000044500059	T0JQ0000000048500281	T0JR0000000031400145
T0JQ000000004390104	T0JQ0000000044500060	T0JQ0000000048500282	T0JR0000000035200054
T0JQ000000004390105	T0JQ0000000044500085	T0JQ0000000048500283	T0JR0000000035200055
T0JQ000000004390106	T0JQ0000000044500086	T0JQ0000000048500284	T0JR0000000035200061
T0JQ000000004390107	T0JQ0000000044500087	T0JQ0000000048500285	T0JR0000000035200062
T0JQ000000004390108	T0JQ0000000044500088	T0JQ0000000048500286	T0JR0000000035200071
T0JQ000000004390113	T0JQ0000000044500090	T0JQ0000000048500297	T0JR0000000035200072
T0JQ000000004390126	T0JQ0000000044500091	T0JQ0000000048500298	T0JR0000000035200073
T0JQ000000004390127	T0JQ0000000044500092	T0JQ0000000048500324	T0JR0000000035200074
T0JQ000000004390134	T0JQ0000000044500093	T0JQ0000000048800015	T0JR0000000035200075
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T0JQ000000004390136	T0JQ0000000044500095	T0JQ0000000048800016	T0JR0000000035200077
T0JQ000000004390137	T0JQ0000000044500096	T0JQ0000000048800017	T0JR0000000035200144
T0JQ000000004390155	T0JQ0000000044500097	T0JQ0000000048800017	T0JR0000000035200145
T0JQ000000004390156	T0JQ0000000044500102	T0JQ0000000048800055	T0JR0000000035200146
T0JQ000000004390157	T0JQ0000000044500103	T0JQ0000000048800059	
T0JQ000000004390158	T0JQ0000000044500104	T0JQ0000000048800060	

## 1.6 Upgrade of the Existing 88kV Line

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The proposed Madibeng substation project which is undertaken by Eskom Distribution forms part of the Tshwane Strengthening Scheme. This project entails the construction of a proposed Madibeng Substation which will be located at about 8km south-west of the Dinaledi Substation. The Madibeng Substation will be fed from Dinaledi MTS through 2x132kV lines and thereby split the existing 88kV network in the Tshwane and Brits area. The existing 88kV network in and around the Brits and Tshwane area will be split in such a way that an existing 88kV Lomond-De Wildt line becomes redundant. The Lomond-De Wildt line route is located within the Anderson-Dinaledi 400kV line study area and thus it can be decommissioned after the construction of the Madibeng Substation in order to accommodate the proposed Anderson-Dinaledi 400kV line.

The Madibeng substation project is scheduled to be commissioned by 2014 depending on the speed acquisition of servitudes. The current 88kV Lomond-De Wildt line route servitude is designed for 88kV lines and therefore becomes inadequate for a 400kV line route. The majority of the existing line towers are wood poles which were designed for 88kV lines in terms of clearances and insulations. It is thus necessary that the servitude be extended and the towers be re-designed or changed for the 400kV line. The foundation of the towers will most probably change as the centre line servitude may change due to the servitude extension and different towers.

The centre line will change because the existing line runs closer to another existing 88kV line. It is therefore worth noting that the decommissioning and dismantling of the existing 88kV Lomond-De Wildt line for the proposed 400kV Anderson-Dinaledi line can only begin when Madibeng substation is successfully commissioned.

## 2 ENVIRONMENTAL ASSESSMENT PRACTITIONER

Nemai Consulting was appointed by Eskom Holdings Limited as the independent Environmental Assessment Practitioner (EAP) to undertake the environmental authorisation process (described in Section 4 below) for the proposed establishment of the Anderson-Dinaledi 400kV Powerline.

In accordance with Regulation 29(2) of Government Notice No. R. 385 of 21 April 2006, this section provides an overview of Nemai Consulting and the company's experience with Environmental Impact Assessments (EIA's), as well as the details and experience of the Environmental Assessment Practitioners (EAP's) that form part of the Scoping and EIA team.

Nemai Consulting is an independent, specialist environmental, social development and Occupational Health and Safety (OHS) consultancy, which was founded in December 1999. The company is directed by a team of experienced and capable environmental engineers, scientists, ecologists, sociologists, economists and analysts. The company has offices in Randburg (Gauteng), Rustenburg (North West Province), and Durban (KwaZulu Natal).

The members of Nemai Consulting that are involved with the Scoping and EIA process for the proposed project are captured in Table 2 below, and their respective Curricula Vitae are attached as Appendix B.

**Table 2: Scoping and EIA Team Members**

Name	Duties
Ms D. Naidoo	Project Director
Ms S van Eden	<ul style="list-style-type: none"><li>• Nemai Project Manager</li><li>• Compiling Scoping and EIA Reports</li></ul>
Mr D. Henning	Quality Reviewer

### 3 LEGISLATION AND GUIDELINES CONSIDERED

Please note this project will be undertaken in terms of the Environmental Impact Assessment (EIA) Regulations of 2006, as the Application Form for undertaking the Environmental Authorisation Phase for this project was submitted to the Department of Environmental Affairs (DEA) on the 29<sup>th</sup> of July 2009. However, the new EIA Regulations which was promulgated on the 18<sup>th</sup> of June 2010 and which came into effect on the 2<sup>nd</sup> of August 2010 will be considered as part of the Scoping and EIA Phases in order to ensure that listed activities under the new EIA Regulations are considered, assessed and addressed. The EIA Regulation of 2006 and of 2010 as well as the relevant listed activities which will be triggered as part of this proposed project is addressed in Section 3.1 below.

### 3.1 National Environmental Management Act

The purpose of this Act is to provide for co-operative, environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state; and to provide for matters connected therewith.

#### 3.1.1 Environmental Impact Assessment Regulations, 2006

The Environmental Impact Assessment (EIA) Regulations, 2006, promulgated in terms of Section 24(5) of the National Environmental Management Act ([NEMA], Act 107 of 1998) are divided into two Schedules, R 386 and R 387. R 386 defines activities which will trigger the need for a Basic Assessment and R 387 defines activities which trigger an Environmental Impact Assessment (EIA) process. If activities from both schedules are triggered, then an EIA process will be required.

In order to determine which Environmental Authorisation Process will be required for the proposed project, the EIA Regulations, 2006 was consulted. During the project application phase, the activities as tabled below were identified as activities which could potentially be triggered by the proposed development. Activities were broadly selected, and therefore some of the activities identified will no longer be applicable. The activities which will not longer be applicable have been shaded in grey.

**Table 3: EIA Regulations 2006, List of Activities Triggered**

Relevant Government Notice	Activity	Description	Applicability to Project
R. 387 of 21 April 2006	1(l)	The construction of facilities or infrastructure, including associated structures or infrastructure, for – The transmission and distribution of above ground electricity with a capacity of 120 kilovolts or more.	The project involves the construction of a 400kV Transmission Line
R. 387 of 21 April 2006	2	Any development activity, including associated structures and infrastructure, where the total area of the developed area is, or is intended to be, 20 hectares or more.	This activity was considered as construction of a powerline will occur within a 55m wide servitude over a distance of approximately 40km. Therefore the total project area will be approximately 220ha

Relevant Government Notice	Activity	Description	Applicability to Project
			in extent. However, this activity is not applicable for linear developments and is therefore excluded as a listed activity.
<b>R. 387 of 21 April 2006</b>	<b>5</b>	<p>The route determination of roads and design of associated physical infrastructure, including roads that have not yet been built for which routes have been determined before the publication of this notice and which has not been authorised by a competent authority in terms of the Environmental Impact Assessment Regulations, 2006 made under section 24(5) of the Act and published in Government Notice No. R.385 of 2006, where –</p> <p>(a) It is a national road as defined in section 40 of the South African National Roads Agency Limited and National Roads Act, 1998 (Act No.7 of 1998);</p> <p>(b) it is a road administered by a provincial authority;</p> <p>(c) the road reserve is wider than 30 meters; or</p> <p>(d) the road will cater for more than one lane of traffic in both directions.</p>	<p>This activity will not be applicable as only single lane access and maintenance roads will be required for this proposed project. The proposed maintenance roads will be gravel roads which will be located within the 55m servitude. Access roads will most likely also be single lane gravel roads.</p>
<b>R. 386 of 21 April 2006</b>	<b>1 (m)</b>	<p>The construction of facilities or infrastructure, including associated structures or infrastructure, for –</p> <p>any purpose in the one in ten year flood line of a river or stream, or within 32 metres from the bank of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use, but including -</p> <p>(i) canals;</p> <p>(ii) channels;</p> <p>(iii) bridges;</p> <p>(iv) dams; and</p> <p>(v) weirs.</p>	<p>A one kilometre study corridor for the construction of the 400kV powerline will be considered as part of this project. Once a corridor has been approved by DEA, a walk down survey will be undertaken by all the relevant specialists to determine where the actual centre line (powerline) will be located within the corridor. It is therefore not yet known whether it would be necessary to construct pylons within the 32m of the bank of rivers or streams, or whether it will be possible to span across.</p>
<b>R. 386 of 21 April 2006</b>	<b>1(p)</b>	<p>The construction of facilities or infrastructure, including associated structures or infrastructure for the temporary storage of hazardous waste.</p>	<p>During the construction phase above ground temporary diesel storage tanks may be required at</p>

Relevant Government Notice	Activity	Description	Applicability to Project
			the construction camps, as well as a temporary grease/chemical store.
<b>R. 386 of 21 April 2006</b>	<b>7</b>	The above ground storage of a dangerous good, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 cubic metres but less than 1 000 cubic metres at any one location or site.	Diesel storage tanks may be erected at the construction camps during the construction phase. The size of these tanks is not known.
<b>R. 386 of 21 April 2006</b>	<b>12</b>	The transformation or removal of indigenous vegetation of 3 hectares or more or of any size where the transformation or removal would occur within a critically endangered or an endangered ecosystem listed in terms of section 52 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).	It is not yet clear exactly where the proposed powerline will be located as a full 1km study area and alternative routes will be considered for this proposed project. This activity has therefore been included. Authorities have indicated in the past that this activity is not applicable for linear projects, however, should transformation of vegetation occur within the proposed 55m servitude over a long distance within a sensitive area, then this activity may be triggered.
<b>R. 386 of 21 April 2006</b>	<b>15</b>	The construction of a road that is wider than 4 metres or that has a reserve wider than 6 metres, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30 metres long.	Maintenance roads will be required in order for Eskom to access the powerlines for maintenance purposes. Details on the maintenance roads are not yet known as the exact powerline location is not yet known. It is not anticipated that any of these maintenance roads will be wider than 4m.
<b>R. 386 of 21 April 2006</b>	<b>20</b>	The transformation of an area zoned for use as public open space or for a conservation purpose to another use.	It is not yet clear exactly where the proposed powerline will be located as a full 1km study area and alternatives will be considered for this proposed project. This activity have therefore been included as it is not yet known

Relevant Government Notice	Activity	Description	Applicability to Project
			exactly what types of land uses will be affected by the powerline servitude.

In terms of the EIA Regulations of 2006, the establishment of the proposed 400kV powerline will trigger activities from both R 386 and R 387, and therefore the establishment of the proposed powerline is subject to a Scoping and Environmental Impact Assessment Process. The Scoping and EIA phases are detailed below in Section 4.

### 3.1.2 Environmental Impact Assessment Regulations, 2010

The Environmental Impact Assessment (EIA) Regulations, 2010, promulgated in terms of Section 24(5) of the National Environmental Management Act ([NEMA], Act 107 of 1998) are divided into three Schedules, R 544, R 545 and R 546. Schedule R544 defines activities which will trigger the need for a Basic Assessment and R 545 defines activities which trigger an Environmental Impact Assessment (EIA) process. If activities from both schedules are triggered, then an EIA process will be required. Regulation 546 defines certain additional listed activities per province for which a Basic Assessment would be required.

Listed activities from these Regulations which will be triggered as part of the proposed powerline project are provided in the table below.

**Table 4: EIA Regulations 2010, List of Activities Triggered**

Relevant Government Notice	Activity	Description	Applicability to Project
<b>R. 544 of 18 June 2010</b>	<b>11</b>	The construction of: (i) canals; (ii) channels; (iii) bridges; (iv) dams; (v) weirs; (vi) bulk storm water outlet structures; (vii) marinas; (viii) jetties exceeding 50 square metres in size; (ix) slipways exceeding 50 square metres in size; (x) buildings exceeding 50 square metres in	A one kilometre study corridor for the construction of the 400kV powerline will be considered as part of this project. Once a corridor has been approved by DEA, a walk down survey will be undertaken by all the relevant specialists to determine where the actual centre line (powerline) will be located within the corridor. It is therefore not yet known whether it



Relevant Government Notice	Activity	Description	Applicability to Project
		<p>size; or</p> <p>(xi) infrastructure or structures covering 50 square metres or more</p> <p>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p>	would be necessary to construct pylons within the 32m of the bank of rivers or streams, or whether it will be possible to span across.
R. 544 of 18 June 2010	13	The construction of facilities or infrastructure for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 but not exceeding 500 cubic metres;	Diesel storage tanks may be erected at the construction camps during the construction phase. The size of these tanks is not known.
R. 544 of 18 June 2010	22	The construction of a road, outside urban areas, (i) with a reserve wider than 13,5 meters or, (ii) where no reserve exists where the road is wider than 8 metres, or for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010.	Maintenance roads will be required in order for Eskom to access the powerlines for maintenance purposes. Details on the maintenance roads are not yet known as the exact powerline location is not yet known. It is not anticipated that any of these maintenance roads will be wider than 4m.
R. 545 of 18 June 2010	8	The construction of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.	The project involves the construction of a 400kV Transmission Line
R. 546 of 18 June 2010	4	The construction of a road wider than 4 metres with a reserve less than 13,5 metres <b>(b) In Gauteng:</b> i. A protected area identified in terms of NEMPAA, excluding conservancies; ii. National Protected Area Expansion Strategy Focus areas;	Access and construction / maintenance roads will be required in order for Eskom to access the servitude and powerline for construction and maintenance purposes. A section of the proposed powerline will traverse the Magaliesberg Natural

Relevant Government Notice	Activity	Description	Applicability to Project
		<p>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;</p> <p>iv. Sites identified in terms of the Ramsar Convention;</p> <p>v. Sites identified as irreplaceable or important in the Gauteng Conservation plan;</p> <p>vi. Areas larger than 2 hectares zoned for use as public open space;</p> <p>vii. Areas zoned for a conservation purpose.</p> <p>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);</p> <p>Any site identified as land with high agricultural potential located within the Agricultural Hubs or Important Agricultural Sites identified in terms of the Gauteng Agricultural Potential Atlas, 2006.</p> <p><b>(c) In North West :</b></p> <p>i. Outside urban areas, in:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) Sensitive areas as identified in</p>	Protected Environment (MPNE).

Relevant Government Notice	Activity	Description	Applicability to Project
		<p>an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(dd) Sites or areas identified in terms of an International Convention;</p> <p>(ee) Critical biodiversity areas (Terrestrial Type 1 and 2 and Aquatic Type 1) as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(ff) Core areas in biosphere reserves;</p> <p>(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from a biosphere reserve.</p> <p>ii. In urban areas:</p> <p>(aa) Areas zoned for use as public open space;</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;</p> <p>(cc) Natural heritage sites.</p>	
R. 546 of 18 June 2010	12	The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes	Vegetation clearing within the servitude may be required. The extent of vegetation clearance is

Relevant Government Notice	Activity	Description	Applicability to Project
		<p>indigenous vegetation.</p> <p>(a) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p>(b) Within critical biodiversity areas identified in bioregional plans;</p> <p>(c) Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas.</p>	not yet known.
R. 546 of 18 June 2010	13	<p>The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for:</p> <p>1) 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.</p> <p>2) The undertaking of a linear activity falling below the thresholds mentioned in Listing Notice 1 in terms of GN No522 of 2010</p> <p>(a) Critical biodiversity areas and ecological support areas as identified in systematic biodiversity plans adopted by the competent authority.</p>	Vegetation clearing within the servitude may be required. The extent of vegetation clearance is not yet known.

Relevant Government Notice	Activity	Description	Applicability to Project
		<p>(b) National Protected Area Expansion Strategy Focus areas.</p> <p>(d) <b>In Gauteng:</b></p> <ul style="list-style-type: none"> <li>i. A protected area identified in terms of NEMPAA, excluding conservancies;</li> <li>ii. National Protected Area Expansion Strategy Focus areas;</li> <li>iii. Any declared protected area including Municipal or Provincial Nature Reserves as contemplated by the Environment Conservation Act, 1989 (Act No. 73 of 1989), the Nature Conservation Ordinance (Ordinance 12 of 1983); (v) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</li> <li>iv. Sites or areas identified in terms of an International Convention;</li> <li>v. Sites identified as irreplaceable or important in the Gauteng Conservation Plan.</li> </ul> <p>(e) <b>In North West:</b></p> <ul style="list-style-type: none"> <li>i. Outside urban areas, in: <ul style="list-style-type: none"> <li>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</li> <li>(bb) National Protected Area Expansion Strategy Focus areas;</li> <li>(cc) Sensitive areas as identified in</li> </ul> </li> </ul>	

Relevant Government Notice	Activity	Description	Applicability to Project
		<p>an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(dd) Sites or areas identified in terms of an International Convention;</p> <p>(ee) Critical biodiversity areas (Type 1 only) and ecological support areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(ff) Core areas in biosphere reserves;</p> <p>(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve.</p> <p>ii. In urban areas:</p> <p>(aa) Areas zoned for use as public open space;</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose;</p> <p>(cc) Natural heritage sites.</p>	

In terms of the EIA Regulations of 2010, a Scoping and Environmental Impact Assessment Process is required for the proposed powerline.

### **3.2 Environment Conservation Act (Act 73 of 1989)**

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The purpose of this Act is to provide for the effective protection and controlled utilisation of the environment and for matters incidental thereto. The following relevant Sections of this Act are relevant:

- Sections 2-3 (Part I): Policy for Environmental Conservation;
- Sections 16-18 (Part III): Protection of Natural Environment;
- Sections 19-20 (Part IV): Control of Environmental Pollution; and
- Section 21-23 (Part V): Control of Activities which may have a Detrimental Effect on the Environment

Section 16 – 18 of this Act (Part III): Protection of the Natural Environment is important for consideration as a section of the proposed powerline traverses the Magaliesberg Protected Natural Environment (MPNE).

### **3.3 National Environmental Management: Biodiversity Act (Act 10 of 2004)**

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The National Environmental Management: Biodiversity Act (NEMBA) provides for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; and provides for and includes:

- The protection of species and ecosystems that warrant national protection;
- The sustainable use of indigenous biological resources;
- The fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources;
- The establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith.

### **3.4 National Environmental Management: Protected Areas Act (Act 57 of 2003)**

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Where any construction activities or upgrading activities may impact on protected areas cognisance must be taken of the requirements as outlined in the NEMA: Protected Areas Act (Act 57, 2003).

### **3.5 The National Veld and Forest Act (Act 101 of 1998)**

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Section 12 of this Act renders firebreaks compulsory to landowners from whose land a veldfire may start, burn or spread. If it is determined that any land acquired for the purpose of constructing the switching station may start, burn or spread a veldfire then it would be compulsory for Eskom to implement firebreaks.

### **3.6 National Forest Act**

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In terms of The National Forests Act (Act 84, 1998), trees in natural forests or protected tree species (as listed in Government Gazette Notice 1012 of 27 August 2004) may not be cut, disturbed, damaged, destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold - except under licence granted by the Department of Agriculture, Forestry and Fisheries.

### **3.7 The Gauteng Ridges Guideline Policy**

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The Gauteng Ridges Guideline Policy was developed by the Gauteng Department of Agriculture and Rural Development for the protection of Ridges within the Province. In terms of this policy, Ridges have been divided into four (4) classes. A Class 1 Ridge is as a pristine ridge of which only 0-5% of the ridge has been transformed. Parts of the Magaliesberg are classified as a Class 1 Ridge. A Class 2 Ridge is a ridge on which 5-35% transformation occurred, and parts of the Magaliesberg are classified as a Class 2 Ridge. A Class Ridge is a ridge on which 35-65% of transformation occurred, and a Class 4 Ridge which has been transformed between 65-100%.

### **3.8 Environmental Management Framework and Plan for the Magaliesberg Protected Environment, 2007**

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The Environmental Management Framework and Plan for the Magaliesberg Protected Environment is aimed at addressing the requirements of an Environmental Management Framework as contemplated in Section 71 of the Environmental Impact Assessment Regulations of Government Notice R385 (21 April 2006), as well as the basic components of a Management Plan for a protected area as described in Section 41 of the National Environmental Management: Protected Areas Act (Act 57 of 2003).



This Environmental Management Framework and Plan will be utilised during the Environmental Impact Assessment Phase to ensure that construction and operational activities undertaken for the proposed powerline is in line with this Framework and Plan.

### 3.9 National Heritage Resources Act

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In terms of Section 38 of the Heritage Resources Act (Act No 25 of 1999), a Heritage Impact Assessment has to be undertaken for the following developments:

- Any development or other activity which will change the character of a site
  - Exceeding 5 000 m<sup>2</sup> in extent; or
  - Involving three or more existing erven or subdivisions thereof; or
  - Involving three or more erven or divisions thereof which have been consolidated within the past five years; or
  - The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
- The re-zoning of a site exceeding 10 000 m<sup>2</sup> in extent; or
- Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

### 3.10 National Water Act

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The National Water Act ([NWA] Act 36, 1998) identifies 11 consumptive and non-consumptive water uses which must be authorised under a tiered authorisation system. Section 27 of the NWA specifies that the following factors regarding water use authorisation must be taken into consideration:

- The efficient and beneficial use of water in the public interest;
- The socio-economic impact of the decision whether or not to issue a licence;
- Alignment with the catchment management strategy;
- The impact of the water use, resource directed measures; and
- Investments made by the applicant in respect of the water use in question.

Section 21 of the National Water Act identifies listed activities for which a Water use License should be obtained. The Section 21 listed activities include:

- (a) Taking water from a water resource;
- (b) Storing water;
- (c) Impeding or diverting the flow of water in a water course;
- (d) Engaging in a stream flow reduction activity contemplated in Section 36;
- (e) Engaging in a controlled activity identified as such in section 37(1) or declared under Section 38(1);
- (f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- (g) Disposing of waste in a manner which may detrimentally impact on a water resource;
- (h) Disposing in any manner which contains waste from, or which has been heated in any industrial or power generation process;
- (i) Altering the bed, banks, course or characteristics of a watercourse;
- (j) Removing, discharging, or disposing of waste found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- (k) Using waste for recreational purposes.

### 3.11 Conservation of Agricultural Resources Act

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The Conservation of Agricultural Resources Act ([CARA] Act 43, 1983) provides for the:

- Protection of wetlands; and
- Requires the removal of listed alien invasive species.

The National Department of Agriculture is the responsible authority for enforcing the CARA. This Act also requires that any declared invader species on Eskom land must be controlled according to their declared invader status. The Environmental Management Plan (EMP), which will be included within the Environmental Impact Report (EIR), will include the compulsory removal of invader plants from the construction area. The rehabilitation of the construction site must use indigenous plants.

### **3.12 National Environmental Management: Air Quality Act (Act No 39 of 2004)**

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The National Air Quality Act 39 of 2004 was promulgated but only enacted in September 2005. However, some sections of the Atmospheric Pollution Prevention Act (APPA) of 1965 are still valid and implemented and enforced by DEAT and more specifically, the Chief Air Pollution Control Officer or CAPCO.

### **3.13 National Road Traffic Act (Act 83 of 1996)**

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This Act is relevant if Eskom intends to transport, load, off-load or package dangerous goods as listed in SANA Code of Practice 10228.

### **3.14 The National Environmental Management: Waste Act (Act 59 of 2008)**

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The National Environmental Management: Waste Act, 2008 (Act No. 58 of 2008) (the Waste Act), came into operation on the 1<sup>st</sup> of July 2009. The Waste Act repealed Section 20 of the Environment Conservation Act, 1989 (Act No. 73 of 1989) (ECA) and introduced new provisions regarding the licensing of waste management activities. In terms of the Waste Act the Minister may publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment.

In terms of the Waste Act no person may commence, undertake or conduct a waste management activity except in accordance with:

- The requirements or standards determined in terms of the Waste Act for that activity; and
- A waste management license issued in respect of that activity, if a license is required.

A list of waste management activities was published on the 3<sup>rd</sup> of July 2009. This list of activities identifies activities that may not be commenced, undertaken or conducted by any person unless a waste management licence is issued in respect of that activity. The list of activities is divided into two Categories. A person who wished to commence, undertake or conduct, an activity listed under Category A, must conduct a Basic Assessment process, and a person who wished to commence, undertake or conduct an activity listed under Category B, must conduct a Scoping and EIA process, as stipulated in the EIA Regulations made under NEMA, as part of a waste management licence application in terms of the Waste Act.

### 3.15 Regional Plans

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The following regional plans will be considered during the execution of the EIA:

- Spatial Development Frameworks(where available);
- Integrated Development Plans;
- Relevant provincial, district and local policies and strategies.

### 3.16 Energy Sector Strategic Documents

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The EIA will further consider Energy Sector Strategic Documents, including the following:

- White Paper on the Energy Policy of the Republic of South Africa (December 1998);
- Eskom's Transmission Development Plan;
- Integrated Energy Plan;
- Integrated Strategic Electricity Planning (ISEP);
- Electricity Regulation Act (Act 4 of 2006) as amended;
- National Electricity Response Plan (NERP) (2008);
- National Guidelines on Environmental Impact Assessment for facilities to be included in the Electricity Response Plan (2008); and
- Environmental Impact Assessment Guidelines for transmission lines within the Southern African Power Pool Region (1999).

## 4 SCOPING & EIA PROCESS

The proposed Anderson-Dinaledi 400kV powerline project entails certain activities that require authorisation in terms of the National Environmental Management Act (No. 107 of 1998) (NEMA), as described in Section 3.1 above. The process for seeking authorisation is undertaken in accordance with the Environmental Impact Assessment (EIA) Regulations, 2006, promulgated in terms of Section 24(5) of the NEMA.

Section 24C(2)(d)(iii) of the National Environmental Management Amendment Act (Act 62 Of 2008) states that the Minister must be identified as the competent authority in terms of subsection (1) if an activity is undertaken, or is to be undertaken, by a statutory body, excluding any municipality, performing an exclusive competence of the national sphere of government.

Section 4(1) of Regulation 385 of the Environmental Impact Assessment Regulation, 2006, states that if the Minister is the competent authority in respect of a specific application, the application must be submitted to the Department of Environmental Affairs (DEA). Eskom is a parastatal or statutory body, and therefore the decision-making authority for this project in the Department of Environmental Affairs (DEA). The Department will make a decision on whether authorisation will be granted for this project or not based on the content of the Scoping and Environmental Impacts Assessment Reports which will be submitted to the Department for review and decision making. The Scoping and EIA Report will also be submitted to the following authorities for comment:

- Gauteng Department of Agriculture and Rural Development;
- North West Department of Agriculture, Conservation and Environment;
- Department of Water Affairs (DWA);
- National Department of Agriculture (NDA);
- Provincial Heritage Resources Authority, Gauteng;
- North West Provincial Heritage Resources Authority;
- Madibeng Local Municipality Environmental and Town Planning Departments; and
- City of Tshwane Local Municipality Environmental and Town Planning Departments.

Comment received from these authorities will be incorporated into the EIA Report which will be submitted to DEA for review and decision making.

The Scoping Phase is the first phase of an Environmental Impact Assessment. Once Scoping Report Approval has been obtained from the authorising authority, the EIA phase commences. A Scoping and EIA process consist of various phases. These phases have been illustrated in a Process Flow Diagram (Figure 9).

An application to undertake Scoping and EIA for this proposed project was submitted to DEA on the 21<sup>st</sup> of July 2009. DEA acknowledged receipt of this application from and issued the project with the following reference number: 12/12/20/1567. The acknowledgement letter from DEA is attached to Appendix C.

A meeting was held with DEA on the 8<sup>th</sup> of July 2010 during which DEA to discuss the Public Participation process to be followed, and whether DEA finds the 1km study corridor acceptable for the proposed powerline alternatives, and whether a 1x1km study area will be allowed for the proposed substation. Details on the outcome of the meeting with DEA is provided in the Issues and Response Table provided in Section 6 of this Report. The minutes of the meeting with DEA is attached to Appendix C.

### EIA Process Flow Diagram

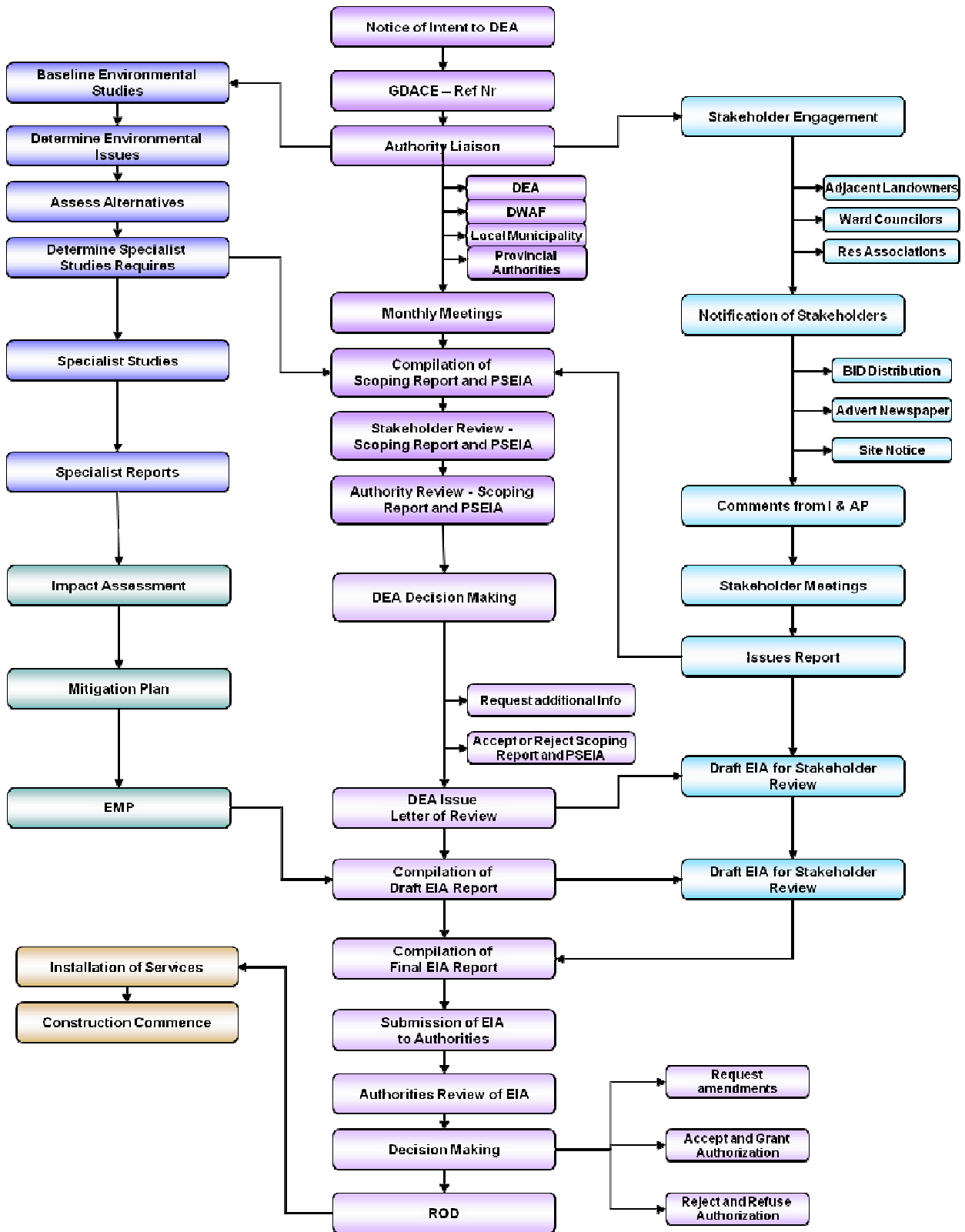


Figure 9: Scoping and EIA Process Flow Diagram

## 5 DESCRIPTION OF THE RECEIVING ENVIRONMENT

Details on the baseline receiving environment in which this project occurs and associated environmental issues are addressed in this section. Possible impacts on the receiving environment which may occur as a result of this proposed project are also addressed in this section. The potential impacts identified during the Scoping Phase will be assessed during the EIA Phase to determine the significance of these impacts and potential mitigation measures will be provided to avoid the impact, or to minimise the impact. Potential rehabilitation measures will also be provided for impacts which cannot be avoided. All mitigation and rehabilitation measures will be incorporated into the Environmental Management Plan which should be implemented during the construction, operational and decommissioning phases of the proposed project.

### 5.1 Geology

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#### 5.1.1 Data Collection

Information for the completion of this section was obtained from the following sources:

- Walmsley, D., and Walmzley, J (Mzuri Consultants, Pretoria) & Mangold, S., and Kalule-Sabiti, M.(Directorate Environment & Conservation North West Department of Agriculture, Conservation and Environment) (2002). *North West Province State of the Environment Report*. Available from: <http://www.environment.gov.za/soer/reports/northwest>
- Greater Pretoria Metropolitan Council. (2001). *Pretoria State of the Environment Report*. Available from: <http://www.cerol.net/reports/pretoria/issues/biology/indicat.htm>
- Department of Public Works. (June 2006). *Appropriate Development of Infrastructure on Dolomite: Manual for Consultants*. South Africa: Department of Public Works
- Ladislav, M., & Rutherford, M.C. (2006). *The vegetation of South Africa, Lesotho and Swaziland*. Pretoria: South African Biodiversity Institute (SANBI).

#### 5.1.2 Regional Description

With altitudes ranging from between 920-1782 metres above mean sea level (mamsl), the North West Province has one of the most uniform terrains of all the South Africa provinces.



The eastern part of the province is mountainous and includes the scenic Magaliesberg, while the western and central parts of the province is characterised by gently undulating plains. Ancient igneous rock formations dominate the north-eastern and north-central parts of the province. One of the most ancient preserved landscapes in the world, "the Gatsrand", occurs within the province, and is situated between Potchefstroom and Carletonville. The geology of the province is considered to be significant due to its mineral resources, which includes platinum, gold, uranium, iron, chrome, manganese and diamonds. In terms of the Environmental Potential Atlas Data (ENPAT) as was used during the compilation of the State of the Environment Report for the North West Province, Geology is the province is comprised of the following rock types:

Rock Type	
Siltstone	Andesite
Syenite	Arenite
Tillite	Basalt
Tuff	Carbonatite
Volcanic Rocks	Chert
Lutaceous Arenite	Clinopyroxenite
Migmatite	Conglomerate
Mudstone	Dolerite
Norite	Dolomite
Pyroclastic	Gabbro
Quartz Porphyry	Granite
Quartzite	Hartzburgte
Rhyolite	Iron Formation
Sand	Lava
Shale	Alkali-Feldspar Syenite

Geological formations in the Pretoria (Tswane) area (Gauteng) is comprised of the Pretoria Group Andesite, Bushveld Gabbro-Norite, Pretoria Group Shale, and the Pretoria Group Quartzite. The Magalies Mountain Range which is a protected natural environment forms part of the east-west quartzite ridge which is located in the Pretoria area. Dolomite occurs within the northern section of Centurion which forms a valuable aquifer. The southern part of the centurion area is underlain by Halfway House Granite and Bushveld Granite.

Most of the southern section of Pretoria which includes Rosslyn, Akasia, Pretoria North, Wonderboom, Doornpoort, and Klip/Kruisfontein is underlain by the Pretoria Group Andesite and Bushveld Gabbro-Norite. Expansive and impermeable clays which occurs in this area results in uneven weathering which causes geotechnical constraints. The northern part of Pretoria is underlain by Halfway House Granite and Bushveld Granite. Bushveld Granite furthermore underlies the whole of the Winterveld and Mabopane areas. Geotechnical constraints associated with the Bushveld Granites include the following:

- Collapsible soils;
- Uneven weathering which may result in differential settlement; and
- Localized perched water tables.

The Pienaars River area is underlain by the Bushveld Igneous Complex and is characterised by rocky soils and moderately expanding/shrinking soils. The tilting of the ancient Karoo deposits resulted in the rugged terrain located in the northern parts of the Crocodile River area. This rugged landscape formed the distinctive terrains of the Magaliesberg and the Witwatersberg. The Magaliesberg and Witwatersberg ridges are quartzite ridges, and the area between the ridges are known as the “Magaliesmoot” area. This Magaliesmoot area contains shale deposits of the Karoo Supergroup. Various gravel and clay quarries occur against the quartzite slopes in the moot area.

To the south of the Witwaterberg, an andesite range occurs which is known as the Schurweberg range. Dolomite occurs to the south of the Schurweberg area, and a number of sinkholes have already formed within this dolomitic area.

5.1.3 Site Description

The vegetation cover found within the 1km study corridors of the three powerline alternatives are provided in the table below (Table 5). A description of the geology found within areas where these vegetation types occur are also provided in this table. The details provided in this table are based on the SANBI data.

**Table 5: Vegetation Cover and Associated Geology**

Vegetation Type	Geology Description
Andesite Mountain Bushveld	In terms of the SANBI data the area predominately consist of tholeiitic basalt of the Klipriviersberg Group (Randian Ventersdorp Supergroup), also dark shale, micaceous sandstone and siltstone and thin coal seams of the Madzaringwe Formation [Karoo Supergroup, and andesite and conglomerate of the Pretoria Group

Vegetation Type	Geology Description
	(Vaalian Transvaal Supergroup)].
Gauteng Shale Mountain Bushveld	In terms of the SANBI data the area is dominated by shale and some coarser clastic sediments as well as significant andesite from the Pretoria Group (Transvaal Supergroup), all sedimentary rocks. A part of the area is underlain by Malmani dolomites of the Chuniespoort Group (Transvaal Supergroup). (Although dolomite is found in areas where this vegetation type occurs, no dolomite is found within the specific 1km study corridors of the alternative proposed powerline routes in terms of the Environmental Potential Atlas Data).
Gold Reef Mountain Bushveld	In terms of the SANBI data the area predominately consist of quartzites, conglomerates and some shale horizons of the Magaliesberg, Daspoort and Silverton Formations (Vaalian Pretoria Group), and the Hospital Hill, Turfontein and Government Subgroups (Randian Witwatersrand Supergroup).
Marikana Thornveld	In terms of the SANBI data most of the area is underlain by the mafic intrusive rocks of the Rustenburg Layered Suit of the Bushveld Igneous Complex. Rocks found in the area include gabbro, norite, pyroxenite and anorthosite. Shales and quartzites of the Pretoria Group (Transvaal Supergroup) also occurs on the area.
Moot Plains Bushveld	In terms of the SANBI data most of the area is underlain by clastic sediments and minor carbonates and volcanic of the Pretoria Group (including the Silverton Formation) and some Malmani dolomites in the west of South Africa, all of the Transvaal Supergroup (Vaalian). Mafic Bushveld intrusive are also found.
Norite Koppies Bushveld	In terms of the SANBI data most of the area is mostly underlain by gabbro and norite with interlayered anorthosite of the Pyramid Gabbro-Norite, Rustenbrug Layered Suite, with a small area of the Rashoop Granophyre Suite (felsic igneous rocks), both of the Bushveld Complex (Vaalian). Large rock boulders and very shallow lithosols occur.

### 5.1.4 Environmental Issues

Dolomite is soluble in water, i.e. dissolves in water. Therefore the seepage of rainwater and percolating ground water over time through joints, fractures and fault zones in the dolomite, gradually dissolves the dolomite, which gives rise to cave systems and voids.

Soils covering the rock can collapse into these caves or voids resulting in catastrophic ground movement on the surface such as sinkholes or dolines. Although dolomite occurs within the region, no dolomite occurs within the 1km study corridors, or on the sites considered for substation construction, and therefore no development will be undertaken on areas underlain by dolomite. The geology which occurs within the study corridor as well on the substation study sites was considered to be stable during the substation site selection process. . Therefore no significant environmental issues with regards to geology occur within the study area. A Geological and Geotechnical Investigation for each of the study sites identified for substation construction needs to be undertaken during the EIA Phase. Therefore no significant environmental issues with regards to geology occur within the study area.

### 5.1.5 Potential Impacts

The depth of soils in the study area is unknown, and therefore there is a possibility that construction activities may have an impact on the underlying geology, as the underlying geology may be exposed during excavations for pylon/tower footings. Access and construction roads will be required during the construction phase and maintenance roads will be required during the operational phase of the powerline. Where necessary access roads and maintenance roads need to be constructed. Cut and fill operations may be required where side slopes are steeper than 4%. Cut and fill operations will very likely disturb the underlying geology. It is not yet known whether blasting will be necessary during the construction phase. Blasting may lead to severe disturbance of the geological substrate, however, the geology in the study area is considered to be stable and impact could be minimal.

### 5.1.6 Cumulative Impacts

None expected, but will be investigated during the EIA phase.

### 5.1.7 Specialist Studies Required

Geological and Geotechnical Studies will not be undertaken during the EIA phase for this proposed project, as the exact route alignment will only be known once Environmental Authorisation has been obtained. A Geological and Geotechnical Study will be undertaken once the exact pylon location is known to ensure that pylon structures will be secure with the least amount of impact to geology in areas where the soil depth is shallow. The findings of the Geological and Geotechnical Study and specific conditions for construction as well as prescribed mitigation measures will be incorporated into the Final Environmental Management Plan which will be submitted to the Department of Environmental Affairs for review and approval.

There are no dolomites located within the study area and therefore a Dolomite Stability Assessment will not be required for this project.

## 5.2 Topography

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### 5.2.1 Data Collection

Information for the completion of this section was obtained from the following sources:

- Walmsley, D., and Walmzley, J (Mzuri Consultants, Pretoria) & Mangold, S., and Kalule-Sabiti, M.(Directorate Environment & Conservation North West Department of Agriculture, Conservation and Environment) (2002). *North West Province State of the Environment Report*. Available from: <http://www.environment.gov.za/soer/reports/northwest>
- Greater Pretoria Metropolitan Council. (2001). *Pretoria State of the Environment Report*. Available from: <http://www.ceroi.net/reports/pretoria/issues.htm>
- Ladislav, M., & Rutherford, M.C. (2006). *The vegetation of South Africa, Lesotho and Swaziland*. Pretoria: South African Biodiversity Institute (SANBI).

### 5.2.2 Regional Description

As mentioned in Section 5.1.2, the North West Province has one of the most uniform terrains of all South African Provinces with altitudes ranging from between 920-1782 metres above mean sea level (mamsl). The eastern part of the province is mountainous and includes the scenic Magaliesberg, while the western and central parts of the province is characterised by gently undulating plains. The surface topography of the area within the Gauteng Province which the proposed eastern route alternative will traverse is described as a rugged landscape with hills and slopes of the Magaliesberg and the Witwatersberg. Approximately 20 ridges occur in the Tshwane (Pretoria) area, of which the most sensitive ridges include the Bronberge, The Magaliesberg, Daspoort, Meintjieskop, Tuine Bult Koppies and the Witwatersberg.

### 5.2.3 Site Description

The proposed alternative powerline routes and associated 1km study area traverses the Magaliesberg as well as the Witwatersberg.

In terms of the South African National Biodiversity Institute (SANBI) data, the vegetation cover in the study area is comprised of Andesite Mountain Bushveld, Gauteng Shale Mountain Bushveld, Gold Reef Mountain Bushveld, Marikana Thornveld, Moot Plains Bushveld, and Norite Koppies Bushveld. The landscape character associated with each of these vegetation types are tabled below (Table 6):

**Table 6: Vegetation Types and Associated Topography**

<b>Vegetation Type</b>	<b>Associated Landscape Character</b>
Andesite Mountain Bushveld	Undulating landscape with hills and valleys.
Gauteng Shale Mountain Bushveld	Low broken ridges varying in steepness with high surface rock cover.
Gold Reef Mountain Bushveld	Rocky hills and ridges often west-east trending.
Marikana Thornveld	Valleys and slightly undulating plains with some low hills.
Moot Plains Bushveld	Plains and some low hills.
Norite Koppies Bushveld	Plains, koppies and noritic outcrops.

### 5.2.4 Environmental Issues

The topography of the area which the powerline alternatives and study corridor traverse varies in character, consisting of plains, hills with steep slopes and gentle slopes, valleys, and ridges. Various types of land uses occurs along the proposed alternative routes. These land uses is mainly comprised of agriculture, mining, conservation, industrial, commercial, recreational and residential. Development along the route also varies and therefore the existing impact to topography and surface water drainage patterns as a result of development also varies. All route alternatives traverse the Magaliesberg (which is natural protected environment) as well as the Witwatersberg.

It is not yet known whether cut and fill operations or blasting will be required to level surfaces where necessary for pylon construction. Cut and fill operations or blasting to create a levelled surface will alter the surface topography and will alter surface water drainage patterns. Construction/maintenance roads will be required during the construction and operational phases of the proposed powerline. The construction/maintenance road will most likely be gravel roads which will be located within the Eskom servitude. It is also not yet known whether blasting, or cut and fill operations will be undertaken for the construction of access and construction/maintenance roads. Therefore the construction of the proposed powerline and construction/maintenance roads may alter surface topography and surface water drainage patterns. The extent of impact to topography for pylon construction should blasting or cut and fill be required will be minimal and spaced far apart, where the impact for road construction will be continues in some sections with a larger impact footprint.

### 5.2.5 Potential Impacts

It is not yet known whether blasting, or cut and fill operations will be undertaken to create a levelled surface for powerline construction and access and maintenance road construction. Cutting and filling for road construction purposes is normally not allowed in areas where the side slope is 4% or less. Each pylon requires a concrete footing. The size of the concrete footing is dependent on the type of pylon. In areas where steep slopes occur levelling of the tower sites may be required. Surface topography may therefore be altered as a result of cut and fill operation for pylon and road construction. The extent of the impact is not yet known as the exact powerline route is not yet known and will be assessed during the impact assessment phase. Impact to surface topography alters surface water drainage patterns.

### 5.2.6 Cumulative Impacts

There will be no substantive increase to topographic impacts when compared to the existing level of impact in the surrounding area, and therefore no cumulative impact is expected.

### 5.2.7 Specialist Studies Required

A Stormwater Management Plan will be compiled as part of the engineering studies and final powerline design which will provide amongst others, specifications for the channelling of stormwater during the construction and operational phases. No further specialist studies are recommended.

## 5.3 Climate

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### 5.3.1 Data Collection

Information for the completion of this section was obtained from the following resources:

- Walmsley, D., and Walmsley, J (Mzuri Consultants, Pretoria) & Mangold, S., and Kalule-Sabiti, M.(Directorate Environment & Conservation North West Department of Agriculture, Conservation and Environment) (2002). *North West Province State of the Environment Report*. Available from: <http://www.environment.gov.za/soer/reports/northwest>; and
- Greater Pretoria Metropolitan Council. (2001). *Pretoria State of the Environment Report*. Available from: <http://www.ceroi.net/reports/pretoria/issues.htm>
- Custom Weather Inc (My Forecast). (2010). *Historical Weather Information for Pretoria, South Africa*. Available from: <http://www.myforecast.com/bin/climate.m?city=77209&metric=false>
- South African Weather Services. Wind Data for the Hartbeespoort Dam area from November 2009 to October 2010.

### 5.3.2 Temperature

There are wide seasonal and daily variations in temperature in the North West Province. The summers are warm to very hot with average daily maximum temperatures of 32 °C in January.



The winter days are sunny and temperate while the winter nights are cool to cold, with average daily minimum temperatures of 0.9 °C in July. The far western part of the province is arid, with the central part of the province being semi-arid, and the eastern part of the province being predominantly temperate.

Although Gauteng is quite close to the equator, the temperatures are moderate because of the high altitude above sea level. The Tshwane area experiences average daily maximum temperature of 30°C during summer (January), and average daily maximum temperatures of 18.3°C during winter (June). The Tshwane region is the coldest during July when the mercury drops to 1.7°C on average during the night.

### 5.3.3 Precipitation

The North West Province falls within a summer rainfall region, and rainfall often occurs in the form of late afternoon thundershowers. Rainfall in the province is highly variable both regionally and in time. The western part of the province which is classified as being arid receives less than 300mm of rain per annum, while the central semi-arid region receives 500mm of rain per annum. The eastern and south-eastern temperate part of the region receives over 600mm of rain per annum. Droughts and floods is a regular occurrence at a provincial and local scale. In most parts of the province, evaporation exceeds rainfall.

The Gauteng Province also falls within a summer rainfall region, and rainfall in this province occurs in the form of thunderstorms in the late afternoons from November to March. The average rainfall in the Tshwane area is 573-650mm per annum, with most rainfall occurring during summer. Rainfall in the Tshwane area is lowest during June (0mm) and highest in January (110mm).

### 5.3.4 Wind

The predominant wind direction in the Tshwane area is north-northeast. Historical wind speed and wind direction information for the Tshwane area was obtained from “MyForecast”. The annual average wind speed and direction of the area is tabled below.

**Table 7: Average Wind Speed and Direction for the Pretoria (Tshwane Area)**

Tshwane (Pretoria)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Average Windspeed (mph)	6	6	6	6	6	6	7	8	8	7	6	6
Average Wind Direction	NE	E	E	W	w	W	W	W	NE	NE	NE	NE

Historical wind data for the Hartbeespoort Dam area was obtained from Weather SA. Weather SA indicated that this wind information is the only available information for the study area.

A wind rose is provided in Figure 10 which shows the average wind speed and direction in the Hartbeespoort Dam area from November 2009 to October 2010.

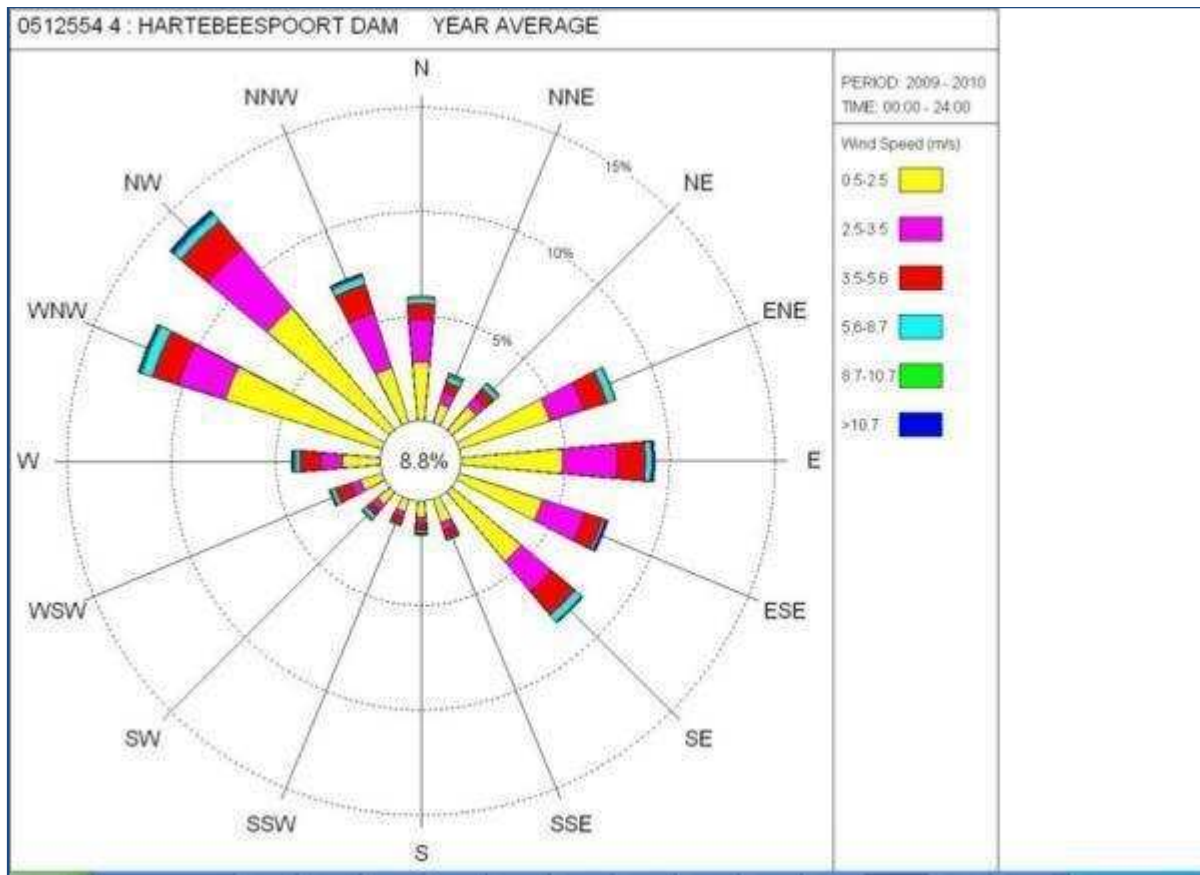


Figure 10: Wind Rose for Hartbeespoort Dam (November 2009-October 2010)

The predominant wind direction for this period as indicated on the wind rose is north-west and west-northwest. The average wind speed for this period was between 0.5-2.5m/s.

### 5.3.5 Environmental Issues

There are no issues to report on with regards to climate. The proposed powerline will not have an impact on climate in the area, and the climatological conditions in the area will not have an impact on the proposed powerline. There is a certain amount of noise generated by the flow of high voltage electricity through the cables which could be heard when standing directly underneath the powerline. It is not expected that this noise will travel by wind as the noise impact generated by the powerlines is very low.

### 5.3.6 Potential Impacts

The Anderson-Dinaledi 400kV powerline project forms part of the Medupi integration project, and although the proposed powerline will not have an impact on climate in the study area or a provincial or national scale, the proposed Medupi Power Station may over a period of time contribute to global warming due to the release of greenhouse gasses during the coal burning process for power generation which could be considered as a national or even global impact.

### 5.3.7 Cumulative Impacts

As mentioned previously the proposed powerlines will not have an impact on climate. However, the Medupi power station could contribute to greenhouse gasses being released into the atmosphere which will could contribute to global warming.

### 5.3.8 Specialist Studies Required

No specialist studies are required for the proposed Anderson-Dinaledi project. The proposed impacts of the Medupi power station would have been assessed and addressed as part of the Environmental Impact Assessment which was undertaken for the power station.

## 5.4 Soils and Land Capability

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### 5.4.1 Data Collection

- Conservation Plan Data (C-Plan) (GIS Data) from the GDARD;
- Ladislav, M., & Rutherford, M.C. (2006). *The vegetation of South Africa, Lesotho and Swaziland*. Pretoria: South African Biodiversity Institute (SANBI).
- Walmsley, D., and Walmzley, J (Mzuri Consultants, Pretoria) & Mangold, S., and Kalule-Sabiti, M.(Directorate Environment & Conservation North West Department of Agriculture, Conservation and Environment) (2002). *North West Province State of the Environment Report*. Available from: <http://www.environment.gov.za/soer/reports/northwest>

- Greater Pretoria Metropolitan Council. (2001). *Pretoria State of the Environment Report*. Available from: <http://www.ceroi.net/reports/pretoria/issues.htm>
- Gauteng Department of Agriculture and Rural Development. (2004). *Gauteng State of the Environment Report*. Available from: <http://www.environment.gov.za/soer/reports/gauteng.html>

### 5.4.2 Regional Description

According to the North West Province State of the Environment Report the province in general is showing signs of increased land and soil degradation. Signs of degradation and desertification can be seen in all magisterial districts. The areas most severely affected are those areas that are communally managed. In terms of soil and land degradation, the province is ranked as the fourth worst affected province in South Africa. Soil and land degradation in the province has numerous negative consequences for agriculture in the area, such as decreased productivity of the croplands. Water and wind erosion is the major contributors to soil degradation in the province.

In terms of the Gauteng State of the Environment Report, the Gauteng Province where ranked as the second least degraded province in South Africa. Gauteng has the lowest veld degradation index in South Africa (31 on a scale of 0-540) and the fourth lowest soil degradation index (113 on a scale of -97 to 650).

### 5.4.3 Site Description

The vegetation cover found within the 1km study corridors of the three powerline alternatives are provided in the table below (Table 8). A description of the soils found within areas where these vegetation types occur are also provided in this table. The details provided in this table are based on the SANBI data.

**Table 8: Vegetation Type and Associated Soil**

Vegetation Type	Soil Description
Andesite Mountain Bushveld	Soils found in areas where this vegetation type occurs is described as shallow, rocky, clayey soils mainly of the Mispah and Glenrosa forms.
Gauteng Shale Mountain Bushveld	Soils found in areas where this vegetation type occurs are mostly shallow Mispah, but are deeper at the foot of slopes.
Gold Reef Mountain Bushveld	Soils found in areas where this vegetation type occurs is described as shallow, gravel lithosols of the Mispah and Glenrosa forms.
Marikana Thornveld	Soils found in areas where this vegetation type occurs is described as mainly vertic melanic clays with some dystrophic or mesotrophic

Vegetation Type	Soil Description
	plinthic catenas and come freely drained, deep soils.
Moot Plains Bushveld	Soils found in areas where this vegetation type occurs is often stony with colluvial clay-loam but varied, including red-yellow apedal freely drained, dystrophic and eutrophic plinthic catenas, vertic and melanic clays, and some less typical Glenrosa and Mispah forms.
Norite Koppies Bushveld	Soils found in areas where this vegetation type occurs are well-drained, Glenrosa and Mispah forms and in some areas vertic, melanic clays are found.

In terms of the Gauteng Conservation Plan (C-Plan) data as compiled by the Gauteng Department of Agriculture and Rural Development (GDARD), the soils found along the portion of the study area which is located within the Gauteng Province varies from having a high agricultural potential to a very low agricultural potential. The majority of the soils are of very low to low agricultural potential with a few sections along the southern part of the eastern route alternative containing moderate to high agricultural potential soils.

In terms of the North West State of the Environment Report soil and land degradation in the study area is low.

#### 5.4.4 Environmental Issues

In terms of the North West Province State of the Environment Report soil and land degradation in the study area is low. Furthermore, in terms of the GDARD C-Plan data, sections of the study area which falls within the Gauteng Province contains high agricultural potential soils.

#### 5.4.5 Potential Impacts

Clearance of vegetation in the servitude for pylon construction and access and construction/maintenance roads will leave the soil bare and exposed to wind and water erosion. Where vegetation clearance is undertaken on steep slopes soil erosion due to wind and water erosion could be worse. Furthermore, during the construction phase, activities such as topsoil stripping, removal and stockpiling of subsoil, and soil compaction will impact negatively on soils and will consequently impact on the land capability of the study area. Materials lay down areas along the servitude as well as heavy vehicle and construction vehicle traffic within the servitude area will contribute to soils compaction. Areas compacted will lose their soil structure and fertility permanently. Furthermore, there is a risk of pollution by hydrocarbon spillages.

### 5.4.6 Cumulative Impacts

Existing linear developments such as roads, railway lines and powerlines already occur within the study area. Furthermore various mines and quarries occur within the study area. With the correct implementation measures for the prevention of wind and water erosion, adequate vegetation management as well as the compilation and implementation of a rehabilitation plan during the construction and operational phases it is not expected that impacts to soil and land capability will be significant when compared to the existing level of impact in the surrounding area, and therefore no cumulative impact is expected.

### 5.4.7 Specialist Studies Required

A Soil and Land Capability Assessment should be undertaken during the EIA phase.

## 5.5 Land Use

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### 5.5.1 Data Collection

- Walmsley, D., and Walmzley, J (Mzuri Consultants, Pretoria) & Mangold, S., and Kalule-Sabiti, M.(Directorate Environment & Conservation North West Department of Agriculture, Conservation and Environment) (2002). *North West Province State of the Environment Report*. Available from: <http://www.environment.gov.za/soer/reports/northwest>
- Greater Pretoria Metropolitan Council. (2001). *Pretoria State of the Environment Report*. Available from: <http://www.ceroi.net/reports/pretoria/issues.htm>
- Gauteng Department of Agriculture and Rural Development. (2004). *Gauteng State of the Environment Report*. Available from: <http://www.environment.gov.za/soer/reports/gauteng.html>

### 5.5.2 Regional Description

In terms of the North West Province State of the Environment Report, the North West Province is approximately 11,632,000 ha in extent. Land use in the North West Province mainly comprises of agriculture, mining, conservation, industrial, commercial, recreational and residential.

Approximately 9,421,920 ha (81%) of the total land area is considered as potential farming land. Of this total potential farming land, approximately 2,638,138 ha (28%) is potentially arable, approximately 4,334,083 ha (46%) is grazing land and approximately 603,002.9 ha (6,4%) is used for nature conservation. During 2001 the agricultural land use patterns included the following (Table 9);

**Table 9: Land Use Patterns – North West Province (2001)**

Agricultural Land Use Pattern	Approximate Area of Coverage
Field Crops	2,06 million ha
Horticultural crops	67 879 ha
Grazing land	2,97 million ha
Mixed farming	1,2 million ha

The land use patterns in the province are linked to ownership. Three main types of ownership occur within the province which includes, privately owned land, communal or tribal lands and state owner land. During 2001, most of the land in the Province was privately owned and the landowners where mainly committed to agriculture.

Livestock and cropping are the main agricultural activities undertaken in the eastern part of the province which is the higher rainfall area, whilst livestock and wildlife farming are prevalent in the western drier parts of the province. Three major irrigation schemes occur within the province which includes the Crocodlie, Vaal and Harts Rivers. The Vaalharts irrigation scheme is the largest scheme in the province. Details of this scheme are detailed below.

Irrigation Scheme	Approximate Area of Coverage	Crops under Irrigation
Vaalharts irrigation area	43 700 ha	Wheat (36% of area) Maize (23% of area) Groundnut (22% of area)

Several smaller irrigation schemes also occur in the province which includes the Taung, Manyeding, Bodibe and Tlhaping-Tlharo schemes. The total area under irrigation by these smaller schemes is approximately 4,500 ha in extent. The total area under irrigation in the province is approximately 50,000 ha.

Mining forms a significant land use in the province, and several mining areas occur within the province. These mining areas are predominantly located within the Bushveld Complex which is described as a sill-like mineral-rich geological feature of approximately 50,000 km in extent.

Mining activities in the province mainly occur in the Rustenburg area and Southern Districts, and include the extraction of uranium, gold, iron, chrome, manganese, platinum, coal, granite, marble, slate, limestone, wonderstone, and andalusite. Stone crushing, clay and sand pits and quarries are also found in the province. Commercial, industrial, and residential land uses, as well as roads and dams are estimated to contribute to approximately 15% of the total land use.

In terms of the Gauteng State of the Environment Report, the land use in the area where the eastern route alternative traverse the Gauteng Province is mainly comprised of conservation, and unspecified land uses, with very small sections of cultivation.

### 5.5.3 Site Description

A list of properties currently directly affected by the proposed centre line of the powerline route alternatives, as well as a list of properties which falls within the 1km study area have listed in Section 1.4 and 1.5 above. Land uses within the 1km study corridor of the proposed alternative powerline routes includes agriculture, mining, conservation, tourism, industrial, commercial, recreational and residential. Existing linear infrastructure such as roads, railway lines and powerlines already occur within the study area. A breakdown of the total number of properties affected by each route alternative is provided below (Table 10).

**Table 10: Route Alternatives and Number of Properties Affected by Each Alternative**

Route Alternative	Number of Properties Affected
Eastern Route Alternative	59
Eastern Route Alternative Deviation	2
Central Route Alternative	19
Western Route Alternative	49
Western Route Alternative Deviation 1 (Western Deviation)	35
Western Route Alternative Deviation 2 (Eastern Deviation)	11
Western Route Alternative Deviation 3 (Southern Deviation)	14

### 5.5.4 Environmental Issues

Land uses within the 1km study corridor of the proposed alternative powerline routes includes agriculture, mining, conservation, tourism, industrial, commercial, recreational and residential. Existing linear infrastructure such as roads, railway lines and powerlines already occur within the study area.



The proposed powerline will have a limited development footprint, however, the powerline requires a 55m wide servitude within which development is restricted. Therefore the proposed powerline and servitude could impact on future development and expansions to existing development and infrastructure. Certain farming activities may take place underneath the powerline and within the 55m servitude and livestock and wildlife may graze underneath the powerlines and within the 55m wide servitude.

It is not anticipated that existing land uses will impact on the proposed powerline, however, blasting undertaken at mines and quarries could have an impact on the stability of the tower structures. Blasting may not be undertaken within a distance of 500m of powerlines, therefore the powerlines will impact on mining activities.

### 5.5.5 Potential Impacts

The impact which could be experienced by existing land uses during the construction and operational phases of the proposed powerline are quite different in nature and are provided in the table below:

Land Use	Impact During Construction Phase	Impacts During Operational Phase
Agriculture / Game Farming	<ul style="list-style-type: none"> <li>• Negative impact on resource use such as:                             <ul style="list-style-type: none"> <li>○ Interference of breeding patterns of livestock and game due to construction activities;</li> <li>○ Displacement of livestock and game near the servitude area;</li> <li>○ Interruption of hunting activities;</li> <li>○ Damage to grazing fields;</li> <li>○ Damage to crops or interference with crop production;</li> <li>○ Soil compaction due to heavy vehicle traffic;</li> <li>○ Loss of high agricultural potential soils;</li> <li>○ Noise impact due to construction activities;</li> <li>○ Visual impact during construction phase;</li> <li>○ Damage to farm roads due to heavy vehicle usage;</li> <li>○ Poaching of wildlife; and</li> <li>○ Livestock theft.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Damage to crops or grazing fields due to maintenance activities;</li> <li>• Damage to crops or grazing fields due to veld fires which could occur as a result of line outages or conductor blowouts;</li> <li>• Damage to fences and access gates during maintenance activities could result in livestock or wildlife escaping;</li> <li>• Security issues due to possible damage to fences and gates;</li> <li>• Limitations on future development or farming activities as no structures may be erected within the servitude and as pivot irrigation cannot be undertaken within the servitude area or underneath the powerline;</li> <li>• Visual impact.</li> </ul>
Mines and Quarries	<ul style="list-style-type: none"> <li>• Construction works within servitude could impact on accessibility to various mining areas;</li> <li>• Blasting activities at mines or quarries could impact on powerline construction activities;</li> <li>• Traffic on mine area would increase as heavy mine vehicles and machinery and heavy construction vehicles and</li> </ul>	<ul style="list-style-type: none"> <li>• Security control access issues of Eskom maintenance crews during operational maintenance activities; and</li> <li>• Limitation to future mine expansions or expansion or development of new infrastructure.</li> </ul>

Land Use	Impact During Construction Phase	Impacts During Operational Phase
	<p>machinery will be present on site during the construction phase;</p> <ul style="list-style-type: none"> <li>• Damage to road surfaces to due increased number of heavy vehicles travelling on the roads;</li> <li>• Access roads and haul roads to mines could be come heavily congested due to heavy mining vehicles and construction vehicles; and</li> <li>• Security issues as construction workers and construction vehicles need access to mines during the construction phase.</li> </ul>	
<p>Tourism / Recreational</p>	<ul style="list-style-type: none"> <li>• Visual impact during construction phase due to vegetation clearance, construction camps, and materials lay down areas;</li> <li>• Noise impact as a result of construction activities;</li> <li>• Loss of income during construction phase as noise and visual impact could make area of activities less attractive to tourists;</li> <li>• Increase in traffic volumes during the construction phase due to construction vehicle traffic; and</li> <li>• Damage to existing road surfaces due to heavy vehicle usage.</li> </ul>	<ul style="list-style-type: none"> <li>• Permanent visual impact during the operational phase.</li> </ul>
<p>Conservation</p>	<ul style="list-style-type: none"> <li>• Visual impact during construction phase due to vegetation clearance, construction camps, and materials lay down areas;</li> <li>• Noise impact as a result of construction activities;</li> <li>• Disturbance to vegetation cover, damage and loss of vegetation cover during the construction phase;</li> <li>• Soil erosion due to wind and water erosion as a result of vegetation clearance and vegetation disturbance;</li> <li>• Increased risk of spreading of alien invasive vegetation species due to vegetation disturbance; and</li> <li>• Possible impact to sites or artefacts of historical or cultural importance; and</li> <li>• Disturbance to habitat of sensitive faunal, floral and avifaunal species.</li> </ul>	<ul style="list-style-type: none"> <li>• Permanent visual impact during the operational phase;</li> <li>• Permanent habitat disturbance due to maintenance roads and pylon footings; and</li> <li>• Damage natural vegetation and habitat due to veld fires which could occur as a result when a conductor blows.</li> </ul>
<p>Industrial</p>	<ul style="list-style-type: none"> <li>• Increase in traffic volumes during the construction phase due to construction vehicle traffic; and</li> <li>• Access roads to industries could become heavily congested due to increase in heavy vehicle usage during construction phase; and</li> <li>• Damage to existing road surfaces due to heavy vehicle usage</li> </ul>	<ul style="list-style-type: none"> <li>• Future development or infrastructural expansions.</li> </ul>
<p>Commercial</p>	<ul style="list-style-type: none"> <li>• Visual impact during construction phase due to vegetation clearance, construction camps, and materials lay down areas;</li> </ul>	<ul style="list-style-type: none"> <li>• Future development or infrastructural expansions.</li> </ul>

Land Use	Impact During Construction Phase	Impacts During Operational Phase
	<ul style="list-style-type: none"> <li>Noise impact as a result of construction activities;</li> <li>Loss of income during construction phase as noise and visual become a nuisance to client/consumers and;</li> <li>Increase in traffic volumes during the construction phase due to construction vehicle traffic; and</li> <li>Damage to existing road surfaces due to heavy vehicle usage</li> </ul>	
Residential	<ul style="list-style-type: none"> <li>Visual impact during construction phase due to vegetation clearance, construction camps, and materials lay down areas;</li> <li>Noise impact as a result of construction activities;</li> <li>Increase in crime levels during the construction phase;</li> <li>Increase in traffic volumes during the construction phase due to construction vehicle traffic; and</li> <li>Damage to existing road surfaces due to heavy vehicle usage</li> </ul>	<ul style="list-style-type: none"> <li>Permanent visual impact; and</li> <li>Limitations to future development and expansions to existing development.</li> </ul>
Linear Infrastructure (Roads, Powerlines, railway lines, telecommunications infrastructure)	<ul style="list-style-type: none"> <li>Traffic disruption on major and minor roads during the construction phase for construction purposes;</li> <li>Increase in traffic volumes during the construction phase due to construction vehicle traffic;</li> <li>Damage to existing road surfaces due to heavy vehicle usage;</li> <li>Possible disruptions to railway traffic for construction purposes; and</li> <li>Possible damage to railway Overhead Transmission Equipment as well as Telkom lines and posts during the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>Servitude management and ownership issues as powerline needs to cross over road and rail servitudes; and</li> <li>Possible limitations to future road and railway expansions.</li> </ul>

### 5.5.6 Cumulative Impacts

None expected. But will be investigated during the EIA Phase.

### 5.5.7 Specialist Studies Required

A Visual Impact Assessment will be undertaken during the EIA Phase.

## 5.6 Flora

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### 5.6.1 Data Collection

Information for the completion of this section was obtained from the following sources:

- Walmsley, D., and Walmzley, J (Mzuri Consultants, Pretoria) & Mangold, S., and Kalule-Sabiti, M.(Directorate Environment & Conservation North West Department of Agriculture, Conservation and Environment) (2002). *North West Province State of the Environment Report*. Available from: <http://www.environment.gov.za/soer/reports/northwest>
- Greater Pretoria Metropolitan Council. (2001). *Pretoria State of the Environment Report*. Available from: <http://www.cerol.net/reports/pretoria/issues/biology/indicat.htm>
- Mucina, M. and Rutherford, C. (2006). *The Vegetation of South Africa, Lesotho and Swaziland*, 2006. South Africa: South African National Biodiversity Institute (SANBI)
- SANBI Red Data Plant Species Information per the Quarter Degree Squares: Available From: (<http://posa.sanbi.org>)

### 5.6.2 Regional Description

In terms of the North West State of Environment Report two major biomes occur within the Province which includes the Grassland Biome and the Savanna Biome. As mentioned in Section 5.1.2, the North West Province has one of the most uniform terrains of all South African Provinces with altitudes ranging from between 920-1782 metres above mean sea level (mamsl). The eastern part of the province is mountainous and includes the scenic Magaliesberg, while the western and central parts of the province is characterised by gently undulating plains. The surface topography of the area within the Gauteng Province which the proposed western route alternative will traverse is described as a rugged landscape with hills and slopes of the Magaliesberg and the Witwatersberg.

The proposed powerline route is located within the following quarter degree squares in terms of the 1:50 000 grid of South Africa, namely 2527DB and 2527DD. The South African Biodiversity Institute (SANBI) used this grid system as a point of reference to determine sensitive, vulnerable, Orange and Red Data plant species which occurs in South Africa, or which could potentially occur within an area. The table (Table 11) below provides details on the Red Data plant species which has been recorded for these two quarter degree squares.

Table 11: Red Data Plant Species for Quarter Degree Squares 2527DB and 2527DD

Family	Species	Conservation Status	Form
Amaryllidaceae	<i>Boophone disticha</i>	Declining	Geophyte
Amaryllidaceae	<i>Crinum macowanii</i>	Declining	Geophyte
Apocynaceae	<i>Stenostelma umbelluliferum</i>	Near Threatened	Herb
Aquifoliaceae	<i>Ilex mitis</i> var. <i>mitis</i>	Declining	Shrub, tree
Asteraceae	<i>Callilepis leptophylla.</i>	Declining	Herb
Capparaceae	<i>Cleome conrathii</i>	Near Threatened	Herb
Crassulaceae	<i>Adromischus umbraticola</i> subsp. <i>umbraticola</i>	Near Threatened	Dwarf Shrub
Fabaceae	<i>Melolobium subspicatum</i>	Vulnerable	Dwarf shrub
Gunneraceae	<i>Gunnera perpensa.</i>	Declining	Herb
Hyacinthaceae	<i>Bowiea volubilis.</i> subsp. <i>volubilis</i>	Vulnerable	Climber
Hyacinthaceae	<i>Drimia elata.</i>	Data Deficient Taxon	Geophyte
Hyacinthaceae	<i>Drimia sanguinea</i>	Near Threatened	Geophyte
Hypoxidaceae	<i>Hypoxis hemerocallidea</i>	Declining	Geophyte
Myrothamnaceae	<i>Myrothamnus flabellifolius.</i>	DDT	Dwarf shrub
Orchidaceae	<i>Habenaria mossii</i>	Endangered	Geophyte

### 5.6.3 Site Description

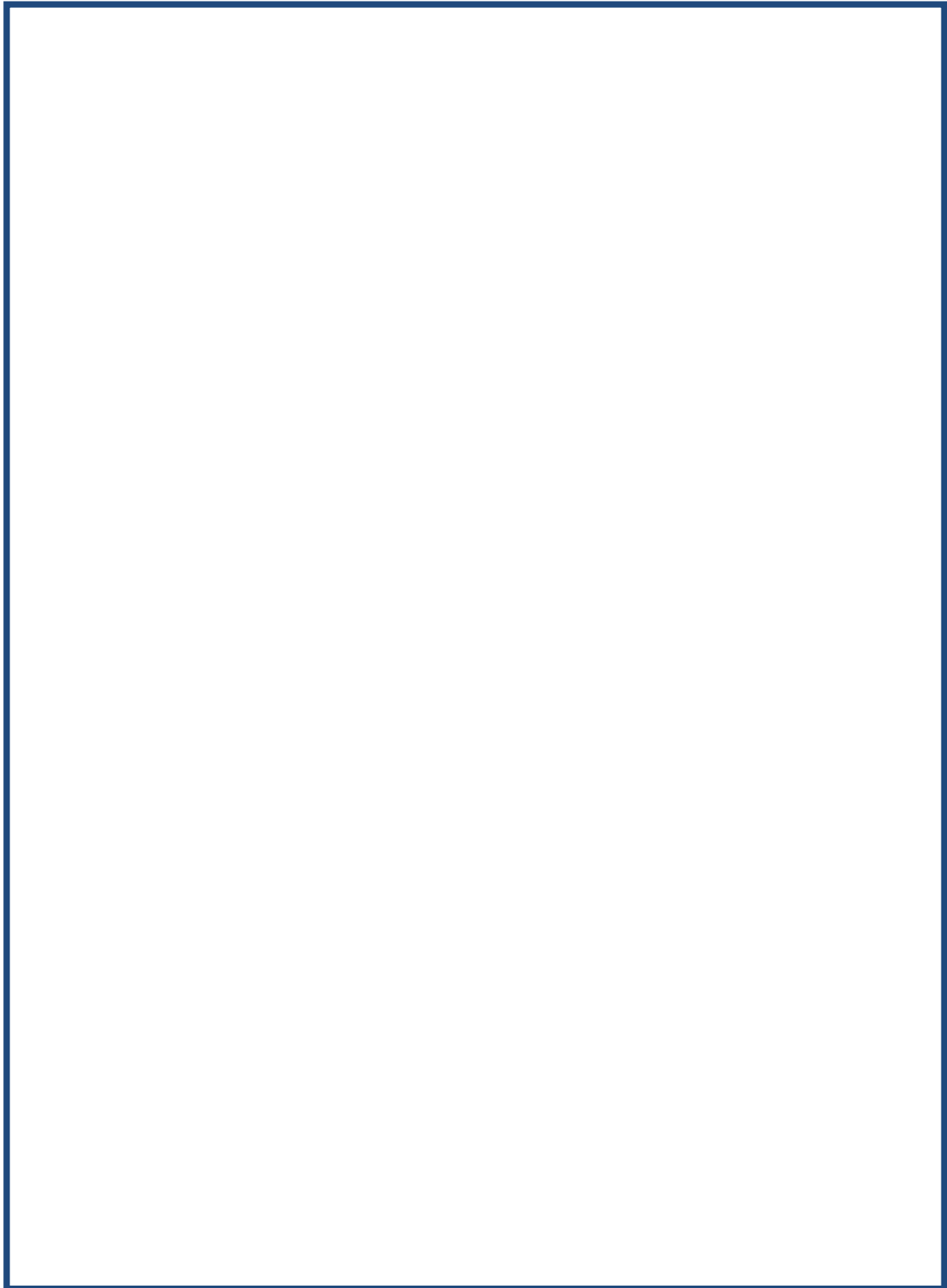
The proposed alternative powerline routes and associated 1km study area traverses the Magaliesberg as well as the Witwatersberg. In terms of the South African National Biodiversity Institute (SANBI) data, the vegetation cover in the study area is comprised of Andesite Mountain Bushveld, Gauteng Shale Mountain Bushveld, Gold Reef Mountain Bushveld, Marikana Thornveld, Moot Plains Bushveld, and Norite Koppies Bushveld. The table below (Table 12) provides details on the conservation status of the vegetation types found within the study area.

Table 12: Study Area Vegetation Types and Associated Conservation Status

Vegetation Type	Associated Landscape Character	Conservation Status
Andesite Mountain Bushveld	Undulating landscape with hills and valleys.	Least Threatened
Gauteng Shale Mountain Bushveld	Low broken ridges varying in steepness with high surface rock cover.	Vulnerable
Gold Reef Mountain Bushveld	Rocky hills and ridges often west-east trending.	Least Threatened

Vegetation Type	Associated Landscape Character	Conservation Status
Marikana Thornveld	Valleys and slightly undulating plains with some low hills.	Endangered
Moot Plains Bushveld	Plains and some low hills.	Vulnerable
Norite Koppies Bushveld	Plains, koppies and noritic outcrops.	Least Threatened

The proposed powerline will traverse through the Magaliesberg Protected Natural Environment (MPNE), which is administered by the Gauteng Department of Agriculture, and Rural Development (GDARD). The Magaliesberg range was proclaimed as a Protected Natural Environment (PNE) in 1994 in terms of the Environment Conservation Act, 1989 (Act 73 of 1989). The MPNE is considered to be almost 100 times older than Mount Everest and has unique geology, topography and biodiverse habitats as well as heritage features. The areas proclaimed as MPNE are mostly privately owned and no formal fence clearly demarcates the MPNE boundary. This adds to the ad hoc management and activities especially on the edges of the MPNE. Refer to Figure 11 for an illustration of the Vegetation types found within the study area.



**Figure 11: Vegetation Types Found within Study Area**

### 5.6.4 Environmental Issues

The proposed powerline alternatives traverse the Magaliesberg (therefore the Magaliesberg Protected Environment) as well as the Witwatersberg. Many diverse habitats occur within the study area, as well as vulnerable and endangered vegetation types.

### 5.6.5 Potential Impacts

Potential impacts to vegetation during the construction phase include the following:

- Clearing of vegetation from servitude;
- Total destruction of vegetation at tower footings;
- Potential loss of rare, endangered or protected vegetation species due to habitat destruction;
- Loss of topsoil due to soil stripping, wind and water erosion;
- Damage to vegetation cover due to construction vehicle traffic as well as material lay down areas;
- Damage to vegetation due to accidental hydrocarbon spillages;
- Disturbance of natural vegetation along access or construction roads through trampling and construction vehicle traffic; and
- Establishment and spread of declared weeds and alien invader plants from disturbed areas, which can lead to the eventual replacement of indigenous vegetation.

Potential impacts to vegetation during the operational phase:

- Damage to vegetation due to movement of maintenance vehicles on vegetated areas;
- Establishment and spread of declared weeds and alien invader plants from disturbed areas, which can lead to the eventual replacement of indigenous vegetation;
- Incorrect management of vegetation within the servitude; and
- Risk of Veld fires as a result of line shortages or conductor blowouts.

### 5.6.6 Cumulative Impacts

None expected, but will be investigated during the EIA Phase.

### 5.6.7 Specialist Studies Required

A Vegetation Assessment will be undertaken during the EIA Phase.



## 5.7 Fauna

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### 5.7.1 Data Collection

Information for the completion of this section was obtained from the following sources:

- Barnes, K.N. (1998). *The Important Bird Areas of southern Africa*. BirdLife South Africa: Johannesburg.
- Carruthers, V. (2000). *The Magaliesberg (2<sup>nd</sup> Ed)*. Pretoria: Protea Book House.
- Hokka, V. (2006). *Nature Surveys for Spatial Planning Using Integrated Environment Management (IEM) Guidelines. North West Environmental Management Series 9*. Mafikeng, South Africa: North West Provincial Government. 82 p.
- Department of Agriculture, Conservation and Environment, North West Provincial Government, (2007). *Magaliesberg Protected Environment: Environmental Management Framework And Plan*. South Africa: North West Provincial Government
- Yetman, C.A. (2004). *What you need to know about Bullfrogs*. Endangered Wildlife Trust. Giant Bullfrog Project.
- Skinner, J.D. & Smithers, R.H.N. (1990). *The Mammals of the Southern African Subregion*. Pretoria: University of Pretoria.
- Smithers, R.H.N. (1986). *South African Red Data Book-Terrestrial Mammals*. South Africa: South African National Scientific Programmes Report No.125: 1-214.

## 5.7.2 Regional Description

### 5.7.2.1 Mammals

Human activity in some sections of the study area is quite high, and it is unlikely that these areas will comprise significant habitat for any species of threatened larger mammals, except in the MPNE. According to the Magaliesberg Protected Environment: Environmental Management Framework and Plan - Status Quo Report (2007), Carruthers (2000) has recorded 90 indigenous mammal species in the Magaliesberg. The Sable Antelope (*Hippotragus niger*) is one of the mammal species which historically naturally occurred within the area that was re-introduced into the MPNE. According to Hokka (2006), the following species have been recorded in the MPNE (Table 13). Refer to Figure 13 which shows the MPNE in relation to the study area.

**Table 13: Red Data Mammal Species Recorded in the MPNE.**

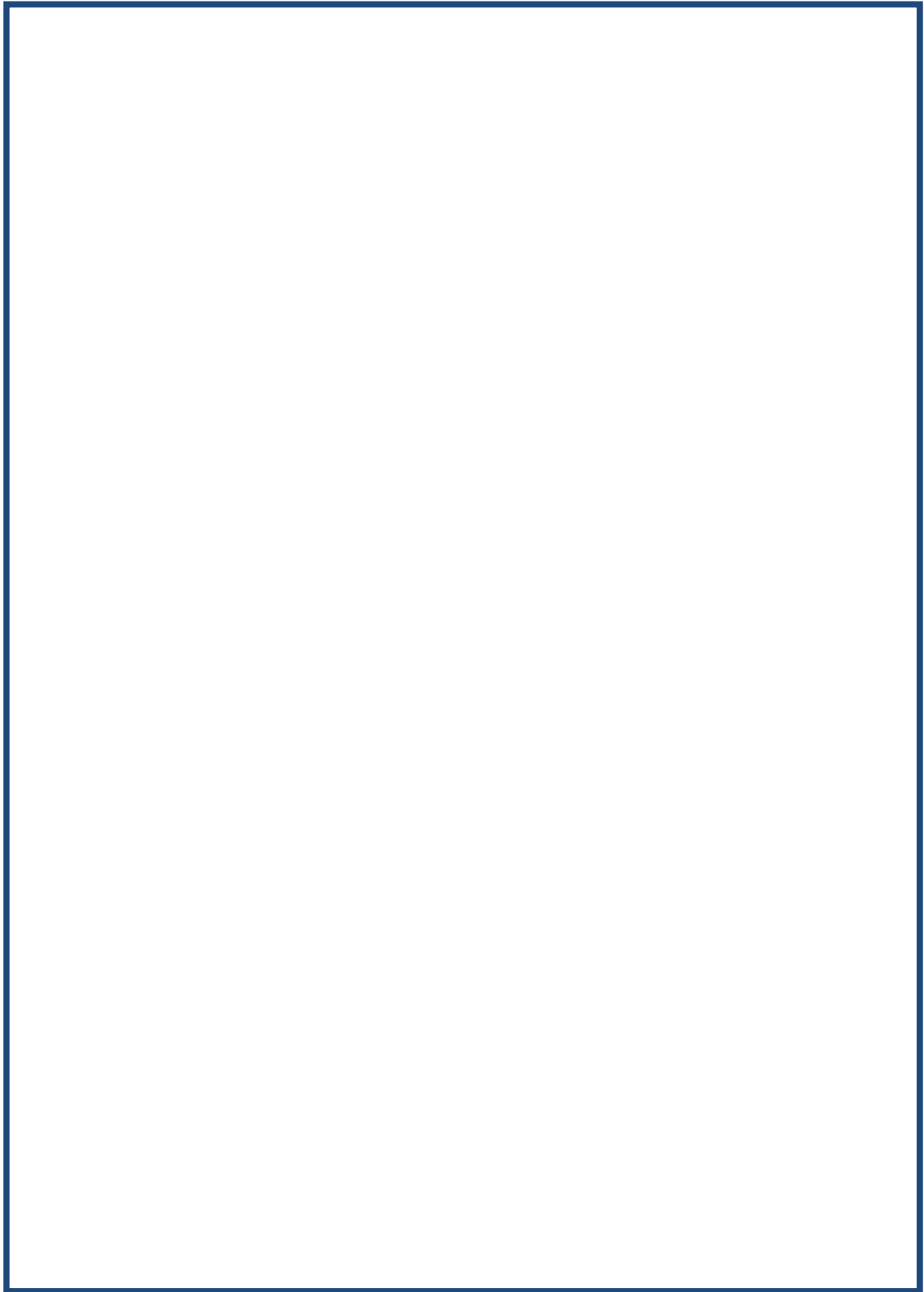
Species	Colloquial Names	Red Listed Status
<i>Suncus infinitesimus</i>	Least dwarf shrew	Indeterminate
<i>Atelerix frontalis</i>	South African hedgehog	Rare
<i>Proteles cristatus</i>	Aardwolf	Rare
<i>Hyaena brunnea</i>	Brown hyaena	Rare
<i>Panthera pardus</i>	Leopard	Rare
<i>Mellivora capensis</i>	Honey badger	Vulnerable
<i>Ourebia ourebi</i>	Oribi	Vulnerable

### 5.7.2.2 Avifauna

A list of bird species that could possibly occur within the study area is included in Appendix F. This list was adopted from the South African Bird Atlas Project (SABAP) from the Avian Demographic Unit (ADU), University of Cape Town. This list includes all the bird species recorded in grid cells 2527DB and 2527DD.






### 5.7.2.3 Reptiles

A list of reptile species that could possibly occur within the study area is included in Table 14. This list was adopted from the South African Reptile Conservation Assessment (SARCA), from the Avian Demographic Unit (ADU), University of Cape Town. This list includes all the reptile species recorded in grid cells 2527DB and 2527DD.



**Figure 12: MPNE Boundary vs Study Area**

Table 14: Reptiles Occuring in the Study Area 2527DB and 2527DD (SARCA).

Family	Common name	Species	Picture
Gekkonidae	Common Tropical House Gecko	<i>Hemidactylus mabouia</i>	
Colubridae	Rhombic Egg-eater	<i>Dasypeltis scabra</i>	
Viperidae	Rhombic Night Adder	<i>Causus rhombeatus</i>	
Gekkonidae	Transvaal Gecko	<i>Pachydactylus affinis</i>	
Testudinidae	Speke's Hinged Tortoise	<i>Kinixys spekii</i>	

#### 5.7.2.4 Amphibians

According to The North West Biodiversity Site Inventory and Database Development (2003), the following Red Data amphibians are recorded for the North West Province (Table 15).

Table 15: Red Data Herpetofauna Species Recorded for the North West Province.








Scientific name	English name	Status
<i>Crocodylus niloticus</i>	Nile Crocodile	Vulnerable
<i>Pyxicephalus adspersus</i>	Giant Bullfrog	Near Threatened







Due to the occurrence of various water bodies in the study area, the Giant Bullfrog is adapted to opportunistic breeding in pans and rainwater pools. According to Yetman (2004), the Giant Bullfrog is listed as "Near-Threatened" in Southern Africa and is considered a flagship species for southern African grasslands. There is also reason to believe that this species may be far more threatened within the sub-region, where Giant Bullfrogs are suffering a precipitous decline due to industrial and urban development. Although the destruction, degradation and fragmentation of grasslands and wetlands contribute the most to the decline of the Giant Bullfrog, the high mortality of these frogs on roads (usually at night after heavy thunder showers) is also of great concern.










5.7.2.5 Invertebrates

A list of butterflies that could possibly occur within the study area is included in Table 16. This list was adopted from the South African Butterfly Conservation Assessment (SABCA), from the Avian Demographic Unit (ADU), University of Cape Town.

**Table 16: Butterflies Occurring in the Study Area 2527DB and 2527DD (SABCA)**








Family	Common name	Species	Picture
Papilionidae	Green-banded swallowtail	<i>Papilio nireus lyaeus</i>	
Nymphalidae	African monarch, Plain tiger	<i>Danaus chrysippus orientis</i>	
Nymphalidae	Common diadem	<i>Hypolimnas misippus</i>	
Pieridae	Common dotted border	<i>Mylothris agathina agathina</i>	
Nymphalidae	Yellow pansy	<i>Junonia hierta cebrene</i>	
Nymphalidae	Garden commodore	<i>Precis archesia archesia</i>	
Nymphalidae	Painted lady	<i>Vanessa cardui</i>	

Family	Common name	Species	Picture
Papilionidae	Citrus swallowtail	<i>Papilio demodocus demodocus</i>	
Pieridae	African migrant	<i>Catopsilia florella</i>	
Hesperiidae	Two-pip policeman	<i>Coeliades pisistratus</i>	
Pieridae	Brown-veined white	<i>Belenois aurota aurota</i>	
Lycaenidae	Henning's black-eye	<i>Leptomyrina henningi</i>	
Lycaenidae	Apricot playboy	<i>Deudorix dinochares</i>	
Lycaenidae	Common geranium bronze	<i>Cacyreus marshalli</i>	
Pieridae	Brown-veined white	<i>Belenois aurota aurota</i>	
Nymphalidae	Wandering donkey acraea	<i>Acraea neobule neobule</i>	

Family	Common name	Species	Picture
Nymphalidae	Spotted sailor	<i>Neptis saclava marpessa</i>	
Pieridae	African migrant	<i>Catopsilia florella</i>	
Hesperiidae	Morant's orange	<i>Parosmodes morantii morantii</i>	
Nymphalidae	African leopard	<i>Phalanta phalantha aethiopica</i>	
Nymphalidae	Blue pansy	<i>Junonia oenone oenone</i>	
Lycaenidae	Common fig tree blue	<i>Myrina silenus ficedula</i>	
Pieridae	Broad-bordered grass yellow	<i>Eurema brigitta brigitta</i>	
Nymphalidae	White-barred charaxes	<i>Charaxes brutus natalensis</i>	
Lycaenidae	Eastern scarlet	<i>Axiocerses tjoane tjoane</i>	

Family	Common name	Species	Picture
Lycaenidae	Common zebra blue	<i>Leptotes pirithous</i> <i>pirithous</i>	
Lycaenidae	Grass jewel	<i>Chilades trochylus</i>	
Nymphalidae	Eyed pansy	<i>Junonia orithya</i> <i>madagascariensis</i>	
Lycaenidae	Cupreous blue	<i>Eicochrysops</i> <i>messapus</i> <i>mahallakoena</i>	
Lycaenidae	Black pie	<i>Tuxentius melaena</i> <i>melaena</i>	
Lycaenidae	Apricot playboy	<i>Deudorix dinochares</i>	
PIERIDAE	Twin dotted border	<i>Mylothris rueppellii</i> <i>haemus</i>	
Lycaenidae	African grass blue	<i>Zizeeria knysna</i>	
NYMPHALIDAE	Eyed bush brown	<i>Heteropsis perspicua</i> <i>perspicua</i>	



Family	Common name	Species	Picture
PIERIDAE	Broad-bordered grass yellow	<i>Eurema brigitta brigitta</i>	
HESPERIIDAE	Scarce ranger	<i>Kedestes nerva nerva</i>	
NYMPHALIDAE	African leopard	<i>Phalanta phalantha aethiopica</i>	
NYMPHALIDAE	Dancing acraea	<i>Telchinia serena</i>	
PIERIDAE	Smoky orange tip	<i>Colotis euipe omphale</i>	
PIERIDAE	African common white	<i>Belenois creona severina</i>	
HESPERIIDAE	Dark hottentot	<i>Gegenes pumilio gambica</i>	
LYCAENIDAE	Tiny grass blue	<i>Zizula hylax</i>	
NYMPHALIDAE	African monarch, Plain tiger	<i>Danaus chrysippus orientis</i>	
LYCAENIDAE	Common meadow blue	<i>Cupidopsis cissus cissus</i>	

Family	Common name	Species	Picture
LYCAENIDAE	Hintza pierrot	<i>Zintha hintza hintza</i>	
HESPERIIDAE	Dark hottentot	<i>Gegenes pumilio gambica</i>	
LYCAENIDAE	Trimen's sapphire	<i>Iolus trimeni</i>	
LYCAENIDAE	Common woolly legs	<i>Lachnocnema bibulus</i>	
LYCAENIDAE	Common black-eye	<i>Leptomyrina gorgias gorgias</i>	
NYMPHALIDAE	Pearl spotted charaxes	<i>Charaxes jahlusa rex</i>	
NYMPHALIDAE	Spotted joker	<i>Byblia ilithyia</i>	

### 5.7.3 Site Description

The Magaliesberg Protected Natural Environment (MPNE), which forms part of the study area, provides large areas where species such as hyena and leopard can exist. Caves are known to be found in the MPNE, and they are very important as roosting or breeding sites for bats and other animal species and should be conserved in its natural state.

In terms of Avifauna, the study area falls within the Magaliesberg and Witwatersberg (ZA018) Important Bird Area (IBA) (Barnes, 1988).

This large area includes the magisterial districts of the former Bophuthatswana, Brits, Rustenburg, Swartruggens, Ventersdorp, Koster and Oberholzer. The Magaliesberg range extends in an arc from just south of Rustenburg in the west to Hartbeespoort Dam near Pretoria in the east. Most of the area falls within the MPNE. Within the IBA, several publicly owned protected areas occur. The Diepsloot Nature Reserve, controlled by the Johannesburg Municipality, lies 10 km south of Hartbeespoort Dam. Other protected areas within the IBA include Rustenburg Nature Reserve, which is 2 km south-west of the town, Mountain Sanctuary Park and Hartbeespoort Dam Nature Reserve as well as several private reserves and conservancies. According to Wesson (2006), total 46.6% of the bird species recorded for southern African subregion (including Botswana, Lesotho, Mozambique south of the Zambesi River, Namibia, South Africa, Swaziland and Zimbabwe) have been recorded from the Magaliesberg.

According to Carruthers (2000), the MPNE is ideal for a high diversity of reptiles especially among the rocks, cliffs and crevices and the substrate is an important factor in determining which habitats will be suitable for particular reptile species. Reptiles that are present in the Magaliesberg, ranging from poisonous snakes to agamas and skinks have been recorded by Carruthers (2000). The rivers in the study area provide an ideal habitat for amphibians to occur.

According to Hokka (2006), a total of 140 butterfly species were identified for the MPNE, while Two 221 species of butterfly have been confirmed to occur in the North West Province. This implies that 63% of the butterfly species that occur in the North West Province have been recorded in the MPNE.

### 5.7.4 Environmental Issues

The proposed powerline alternatives traverse the Magaliesberg (therefore the Magaliesberg Protected Environment) as well as the Witwatersberg. Many diverse habitats occur within the study area, and sensitive or Red or Orange Data Faunal, Herpetofaunal and Avifaunal species could occur within the study area. There is however existing linear impacts in the study area such as roads, powerlines and railway lines.

### 5.7.5 Potential Impacts

Potential impacts which could occur during the construction phase include the following:

- Habitat loss due to vegetation clearing within servitude, vegetation destruction at tower footings, and trimming and cutting down of trees.

Potential impacts which could occur during the operational phase:

- Bird fatalities due to collision with powerlines;
- Damage to habitat due to movement of maintenance vehicles on vegetated areas; and
- Habitat destruction due to risk of Veld fires as a result of line shortages or conductor blowouts.

### 5.7.6 Cumulative Impacts

None expected but will be investigated during the EIA Phase.

### 5.7.7 Specialist Studies Required

A Faunal and Avifaunal Assessment will be undertaken during the EIA Phase. Due to the occurrence of butterflies, reptiles and herpetofauna within the MPNE the following specialist studies are also recommended:

- Invertebrate Assessment; and
- Herpetological Assessment.

## 5.8 Surface Water

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### 5.8.1 Data Collection

- Walmsley, D., and Walmzley, J (Mzuri Consultants, Pretoria) & Mangold, S., and Kalule-Sabiti, M.(Directorate Environment & Conservation North West Department of Agriculture, Conservation and Environment) (2002). *North West Province State of the Environment Report*. Available from: <http://www.environment.gov.za/soer/reports/northwest>
- Greater Pretoria Metropolitan Council. (2001). *Pretoria State of the Environment Report*. Available from: <http://www.ceroi.net/reports/pretoria/issues.htm>
- Gauteng Department of Agriculture and Rural Development. (2004). *Gauteng State of the Environment Report*. Available from: <http://www.environment.gov.za/soer/reports/gauteng.html>
- North West Province Environment Outlook: A Report on the State of the Environment (2008). Available From:

[http://www.nwpg.gov.za/Agriculture/NW\\_ENVIRONMENTAL\\_OUTLOOK/chapter.asp?CHAPTER=0&PAGE=10&TITLE=Foreword](http://www.nwpg.gov.za/Agriculture/NW_ENVIRONMENTAL_OUTLOOK/chapter.asp?CHAPTER=0&PAGE=10&TITLE=Foreword)

- South African National Biodiversity Institute. 2005. Protected areas of South Africa, Lesotho and Swaziland. SANBI, Cape Town.

### 5.8.2 *Regional Description*

The North West Province is situated within the Crocodile West - Marico Water Management Area (WMA 3) which borders on Botswana. This WMA includes two major river systems, the Crocodile and Groot Marico, which give rise to the Limpopo River at their confluence. Surface water in the North West Province occurs in the form of rivers, dams, pans, wetlands, as well as dolomitic eyes which is fed by aquifers. In the semi-arid western portion of the province surface water resources are generally scarce. The main rivers in the province include the Crocodile, Groot Marico, Hex, Elands, Vaal, Mooi, Harts and Molopo rivers. There are over 40 wetland areas in the province of which one, the Barbers Pan, is a Ramsar site (recognised as a wetland of international importance).

Surface water runoff from precipitation in the North West Province ranges from less than 1% in the semi-arid western area to approximately 7% in the eastern region, with the average runoff being 6% which is below the national average of 9%. In order to meet water supply needs, the North West Province relies heavily on ground water resources.

Surface waters in the Gauteng Province comprise both flowing rivers and lakes or dams, with many of the smaller tributaries being seasonal in nature (i.e. dry in the winter). The Gauteng Province is situated within the upper reaches of three water management areas (WMAs). These WMAs includes the Crocodile West-Marico, Upper Vaal and Olifants River areas. Gauteng's natural water resources comes from surface water runoff as well as from ground water, however due to the high demand for water in the province, raw water is imported from outside the province. The province's main water supply comes from the Vaal River which receives input from the Lesotho Highlands Project. The main rivers and streams in the Tshwane (Pretoria) area are the Apies River, the Pienaars River and the Moreleta spruit. Approximately 2.1% of surface area in Pretoria is covered by wetlands. Figure 13 below shows the rivers found within the study area.

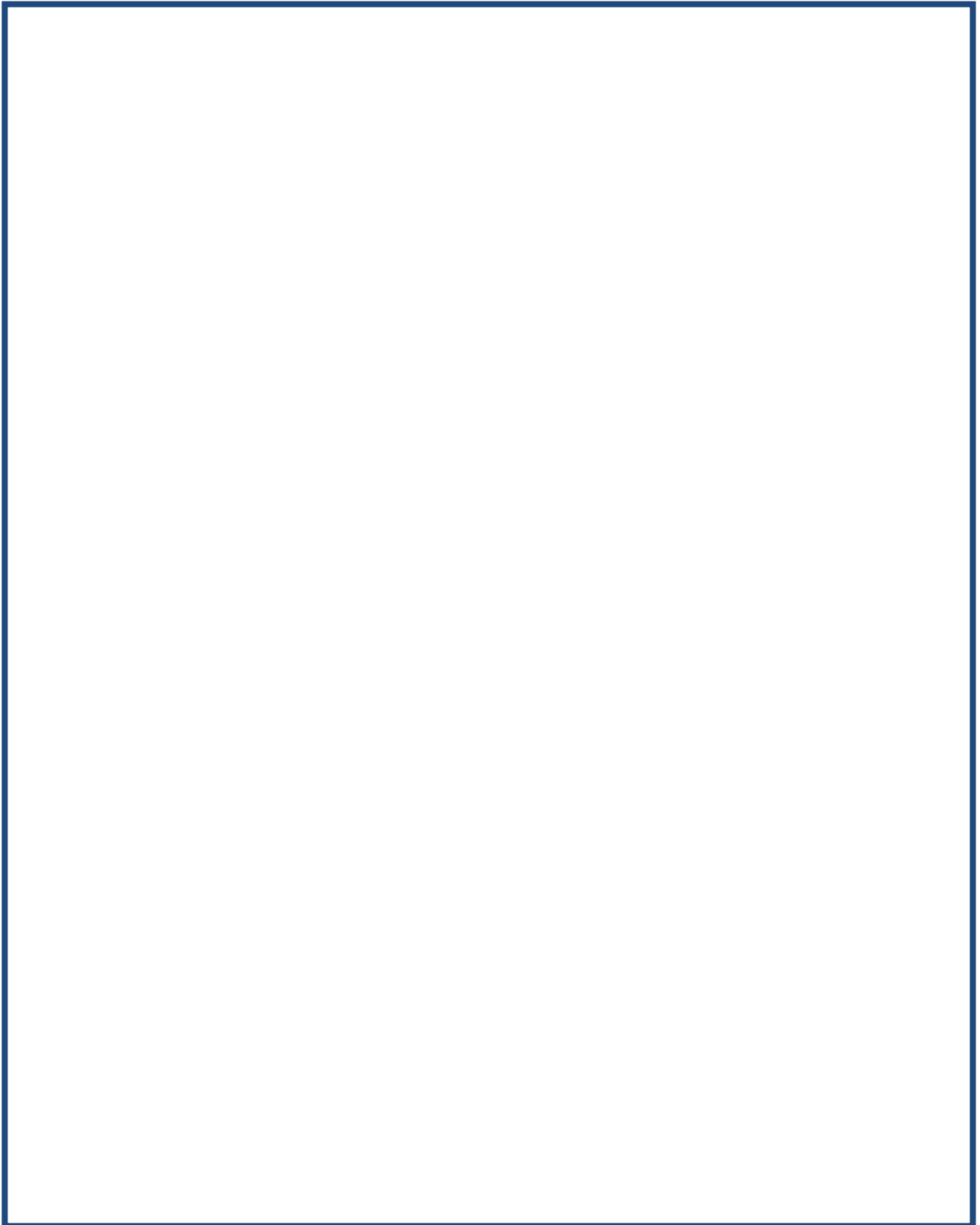


Figure 13: Rivers found within the study area

### 5.8.3 Site Description

The proposed alternative powerlines traverse various watercourses and associated riparian areas. Some wetland areas may also occur within the study area. Based on the 1:50 000 topographic maps as obtained from the surveyor general, it is not clear whether wetland areas occur within the study area, this will however be investigated during the EIA Phase. Streams in the area include many tributaries of the Crocodile River, as well as the Swartspruit, the Moganwe River, as well as many unnamed tributaries.

### 5.8.4 Environmental Issues

Various watercourses occur within the study area. The proposed powerline may traverse many of these watercourses and associated riparian areas.

### 5.8.5 Potential Impacts

Waste generated during the construction phase may enter the environment through surface water runoff i.e. litter or pollution such as hydrocarbons can be washed into aquatic systems affecting those systems negatively. Storm water flowing over the construction site and cleared servitude will also mobilise loose sediments, which may enter the surface water environment affecting water quality. Storm water can also be contaminated from concrete batch plants, construction camps, by vehicle wash-down pads, by sewerage from employee ablutions, by excess fertiliser from rehabilitated areas, etc.

As mentioned previously, powerlines can span over a maximum distance of between 350m-550m on a relatively flat terrain. It may not always be possible to span the powerline over watercourses without erecting a pylon within the riparian area, or spanning over a wetland area without erecting a pylon within the wetland buffer area. Should it become necessary to erect pylons within these sensitive area, a Water Use License will be required as well as several specialist studies as detailed below in Section 5.8.7.

Minimal impacts to surface water features are expected during the operational phase. However, this will be further investigated during the EIA Phase.

### 5.8.6 Cumulative Impacts

None expected but will be investigated during the EIA Phase.

### 5.8.7 Specialist Studies Required

A Floodline Delineation study as well as a Wetland Delineation and Wetland Ecological Assessment will be required should it not be possible to span the powerlines to avoid these areas.. This will however only be known once a final powerline route has been established, and therefore the findings of these studies will not form part of the EIA Report, but will be included in the Final Environmental Management Plan which will be submitted to DEA for approval prior to the commencement of construction activities. In recognition of the sensitivity of a watercourse and the protection of the powerline infrastructure, the pylon will preferably not encroach on the 1:100 year floodline.

## 5.9 Groundwater

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### 5.9.1 Data Collection

- Walmsley, D., and Walmzley, J (Mzuri Consultants, Pretoria) & Mangold, S., and Kalule-Sabiti, M.(Directorate Environment & Conservation North West Department of Agriculture, Conservation and Environment) (2002). *North West Province State of the Environment Report*. Available from: <http://www.environment.gov.za/soer/reports/northwest>
- Greater Pretoria Metropolitan Council. (2001). *Pretoria State of the Environment Report*. Available from: <http://www.cerol.net/reports/pretoria/issues.htm>
- Gauteng Department of Agriculture and Rural Development. (2004). *Gauteng State of the Environment Report*. Available from: <http://www.environment.gov.za/soer/reports/gauteng.html>

### 5.9.2 Regional Description

The fractured aquifers and dolomitic compartments which occur within the North West Province have resulted in a large reservoir of subterranean water. Although this precious resource occurs in the province, the recharge to this reservoir is considered to be one of the lowest in South Africa with an average of less than 10 mm per annum in the western region of the province. In order to meet water supply needs, the North West Province relies heavily on ground water resources. Groundwater resources in the province are polluted by mining and industrial activities, as well as by agriculture and domestic use. High levels of dissolved minerals, nitrates and fluoride concentrations in certain areas in the province as a result of both natural and human-induced factors are the main groundwater water quality issues in the province.



Due to the varied and complex geology of the Gauteng Province, aquifers found within this province are diverse. Four main types of aquifers occurs within the Gauteng Province. These aquifers are grouped into four hydrogeological types which includes intergranular (alluvial – found in valley bottoms); fractured aquifers; karstic (dolomitic) aquifers; and intergranular and fractured aquifers (in the weathered zone). The quality of water in these aquifers found in the Gauteng Province is highly variable depending on the geology, ecological setting and influence of man.

### 5.9.3 Site Description

In terms of the North West State of the Environment Report the groundwater storage rock types found within the study area is mainly comprised of fractured igneous rock/metamorphic rock and fractured compact sedimentary rock. No karstic aquifers occur within the study area. No dolomites occur along the section of the eastern route alternative which traverses the Tshwane Municipal area and therefore no karstic aquifers within the area.

### 5.9.4 Environmental Issues

There are no karstic aquifers located within the study area, and therefore there are no significant issues to report on.

### 5.9.5 Potential Impacts

Groundwater will not be abstracted to provide water during the construction phase of construction activities. There is a risk that storm water could become contaminated with hydrocarbons or oils during the construction phase.

### 5.9.6 Cumulative Impacts

None expected, but will be investigated during the EIA Phase.

### 5.9.7 Specialist Studies Required

None required.

## 5.10 Air Quality

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### 5.10.1 Data Collection

- Walmsley, D., and Walmzley, J (Mzuri Consultants, Pretoria) & Mangold, S., and Kalule-Sabiti, M.(Directorate Environment & Conservation North West Department of Agriculture, Conservation and Environment) (2002). *North West Province State of the Environment Report*. Available from: <http://www.environment.gov.za/soer/reports/northwest>
- Greater Pretoria Metropolitan Council. (2001). *Pretoria State of the Environment Report*. Available from: <http://www.ceroi.net/reports/pretoria/issues.htm>
- Gauteng Department of Agriculture and Rural Development. (2004). *Gauteng State of the Environment Report*. Available from: <http://www.environment.gov.za/soer/reports/gauteng.html>

### 5.10.2 Regional Description

Air quality in the majority of the North West Province is not considered to be a major problem. Areas where air quality in the province shows deterioration includes urban, mining and industrialised areas such as Brits, Rustenburg and Potchefstroom. Vehicular emissions in the urbanised and industrialised areas also contribute to a deterioration in air quality in the province. Furthermore the use of wood and coal for heating and cooking purposes in informal areas contributes to poorer air quality.

The state of air quality in the Pretoria (Tshwane) area is influenced by industrial activities, petrol stations, vehicular emissions from nearby roads and highways, informal settlements, sewerage effluent, and waste dumping. All of these activities contribute to air emissions which deteriorates air quality in the area.

### 5.10.3 Area/Local Description

Land uses in the study area are comprised of many minor and major roads, agriculture, mining, conservation, industrial, commercial, recreational and residential. Emissions from mining activities, industrial activities as well as and vehicular emissions affects the status of air quality in the study area. Furthermore various informal settlements occur and air emissions as a result of coal and wood burning for heating and cooking purposes also impacts on the state of air quality in the study area.

#### 5.10.4 Environmental Issues

There are no significant issues to Report on.

#### 5.10.5 Potential Impacts

Dust generation from stockpiles and soil stripping and vegetation clearing from the servitude during the construction phase, as well as vehicle traffic on dirt roads and construction vehicle fumes will have an impact on air quality. The powerline itself will not have an impact on air quality during the operational phase, however, this project forms part of the Medupi integration project and coal burning activities at the new Medupi power station for electricity generation may impact on air quality on a provincial and possibly also a national scale.

#### 5.10.6 Cumulative Impacts

The potential air quality impacts which could result from activities undertaken during the construction phase of the proposed project will not be significantly different to the air quality impacts already occurring in the study area, and is not expected to have a significant increase to overall impact already occurring in the area. Power generation at the Medupi power station will contribute to the release of greenhouse gasses into the atmosphere which may contribute to national and international air quality impacts.

#### 5.10.7 Specialist Studies Required

No specialist studies recommended. Impact on air quality as part of the Medupi power station would have been assessed and addressed in the EIA which was undertaken for the power station.

### **5.11 Noise**

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#### 5.11.1 Data Collection

Observations made during site visit undertaken.

### 5.11.2 Area/Local

As mentioned previously, land uses in the study area are comprised of many minor and major roads, agriculture, mining, conservation, industrial, commercial, recreational and residential. Noise levels in the study area are currently generated by vehicles traffic on the major and minor roads, by heavy vehicles used by the mines and industries in the area, as well as by operational activities undertaken by the mines, quarries and industries. There are various properties which is not located in close proximity to mining and industrial area, where noise levels are lower.

### 5.11.3 Environmental Issues

Noise impact may result during the construction and operational phases of the proposed development.

### 5.11.4 Potential Impacts

During the construction phase, the operation of machinery and equipment, as well as the construction vehicle traffic will create a noise impact. Where a helicopter will be used for the stringing of the conductors and cables noise impact will be created. During the operational phase, limited noise impact is created by the flow of the high voltage electricity through the powerlines, however this noise is only heard when standing underneath the powerline.

### 5.11.5 Cumulative Impacts

The construction and operational phases of the proposed powerline is expected to have a low cumulative impact on the noise levels in the study area.

### 5.11.6 Specialist Studies Required

None required.

## 5.12 Visual

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### 5.12.1 Data Collection

Observations made during a site visit undertaken, and images obtained from Google Earth.

### 5.12.2 Area/Site Description

As mentioned in Section 5.1.2, the North West Province has one of the most uniform terrains of all South African Provinces with altitudes ranging from between 920-1782 metres above mean sea level (mamsl). The eastern part of the province is mountainous and includes the scenic Magaliesberg, while the western and central parts of the province is characterised by gently undulating plains. The surface topography of the area within the Gauteng Province which the proposed eastern route alternative will traverse is described as a rugged landscape with hills and slopes of the Magaliesberg and the Witwatersberg. Approximately 20 ridges occur in the Tshwane (Pretoria) area, of which the most sensitive ridges include the Bronberge, The Magaliesberg, Daspoort, Meintjieskop, Tuine Bult Koppies and the Witwatersberg

Land uses in the study area which causes an existing visual impact includes the mines and quarries, various industries, Pelindaba, the Nuclear Energy Regulator of South Africa (NECSA) and existing powerline infrastructure.

### 5.12.3 Environmental Issues

Visual impact may result during the construction and operational phases of the proposed powerline.

### 5.12.4 Potential Impacts

The removal of vegetation and activities undertaken during the construction phase may have a negative visual impact on the adjacent land uses. The powerline will create a permanent visual impact during the operational phase. The impact is expected to only be viewed as a negative impact where it traverse the MPNE as well as areas where houses and tourism facilities occur. However, there are already existing powerline in the study area and there is an exiting powerline which traverse the MPNE.

#### 5.12.5 Cumulative Impacts

The proposed powerline will be an additional linear development in the area and will contribute to the overall visual impact caused by linear infrastructure.

#### 5.12.6 Specialist Studies Required

A Visual Impact Assessment will be undertaken during the EIA Phase.

### 5.13 Traffic

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#### 5.13.1 Data Collection

- Walmsley, D., and Walmzley, J (Mzuri Consultants, Pretoria) & Mangold, S., and Kalule-Sabiti, M.(Directorate Environment & Conservation North West Department of Agriculture, Conservation and Environment) (2002). *North West Province State of the Environment Report*. Available from: <http://www.environment.gov.za/soer/reports/northwest>

#### 5.13.2 Area/Site Description

Various major and minor roads occur within the study area. The N4 between Rustenburg and Pretoria runs through a portion of the study area. Little information is available on traffic volumes in the study area and whether major traffic issues occur. The North West Province has relatively good general infrastructure, including a roads, and a well developed network of tarred roads links the main urban centres in the Province. Many rural settlements in the province are serviced by gravel roads.

#### 5.13.3 Environmental Issues

No substantial issues to report on.

### 5.13.4 Potential Impacts

During the construction phase, construction vehicles will travel to and from the site delivering construction materials, which will have an impact on traffic volumes in the area. During the operational phase very little traffic impact is expected, as maintenance on the lines is undertaken at least once a year, and in the unfortunate event where a tower collapses or a conductor blows, heavy vehicles will be used for transportation of materials.

### 5.13.5 Cumulative Impacts

During the construction phase construction vehicles will result in additional vehicle traffic in the study area. There are already heavy mining vehicles travelling within some sections of the study area, and the heavy vehicles used for construction purposes of the powerline will increase the amount of heavy vehicles on the roads. This impact will however only occur during the construction phase.

### 5.13.6 Specialist Studies Required

None required.

## 5.14 **Socio-Economic Environment**

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### 5.14.1 Data Collection

Census 2001 data, obtained from the Statistics South Africa (STATS SA) website ([www.statssa.gov.za](http://www.statssa.gov.za)) was used to complete this section

### 5.14.2 Sub-Place Description

The proposed alternative powerlines and associated 1km study corridor are located within seven (7) sub-places in terms of the Census 2001 data. The sub-places and associated Local Municipality and Province are provided in the Table below (Table 15):

Table 17: Affected Sub-Places in terms of Census 2010

Sub-Place	Local Municipal Area	Province	Powerline Alternative Traversing the Sub-Place
Brits NU	Madibeng Local Municipality	North West	All alternatives
Rankotia	Madibeng Local Municipality	North West	Eastern Route Alternative
Ga-Rankuwa SP	Madibeng Local Municipality	North West	Eastern Route Alternative
Mothutlung	Madibeng Local Municipality	North West	Eastern Route Alternative
Pretoria NU	City of Tshwane Local Municipality	North West	Eastern Route Alternative
Magalies Nature Reserve SP	Madibeng Local Municipality	North West	Western Route Alternative
Damonsville	Madibeng Local Municipality	North West	Western Route Alternative

Census data on each of these Sub-Places is provided in the sections below.

#### 5.14.2.1 Brits NU

In 2001, according to the Census 2001 data, Brits NU had a total population of 34,930. Of this total population 76% were between the ages of 15-65 years, which is the age group classified by STATS SA as being “Economically Active”, and the remaining 24% of the population fell within the age group that is classified as “Not Economically Active”. Refer to Figure 14 below for a breakdown of the population by age, and to Figure 15 for an illustration of the “Economically Active” vs the “Not Economically Active” groups.

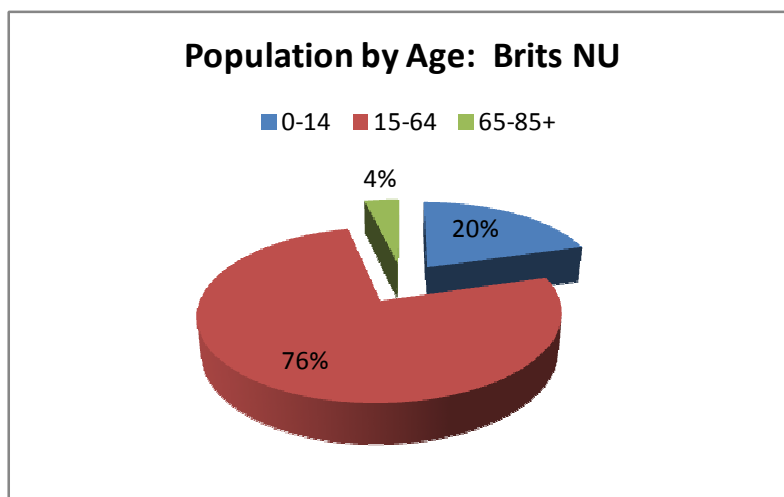
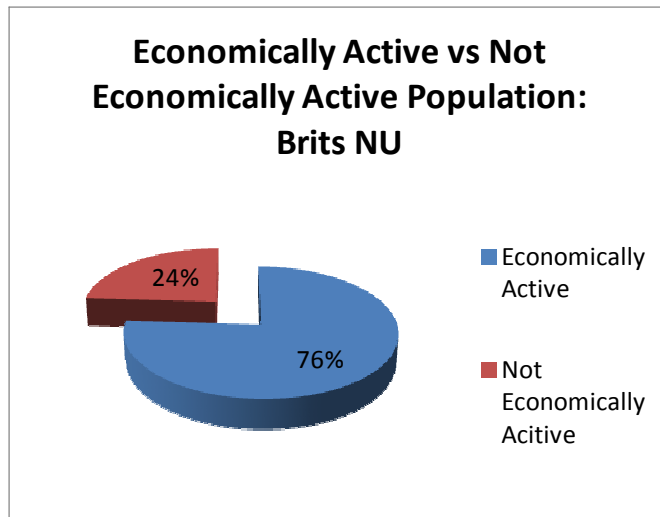


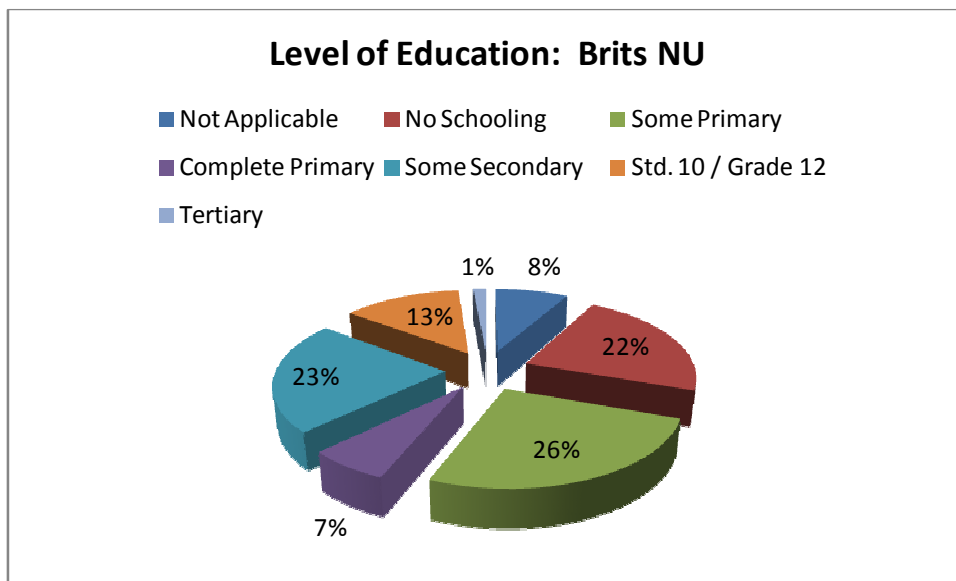
Figure 14: Total Population by Age – Brits NU





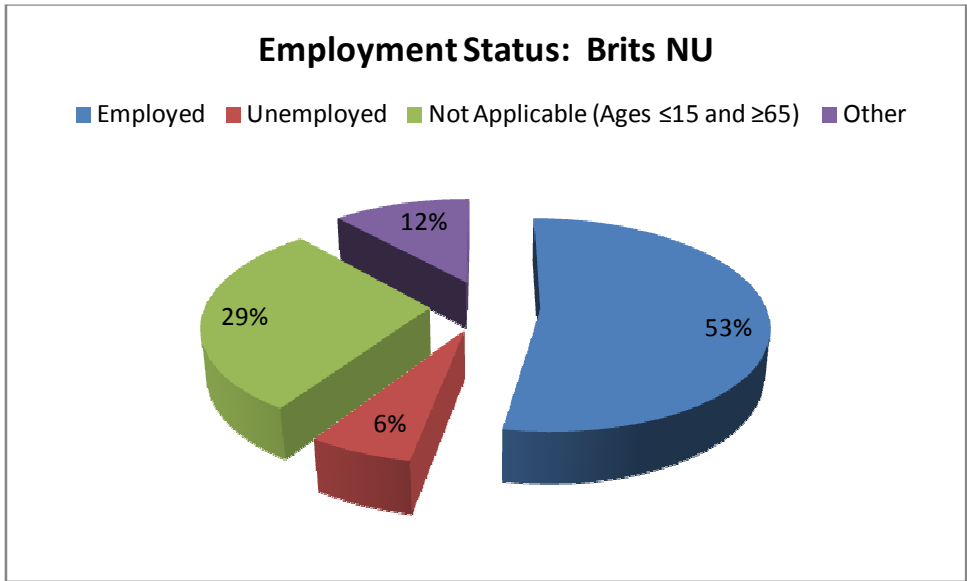
**Figure 15: Economically Active vs Not Economically Active – Brits NU**

During 2001, only 13.28% of the total population had a complete secondary education (Gr. 12 / Std. 10), and only 1.37% of the population had a tertiary education. Figure 16 below provides a breakdown of the total level of education for the 2001 population figures.



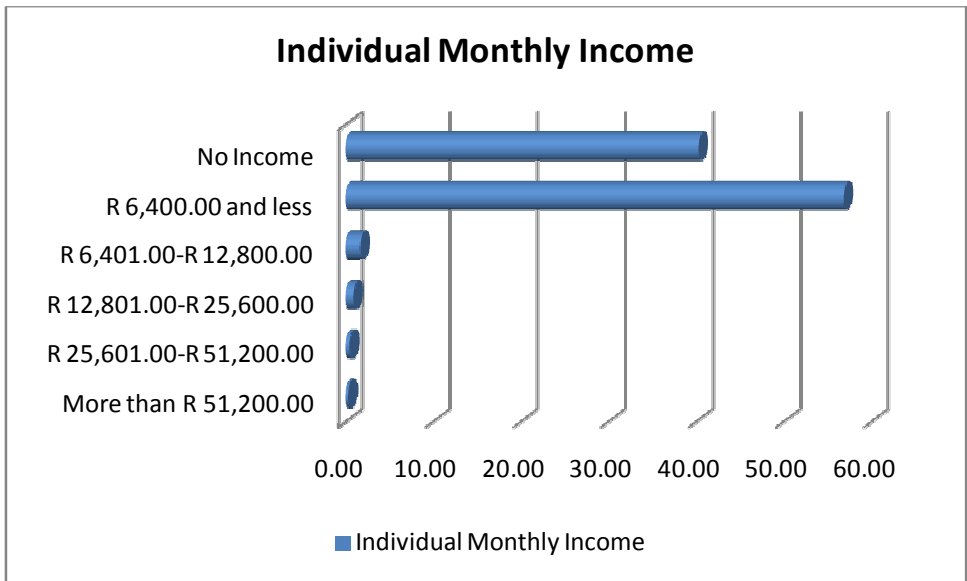
**Figure 16: Level of Education – Brits NU**

Of the total population, 53% were employed during 2001, 6% were unemployed, and 29% were not “Economically Active”. Figure 17 below provides a breakdown of the employment status of the total population during 2001.



**Figure 17: Employment Status – Brits NU**

The graph below (Figure 18) provides a breakdown of the average monthly income per individual during 2001. A total of 40.18% of the total population did not receive any form of income, and 56.72% earned R 6,400.00 or less.



**Figure 18: Average Monthly Income – Brits NU**

5.14.2.2 Rankotia

In 2001, according to the Census 2001 data, Rankotia had a total population of 531. Of this total population 64% were between the ages of 15-65 years, which is the age group classified by STATS SA as being “Economically Active”, and the remaining 36% of the population fell within the age group that is classified as “Not Economically Active”. Refer to Figure 19 below for a breakdown of the population by age, and to Figure 20 for an illustration of the “Economically Active” vs the “Not Economically Active” groups.

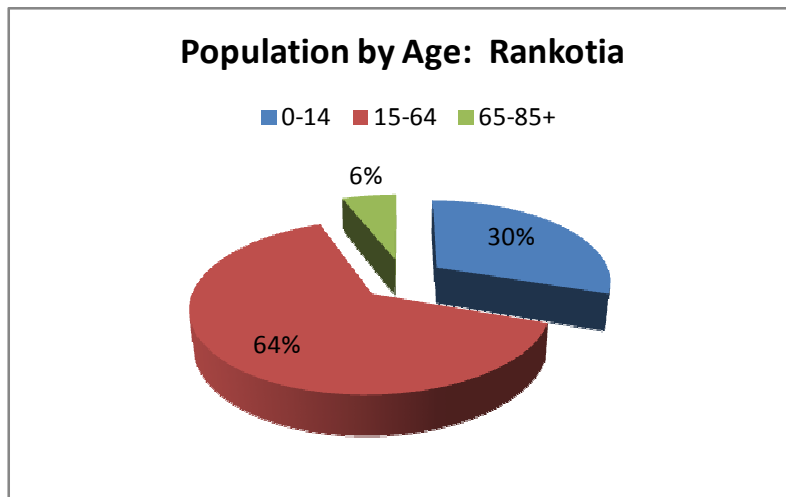


Figure 19: Total Population by Age – Rankotia

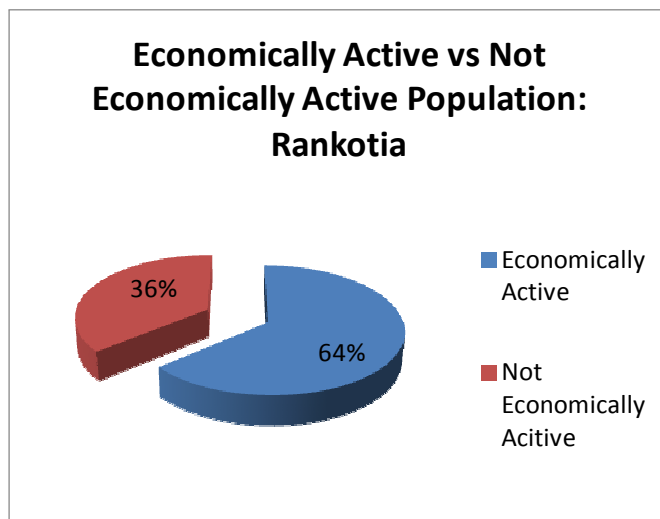


Figure 20: Economically Active vs Not Economically Active – Rankotia

During 2001, only 13.30% of the total population had a complete secondary education (Gr. 12 / Std. 10), and 0% of the population had a tertiary education. Figure 21 below provides a breakdown of the total level of education for the 2001 population figures.

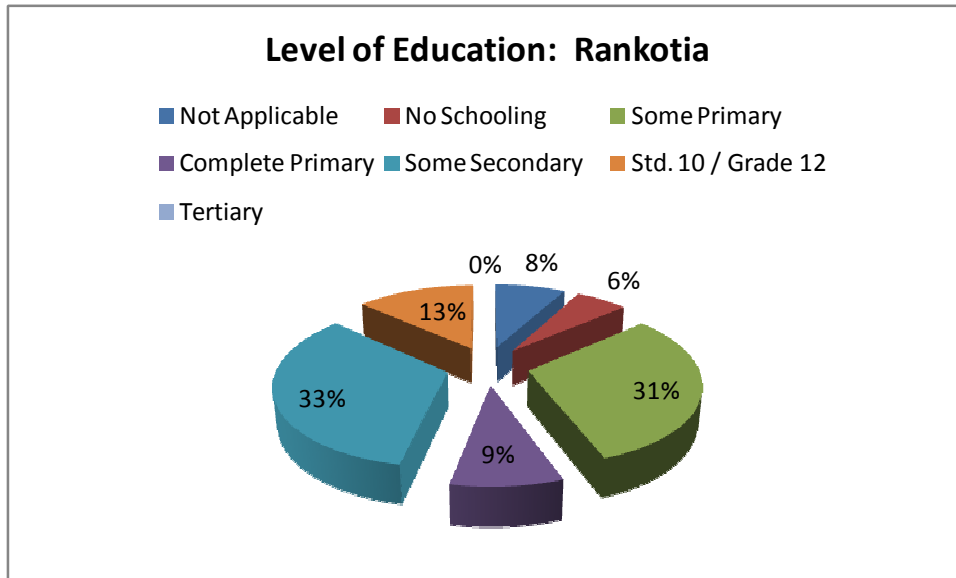


Figure 21: Level of Education - Rankotia

Of the total population, 18% were employed during 2001, 29% were unemployed, and 49% were not “Economically Active”. Figure 22 below provides a breakdown of the employment status of the total population during 2001.

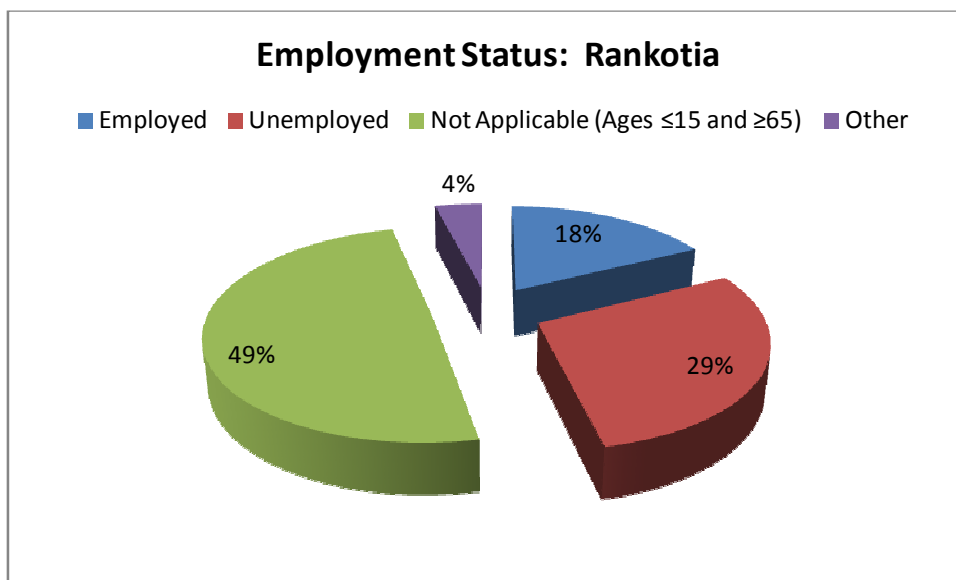
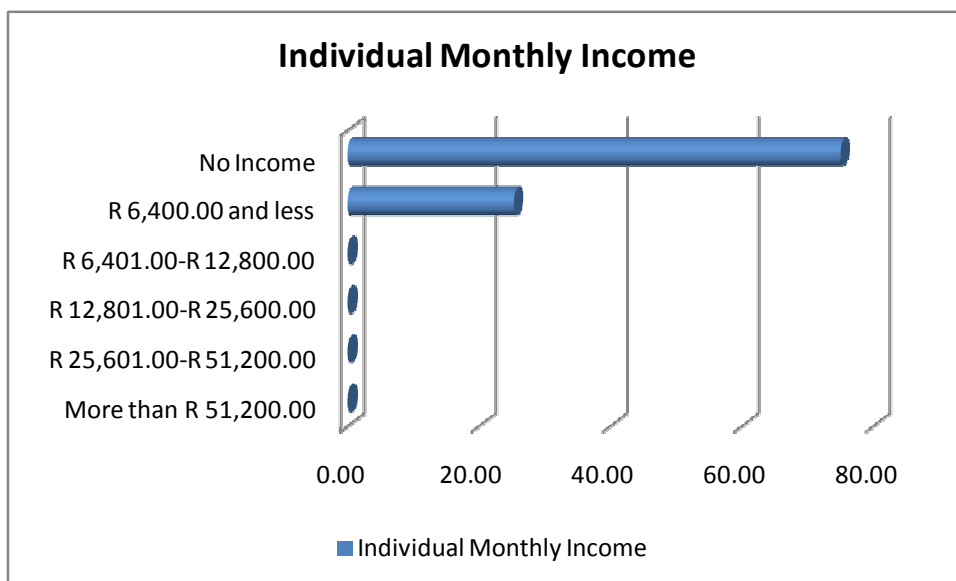


Figure 22: Employment Status – Rankotia

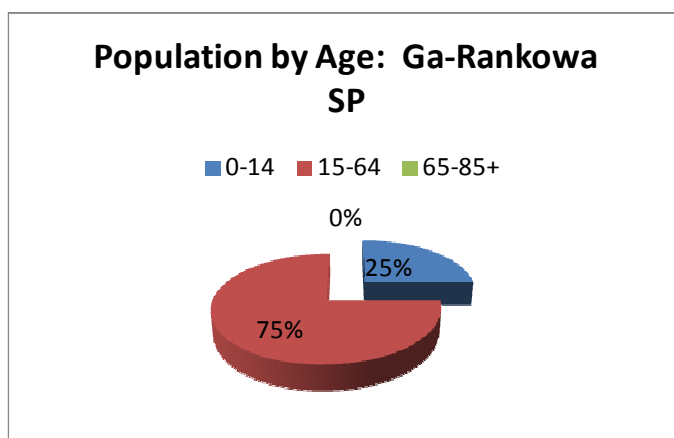
The graph below (Figure 23) provides a breakdown of the average monthly income per individual during 2001. A total of 74.81% of the total population did not receive any form of income, and 25.19% earned R 6,400.00 or less.



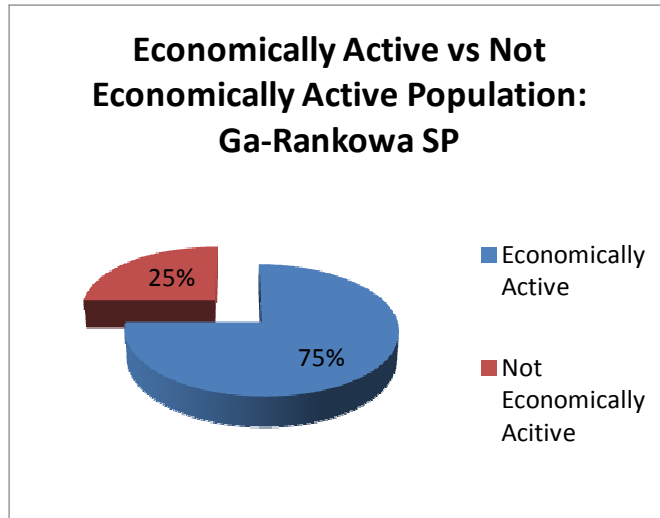
**Figure 23: Average Monthly Income - Rankotia**

5.14.2.3 Ga-Rankuwa SP

In 2001, according to the Census 2001 data, Ga-Rankuwa SP had a total population of 12. Of this total population 75% were between the ages of 15-65 years, which is the age group classified by STATS SA as being “Economically Active”, and the remaining 25% of the population fell within the age group that is classified as “Not Economically Active”. Refer to Figure 24 below for a breakdown of the population by age, and to Figure 25 for an illustration of the “Economically Active” vs the “Not Economically Active” groups.

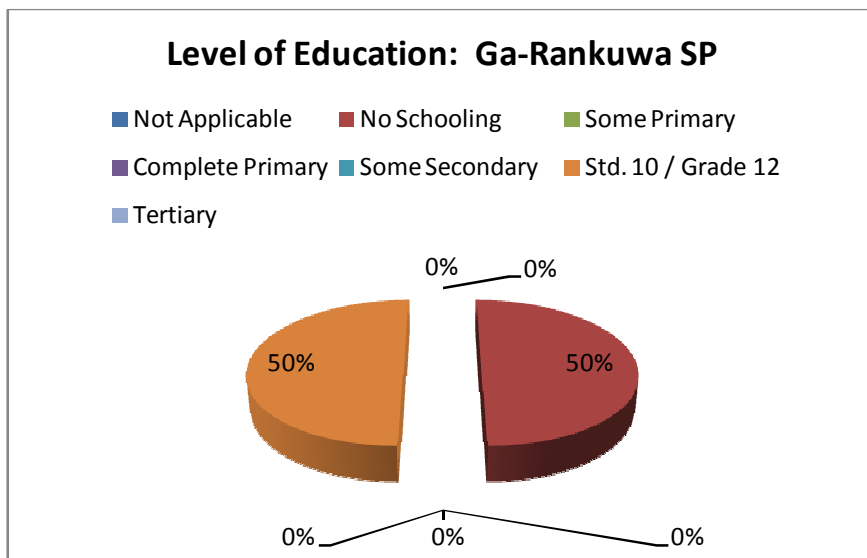


**Figure 24: Total Population by Age – Ga-Rankuwa SP**



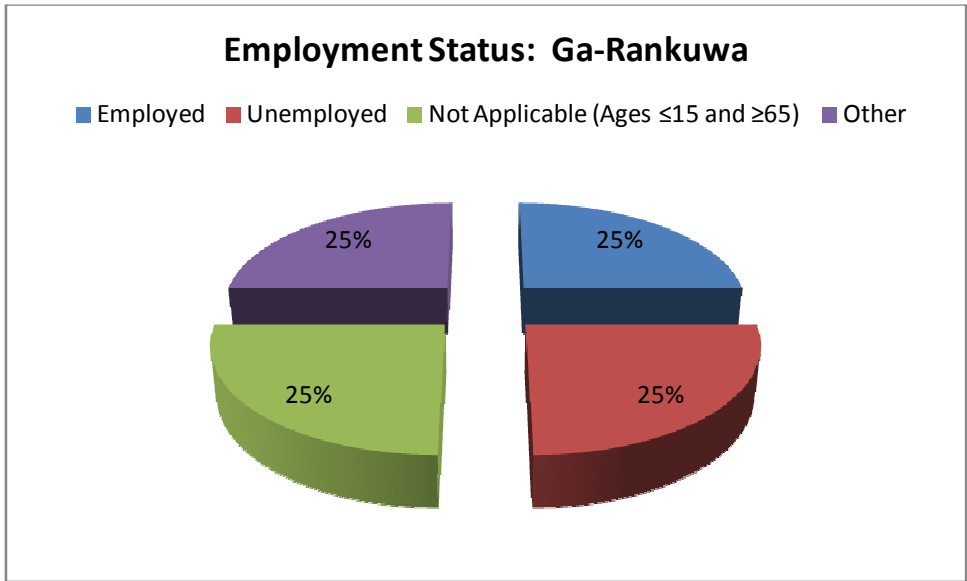
**Figure 25: Economically Active vs Not Economically Active – Ga-Rankuwa SP**

During 2001, only 50% of the total population had a complete secondary education (Gr. 12 / Std. 10), and 50% of the population had no form of schooling. Figure 26 below provides a breakdown of the total level of education for the 2001 population figures.



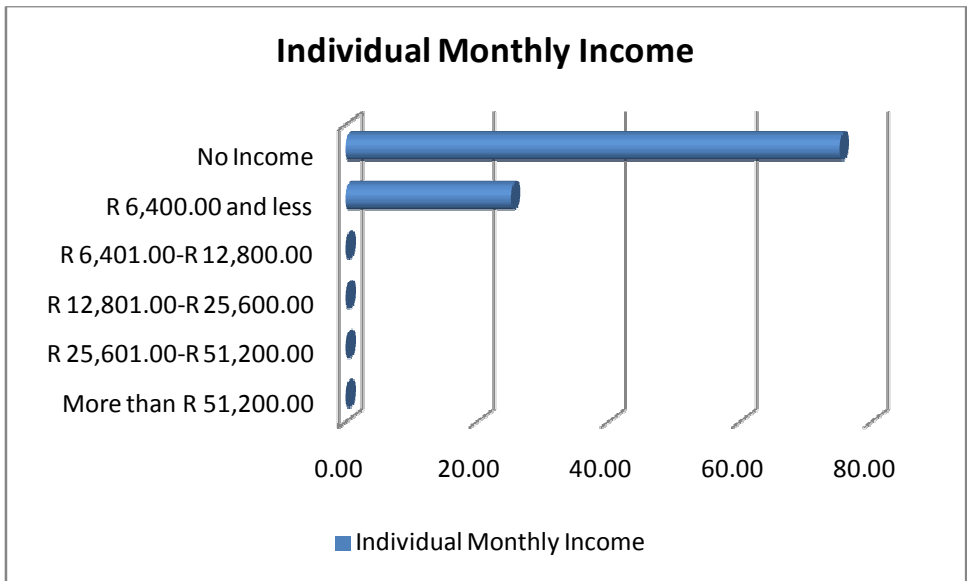
**Figure 26: Level of Education – Ga-Rankuwa SP**

Of the total population, 25% were employed during 2001, 25% were unemployed, and 25% were not “Economically Active”. Figure 27 below provides a breakdown of the employment status of the total population during 2001.



**Figure 27: Employment Status – Ga-Rankuwa SP**

The graph below (Figure 28) provides a breakdown of the average monthly income per individual during 2001. A total of 75% of the total population did not receive any form of income, and 25% earned R 6,400.00 or less.



**Figure 28: Average Monthly Income – Ga-Rankuwa SP**

5.14.2.4 Mothutlung

In 2001, according to the Census 2001 data, Mothutlung had a total population of 11,312. Of this total population 68% were between the ages of 15-65 years, which is the age group classified by STATS SA as being “Economically Active”, and the remaining 32% of the population fell within the age group that is classified as “Not Economically Active”. Refer to Figure 29 below for a breakdown of the population by age, and to Figure 30 for an illustration of the “Economically Active” vs the “Not Economically Active” groups.

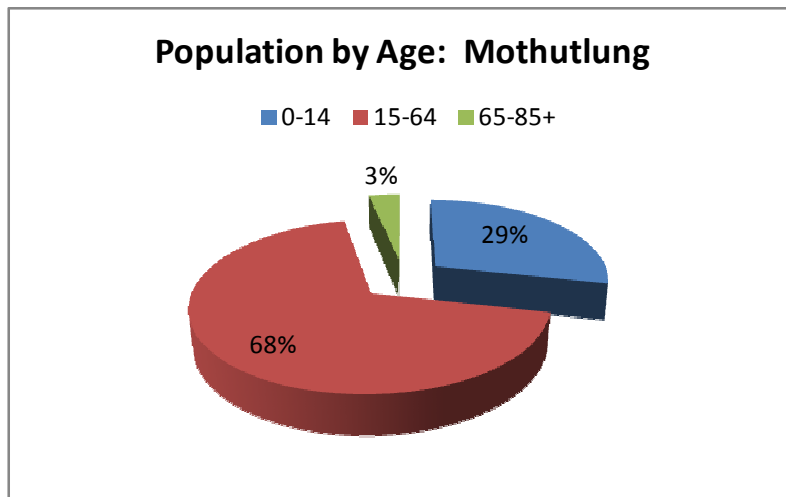


Figure 29: Average Monthly Income – Mothutlung

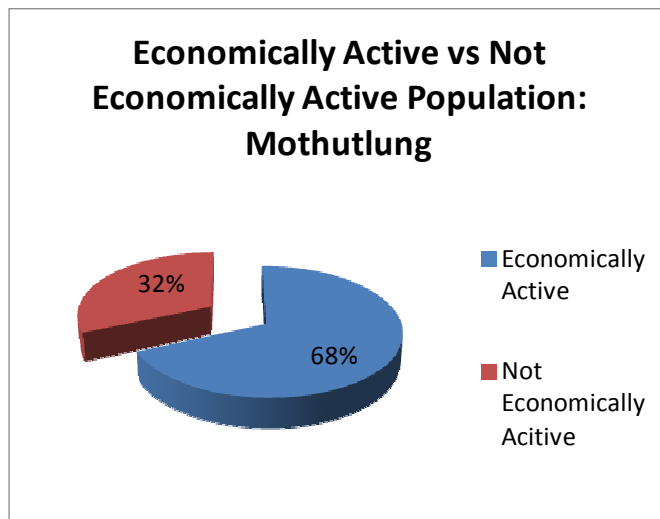


Figure 30: Economically Active vs Not Economically Active – Mothutlung



During 2001, only 25% of the total population had a complete secondary education (Gr. 12 / Std. 10), and only 2% of the population had some form of tertiary education. Figure 31 below provides a breakdown of the total level of education for the 2001 population figures.

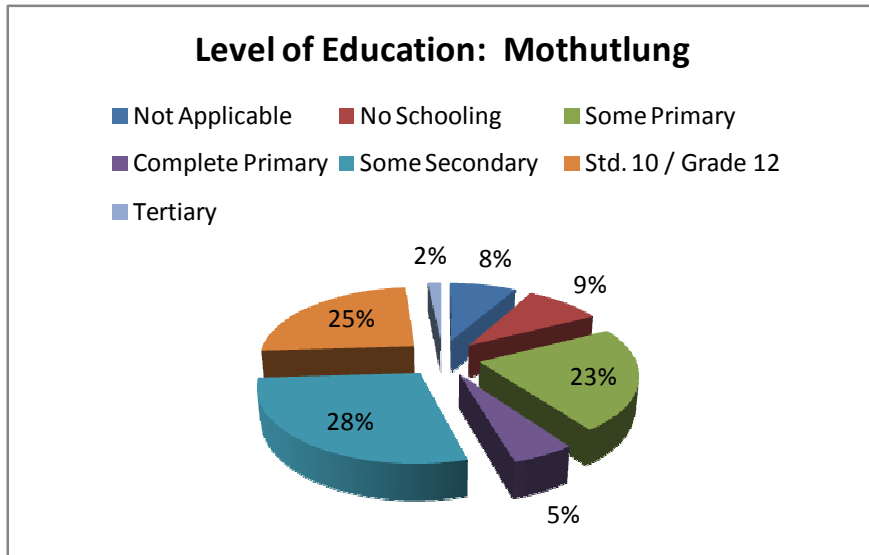


Figure 31: Level of Education – Mothutlung

Of the total population, 23% were employed during 2001, 24% were unemployed, and 46% were not “Economically Active”. Figure 32 below provides a breakdown of the employment status of the total population during 2001.

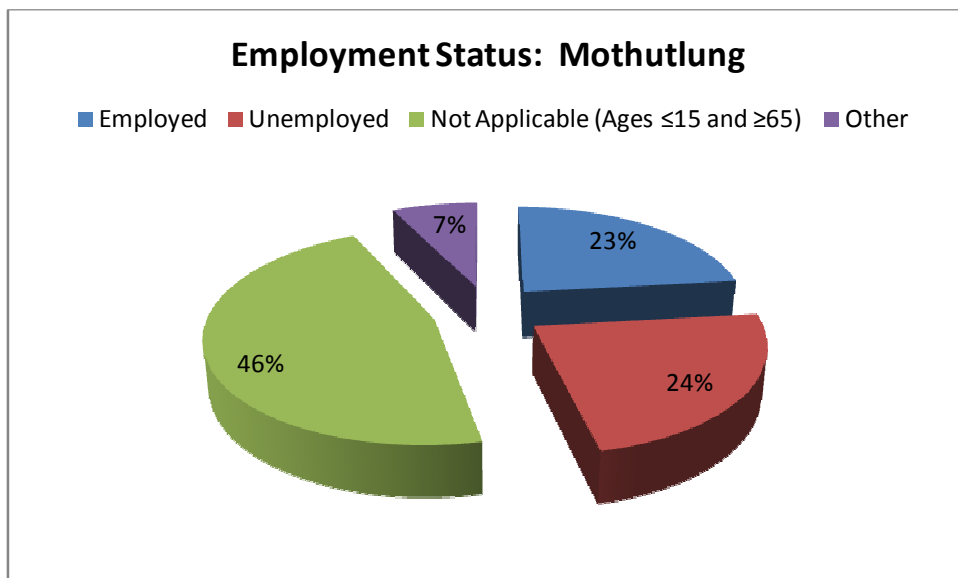
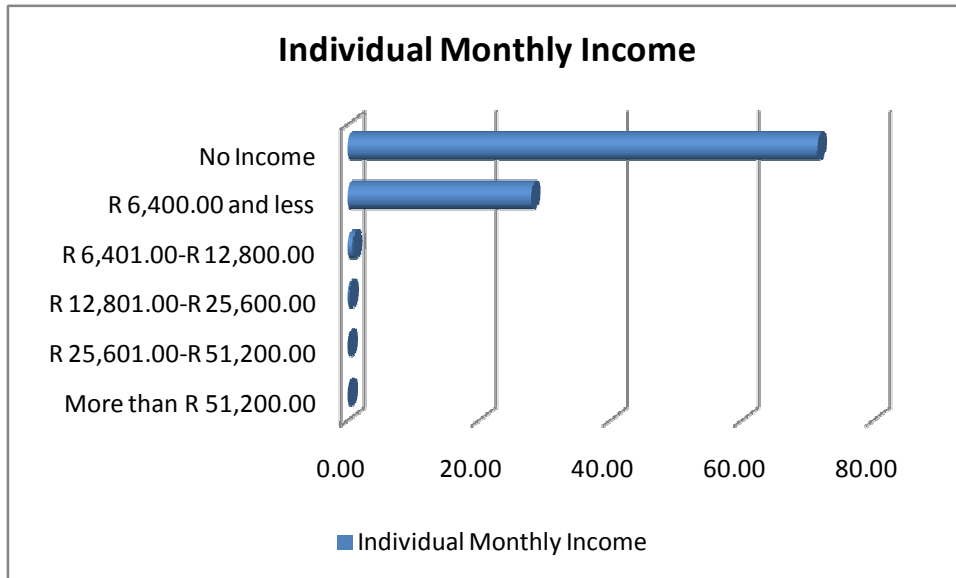


Figure 32: Employment Status – Mothutlung

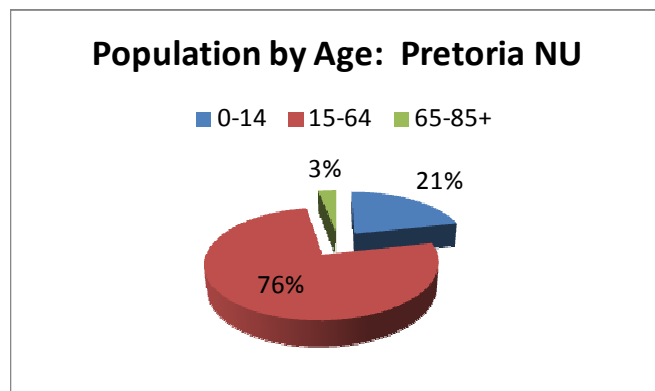
The graph below (Figure 33) provides a breakdown of the average monthly income per individual during 2001. A total of 71.3% of the total population did not receive any form of income, and 27.77% earned R 6,400.00 or less.



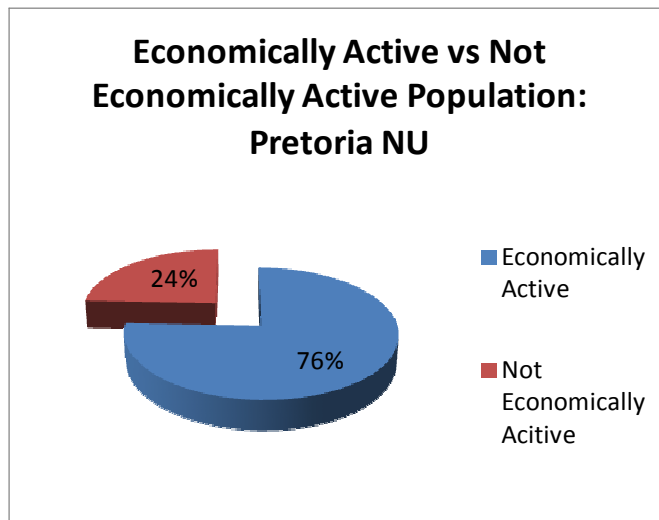
**Figure 33: Average Monthly Income – Mothutlung**

5.14.2.5 Pretoria NU

In 2001, according to the Census 2001 data, Pretoria NU had a total population of 16,060. Of this total population 76% were between the ages of 15-65 years, which is the age group classified by STATS SA as being “Economically Active”, and the remaining 24% of the population fell within the age group that is classified as “Not Economically Active”. Refer to Figure 34 below for a breakdown of the population by age, and to Figure 35 for an illustration of the “Economically Active” vs the “Not Economically Active” groups.

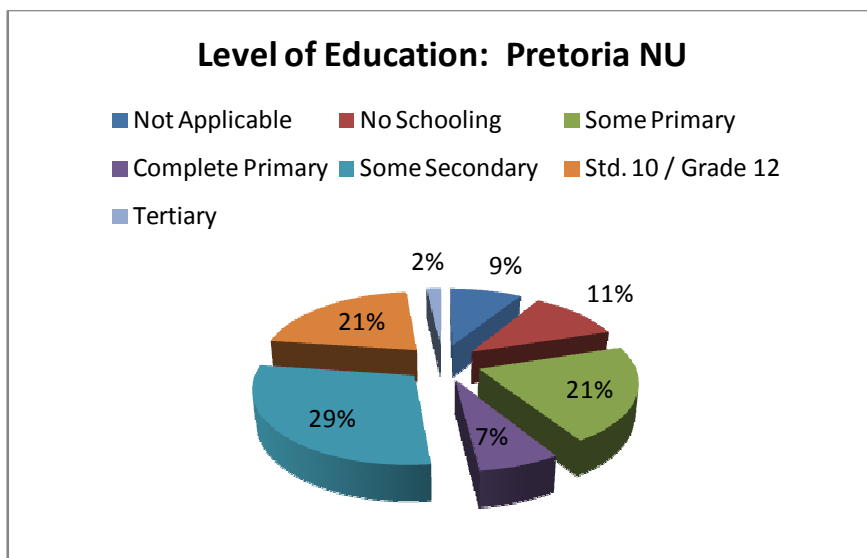


**Figure 34: Total Population by Age – Pretoria NU**



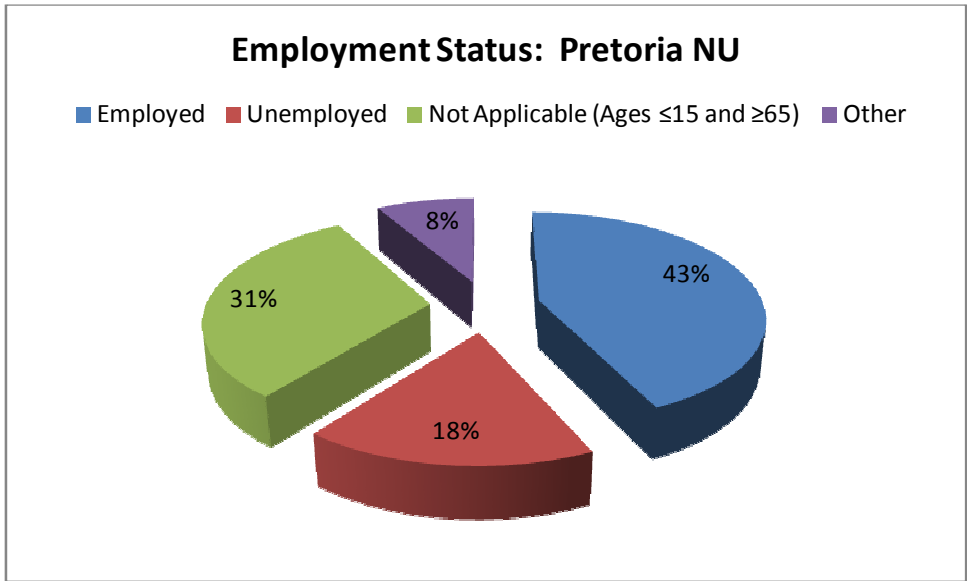
**Figure 35: Economically Active vs Not Economically Active – Pretoria NU**

During 2001, only 21% of the total population had a complete secondary education (Gr. 12 / Std. 10), and only 2% of the population had a tertiary education. Figure 36 below provides a breakdown of the total level of education for the 2001 population figures.



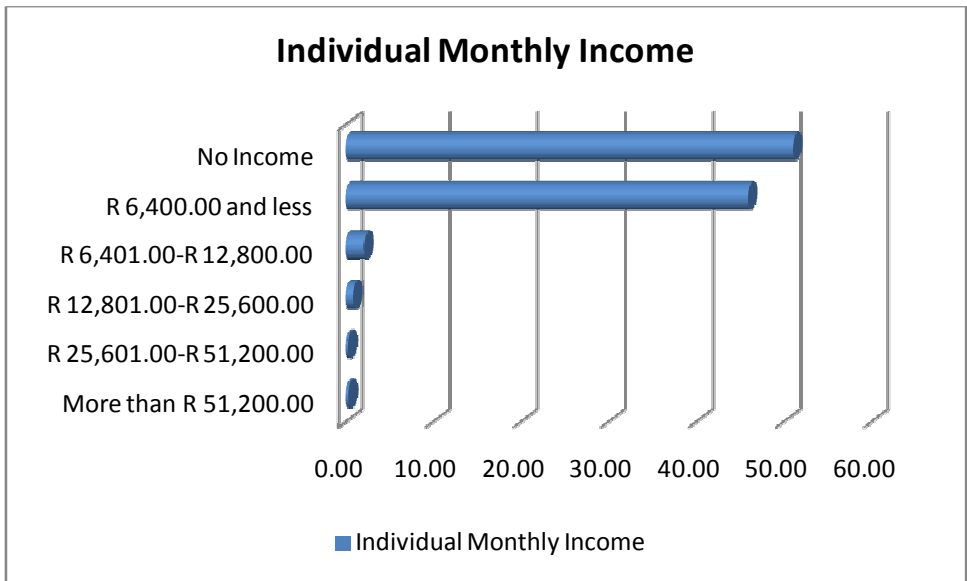
**Figure 36: Level of Education – Pretoria NU**

Of the total population, 43% were employed during 2001, 18% were unemployed, and 31% were not “Economically Active”. Figure 37 below provides a breakdown of the employment status of the total population during 2001.



**Figure 37: Employment Status – Pretoria NU**

The graph below (Figure 38) provides a breakdown of the average monthly income per individual during 2001. A total of 50.93% of the total population did not receive any form of income, and 45.8% earned R 6,400.00 or less.



**Figure 38: Average Monthly Income – Pretoria NU**

5.14.2.6 Magalies Nature Reserve SP

In 2001, according to the Census 2001 data, Magalies Nature Reserve SP had a total population of 337. Of this total population 78% were between the ages of 15-65 years, which is the age group classified by STATS SA as being “Economically Active”, and the remaining 22% of the population fell within the age group that is classified as “Not Economically Active”. Refer to Figure 39 below for a breakdown of the population by age, and to Figure 40 for an illustration of the “Economically Active” vs the “Not Economically Active” groups.

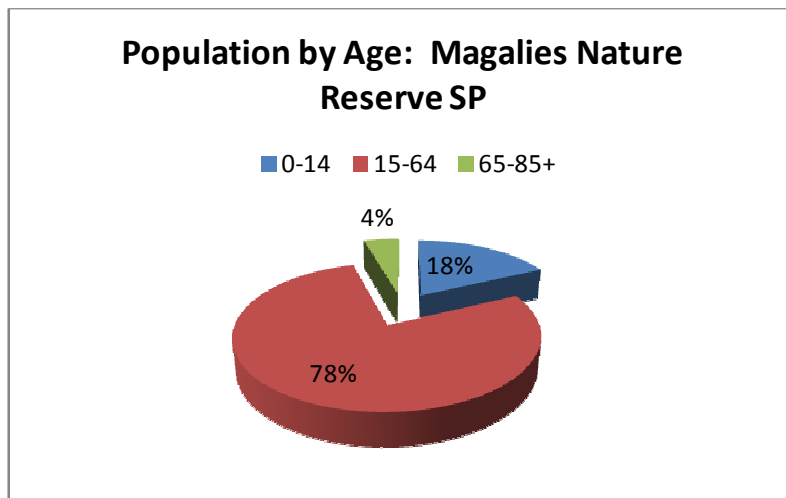


Figure 39: Total Population by Age – Magalies Nature Reserve SP

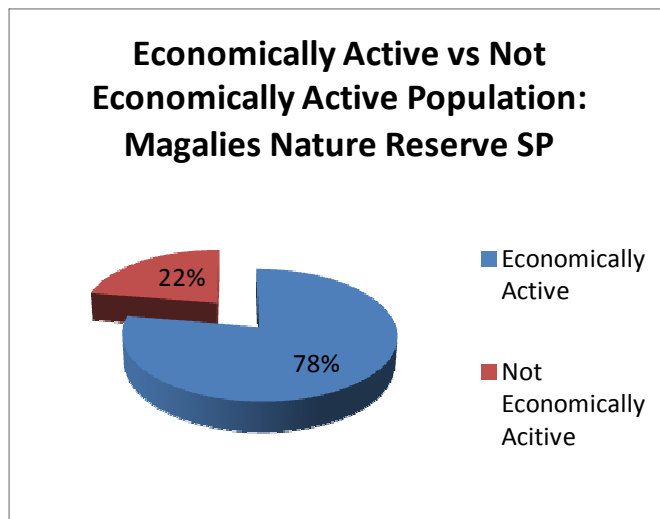
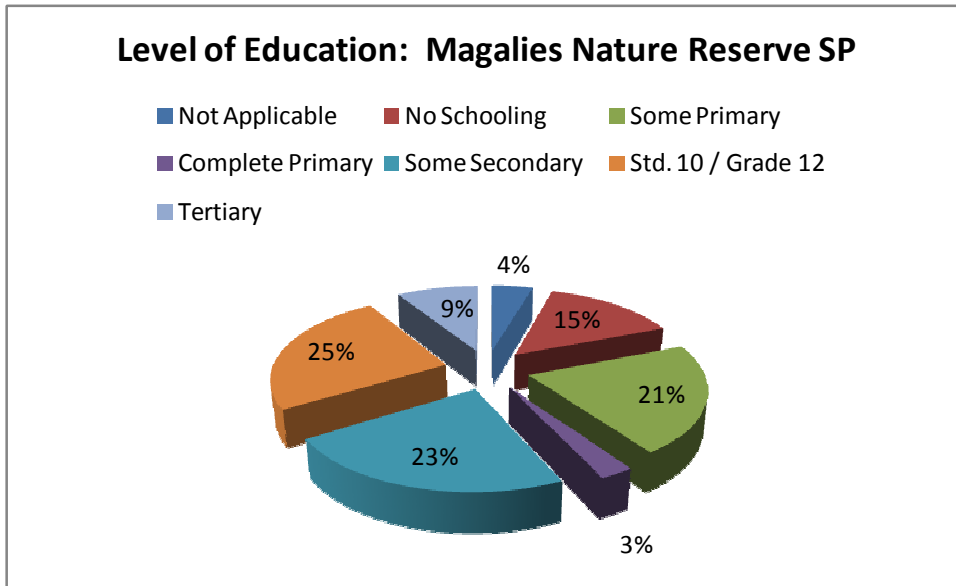


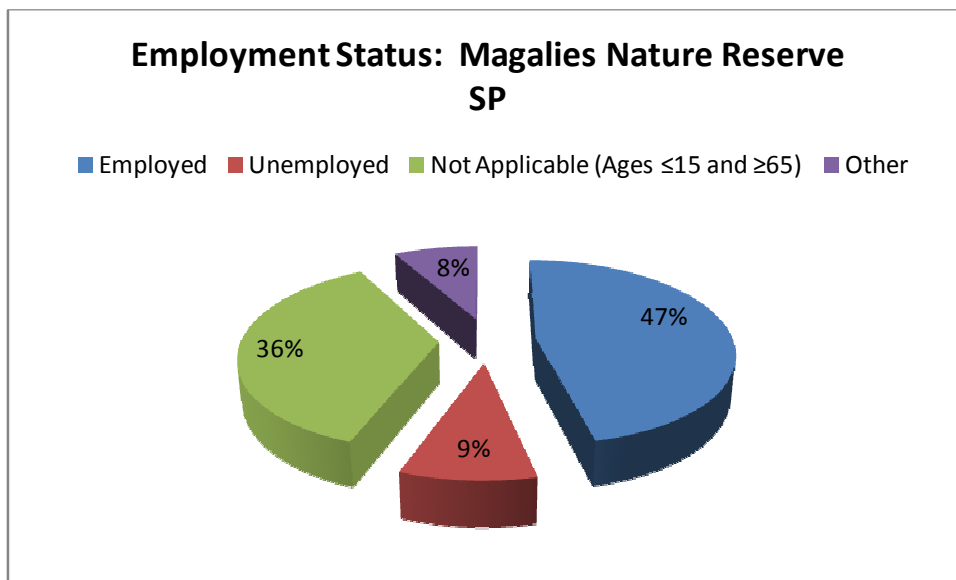
Figure 40: Economically Active vs Not Economically Active – Brits NU

During 2001, only 25% of the total population had a complete secondary education (Gr. 12 / Std. 10), and only 9% of the population had a tertiary education. Figure 41 below provides a breakdown of the total level of education for the 2001 population figures.



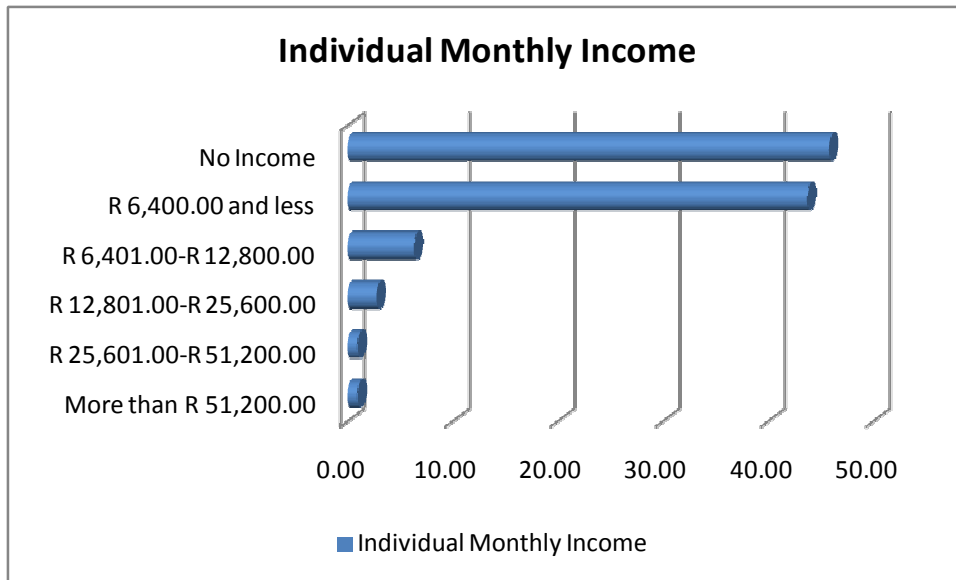
**Figure 41: Level of Education – Magalies Nature Reserve SP**

Of the total population, 47% were employed during 2001, 9% were unemployed, and 36% were not “Economically Active”. Figure 42 below provides a breakdown of the employment status of the total population during 2001.



**Figure 42: Employment Status – Magalies Nature Reserve SP**

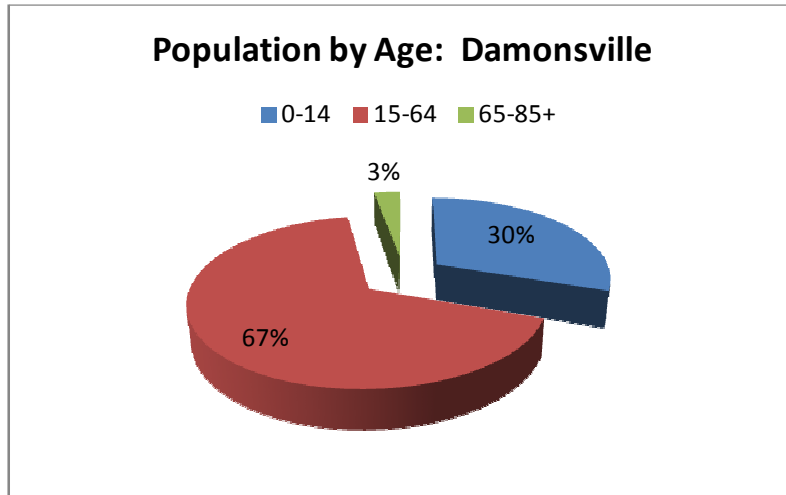
The graph below (Figure 43) provides a breakdown of the average monthly income per individual during 2001. A total of 45.7% of the total population did not receive any form of income, and 43.62% earned R 6,400.00 or less.



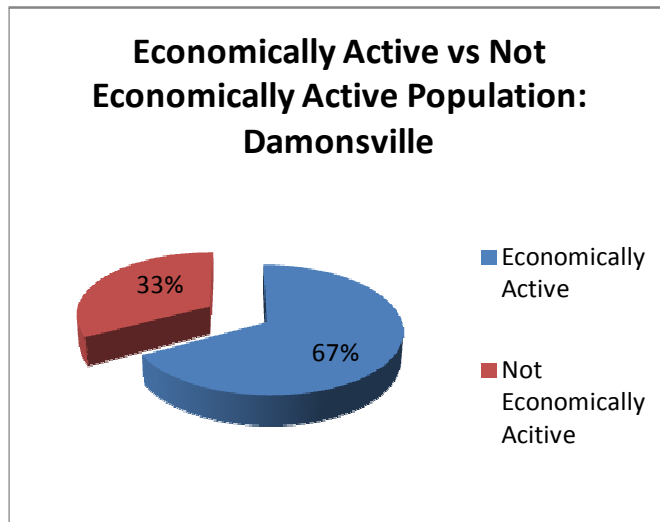
**Figure 43: Average Monthly Income – Magalies Nature Reserve SP**

5.14.2.7 *Damonsville*

In 2001, according to the Census 2001 data, Damonsville had a total population of 1,684. Of this total population 67% were between the ages of 15-65 years, which is the age group classified by STATS SA as being “Economically Active”, and the remaining 33% of the population fell within the age group that is classified as “Not Economically Active”. Refer to Figure 44 below for a breakdown of the population by age, and to Figure 45 for an illustration of the “Economically Active” vs the “Not Economically Active” groups.



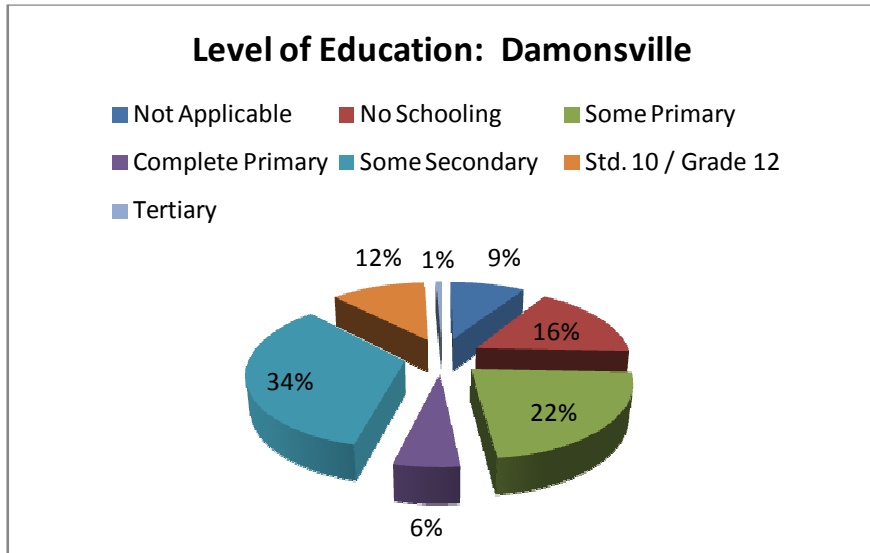
**Figure 44: Total Population by Age – Damonsville**



**Figure 45: Economically Active vs Not Economically Active – Damonsville**

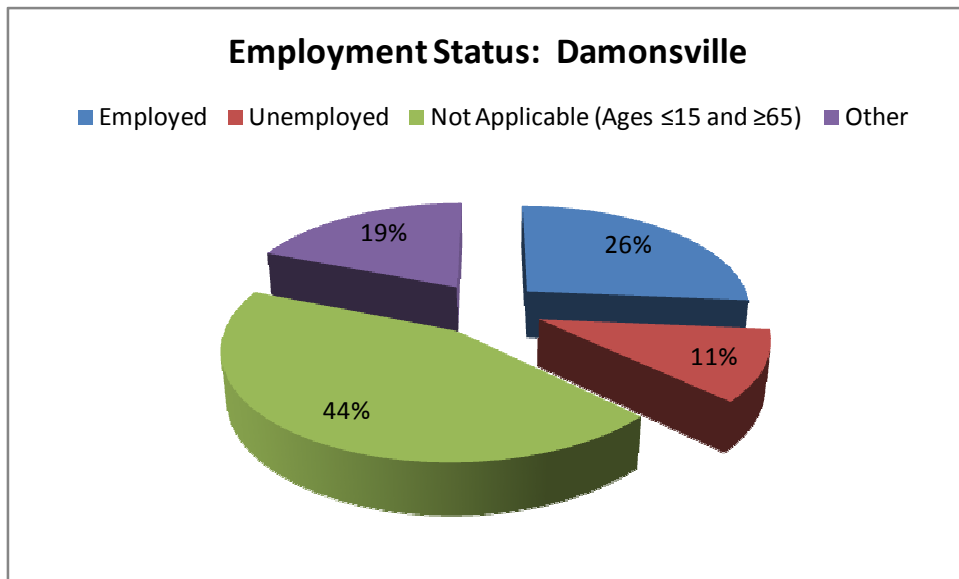
During 2001, only 12% of the total population had a complete secondary education (Gr. 12 / Std. 10), and only 1 % of the population had a tertiary education. Figure 46 below provides a breakdown of the total level of education for the 2001 population figures.





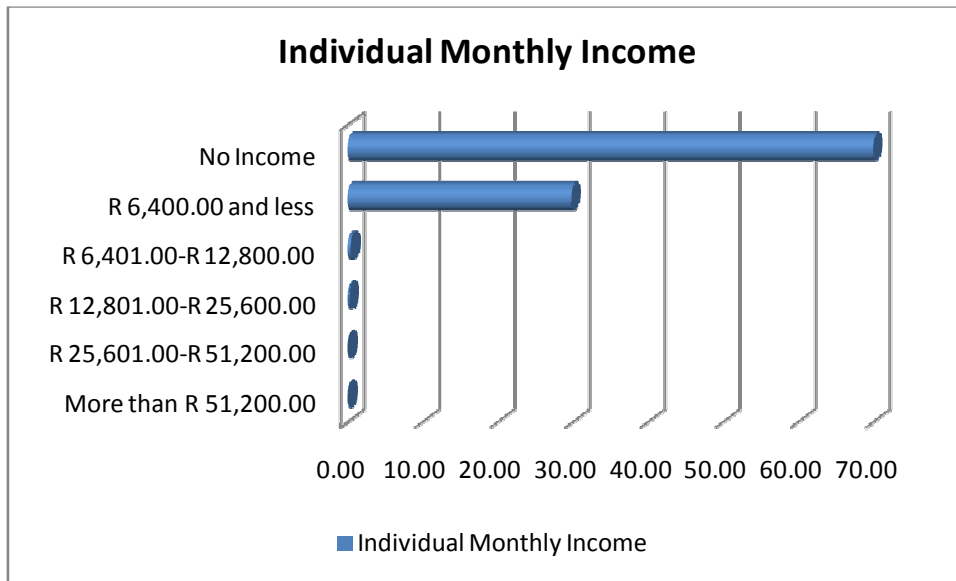
**Figure 46: Level of Education – Damonsville**

Of the total population, 26% were employed during 2001, 11% were unemployed, and 44% were not “Economically Active”. Figure 47 below provides a breakdown of the employment status of the total population during 2001.



**Figure 47: Employment Status – Damonsville**

The graph below (Figure 48) provides a breakdown of the average monthly income per individual during 2001. A total of 69.82% of the total population did not receive any form of income, and 29.65% earned R 6,400.00 or less.



**Figure 48: Average Monthly Income – Damonsville**

5.14.3 Social Issues

Unemployment rates in some of the sub-places are quite high and influx of job seekers and workers could create a negative attitude under the unemployed community.

5.14.4 Potential Impacts

Potential job opportunities could be created during the construction phases of the proposed powerline, therefore there would be an influx of job seekers and workers to the area. Job creation is viewed as a positive impact, however, only temporary jobs will be created, as no jobs will be created during the operational phase. Construction camps and construction activities could result in a negative visual impact for adjacent land uses. Furthermore unauthorised movement on private properties can occur during the construction phase. During the construction phase construction activities could have an impact on income generated by the various land uses, such as tourism facilities, agriculture and livestock or game farming. Noise impact created as a result of construction activities could negatively impact on adjacent land uses.

#### 5.14.5 Cumulative Impacts

Influx of job seekers and workers to the area could lead to higher unemployment rates and housing issues as workers and job seekers could relocate to the area in search of a job opportunities. The visual impact caused by construction activities will be a short term impact as it will only last throughout the construction phase. The permanent impact created by the powerline could be an additional visual impact to the area.

#### 5.14.6 Specialist Studies Required

A Social Impact Assessment, and an Economic Assessment will be undertaken during the EIA Phase.

### 5.15 Infrastructure and Services

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#### 5.15.1 Data Collection

- Walmsley, D., and Walmzley, J (Mzuri Consultants, Pretoria) & Mangold, S., and Kalule-Sabiti, M.(Directorate Environment & Conservation North West Department of Agriculture, Conservation and Environment) (2002). *North West Province State of the Environment Report*. Available from: <http://www.environment.gov.za/soer/reports/northwest>

#### 5.15.2 Regional Description

In terms of the North West State of the Environment Report, infrastructure in the Province is described as being relatively good. Infrastructure in the Province includes a road and rail network, air transport, post and telecommunication, electricity and bulk water supply. Major infrastructure issues in the province include development and delivery of infrastructure services to areas that did not have such infrastructure in the past. The Province has inherited a considerable amount of backlogs in meeting basic infrastructure delivery standards.

### 5.15.3 Site Description

Existing roads, railway lines, telecommunication infrastructure and a few centre pivots occur within the study area which the proposed powerline will traverse.

### 5.15.4 Potential Issues

Construction and operational activities could cause disruptions or damage to existing infrastructure and services.

### 5.15.5 Potential Impacts

The influx of job seekers and workers to the area during the construction phase could result in an increased demand for provision of water and sanitation services. Traffic on the roads will increase during the construction phase as construction vehicles will be travelling to and from the construction site (servitude area) for transportation and delivery of materials. Heavy vehicles could cause damage to existing road surfaces. Possible disruptions to railway traffic could occur during the construction phase. Construction activities could result in possible damage to railway Overhead Transmission Equipment as well as Telkom lines and posts during the construction phase. No impacts to infrastructure are expected during the operation phase.

### 5.15.6 Cumulative Impacts

Impact to infrastructure and services are only expected during the construction phase of the proposed powerline, and impact will therefore be temporary. No additional impact to infrastructure and services are expected during the operational phase of the proposed powerline.

### 5.15.7 Specialist Studies Required

None recommended.

## 5.16 Archaeology and Cultural Historical

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### 5.16.1 Data Collection

- Walmsley, D., and Walmsley, J (Mzuri Consultants, Pretoria) & Mangold, S., and Kalule-Sabiti, M.(Directorate Environment & Conservation North West Department of Agriculture, Conservation and Environment) (2002). *North West Province State of the Environment Report*. Available from: <http://www.environment.gov.za/soer/reports/northwest>
- Greater Pretoria Metropolitan Council. (2001). *Pretoria State of the Environment Report*. Available from: <http://www.ceroi.net/reports/pretoria/issues.htm>

### 5.16.2 Regional Description

Many important cultural heritage sites occurs within the North West Province. These sites includes well represented Stone Age and Iron Age sites, including the Kruger Cave; the Bosworth Rock Engraving site, Thaba Sione near Mafikeng and the stone-walled settlement of Kaditshwene in the Madikwe area. Furthermore, battlefields from the South African War occur in this province such as the Battle of Silikaatsnek (1900), and a number of forts, graves and blockhouses from this period also occurs within the province. A small portion of the Cradle of Humankind World Heritage Site (COHWHS) is located within the province. The condition of the known cultural heritage resources found within North West Province is considered to be relatively good.

Various important cultural assets are found within the City of Tshwane area, and some of these places are of high archaeological value. The Schurveberg area in the Centurion area has many valuable cultural and historical assets, which could be restored and conserved. Another important cultural asset in the study area includes the Tswaing Crater. Furthermore the section of the Magaliesberg in the Crocodile River area has a rich settlement history from the time of Mzilikasi, and British stone blockhouses occur within this area which dates back from the Boer war.

### 5.16.3 Site Description

Based on the regional/provincial description it is clear that many areas of cultural and historical value occurs in the province, Although the proposed alternative powerline routes and associated 1km study areas traverse the Zilkaatsnek and Schurveberg areas, it is not yet known whether any sites or artefacts of cultural of historical value occurs within the 1km study areas. A Heritage Impact Assessment is required during the EIA Phase to confirm whether any of these sites of cultural or historical importance will be impacted upon.

### 5.16.4 Environmental Issues

A Heritage Impact Assessment will be undertaken during the EIA Phase to determine whether any features or artefacts of historical or cultural importance occur within the study area. Impacts will be determined based on the outcome of the findings of the Heritage Impact Assessment Report and will be addressed in the EIA Report.

### 5.16.5 Potential Impacts

A Heritage Impact Assessment will be undertaken during the EIA Phase to determine whether any features or artefacts of historical or cultural importance occur within the study area. Impact will be determined based on the outcome of the findings of the Heritage Impact Assessment Report and will be addressed in the EIA Report.

### 5.16.6 Cumulative Impacts

A Heritage Impact Assessment will be undertaken during the EIA Phase to determine whether any features or artefacts of historical or cultural importance occur on site. Impact will be determined based on the outcome of the findings of the Heritage Impact Assessment Report and will be addressed in the EIA Report.

### 5.16.7 Specialist Studies Required

In terms of Section 38 of the National Heritage Resources Act (Act 25 of 1999), a Heritage Impact Assessment should be undertaken for the proposed project to determine whether any artefacts of cultural or historical importance occur on site.

## 6 PUBLIC PARTICIPATION PROCESS

A Public Participation Process was conducted as described in Regulation 58 of the EIA Regulations, 2006. The Public Participation Process included the following:

- Consultation and involvement of relevant Authorities at various levels;
- Consultation and involvement of the owners and occupiers of land adjacent to the properties earmarked for development, and within a 100m radius of the boundary of the site where the activity is to be undertaken, by hand delivering Background Information Documents (BID's) to all owners and occupiers within a 100m radius of the properties earmarked for development;
- Consultation and involvement of the municipal ward councillors of the wards in which the properties earmarked for development are located;
- Consultation and involvement of the municipality which has jurisdiction in the area;
- Consultation and involvement of any organ of state having jurisdiction in respect of any aspect of the activity;
- Compilation and placing of advertisements in local and regional newspapers;
- Compilation and placing of site notices on the properties earmarked for development;
- Compilation and distribution of Background Information Documents (BID's) to all relevant Stakeholders within a 100m radius; and
- Hosting of a Public Meeting.

### 6.1 Notification of Stakeholders

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Stakeholders were notified of the proposed development by means of the following:

#### 6.1.1 Advertising

Legal notices providing background to the proposed project was placed in The Star, The Beeld and The Kormorant. The notices appeared in these newspapers on the following dates:

- **The Star:** 06 October 2010;

- **The Beeld:** 07 October 2010; and
- **The Kormorant:** 07 October 2010

The initial Stakeholders comment period will end on the 17<sup>th</sup> of November 2010 and Stakeholder can therefore provide initial comment on project or register as Interested and Affected Parties (I&AP's) until this date. Copies of the Legal Notices and proof of placement in the above mentioned newspapers are attached in Appendix D.

### 6.1.2 Site Notices

A total of 5 Site notices were placed at various locations along the alternative powerline routes between the 5<sup>th</sup> and the 12<sup>th</sup> of October 2010. A copy of the site notice placed is attached to Appendix D. Table 18 below provides proof of the placement of the site notices, including a description of where the notices were placed. Site notices were only placed at Public places such as shopping centres, filling stations and Post Offices where it would attract the attention of the local residents. Previous experience have shown that placing of notices at road intersections and on fences along the route does not attract the necessary attention

**Table 18: Proof of Placement of Site Notices**





Proof of Site Notices Placed



Figure 2: Site Notice Placed at Mothutlung Post Office



Figure 3: Site Notice Placed at Supermarket in Broederstroom



Figure 4: Site Notice Placed at Sasol Garage on the R511

Figure 5: Site Notice Placed at Pick and Pay at the Xanadu Shopping Centre along the R511

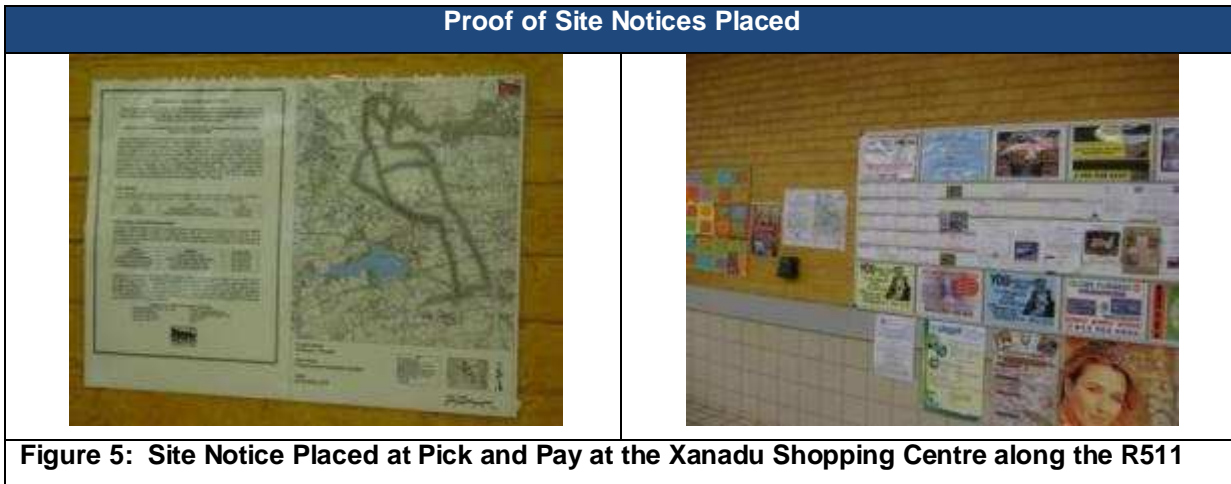


Figure 5: Site Notice Placed at Pick and Pay at the Xanadu Shopping Centre along the R511

6.1.3 Distribution of Background Information Documents

A Background Information Document (BID) was compiled and copies of this BID were distributed to all landowners, tenants, and business owners currently affected by the proposed centre line. The BID's were distributed between the 5<sup>th</sup> and the 12<sup>th</sup> of October 2010. A total of 500 BID's were hand delivered to the aforementioned parties. A distribution register was compiled which had to be signed by every person receiving a copy of the BID. Where a landowner, tenant or business owner was not available on the day of distribution, a copy of the BID was left in the mail box, or attached to the access gate of the property, and was noted on the distribution register. A copy of the BID and distribution register is attached as Appendix D.

A reply form was attached to the BID, which Stakeholders could complete to raise their issues and concerns and to register as an Interested and Affected Party (I&AP). Details of registered I&AP's were added to the Stakeholder Database, and issues and concerns raised were captured and addressed in the Issues and Response Register which are tabled below in Table 20.

In an attempt to notify all affected landowners, tenants and business owners within the study area, a flyer was compiled to notify the community of the project. Copies of the flyers were provided to three Post Offices located within the study area for distribution to all post boxes. The details of the post offices and the amount of flyers placed in the relevant post boxes are provided in the table below. A copy of the flyer and proof of delivery to the various Post Offices is provided in Appendix D.

Post Office	No of Flyers Placed in Post Boxes
Hartbeespoort Post Office	1005 post boxes

Post Office	No of Flyers Placed in Post Boxes
Brits Post Office	3000 post boxes
Broederstroom Post Office	920 post boxes

6.1.4 Consultation and Involvement of Municipal Ward Councillors

Background Information Documents were forwarded to the City of Tshwane Local Municipalities Ward Councillors office as well as to the Madibeng Local Municipalities Ward Councillors office. No response has been obtained to date from any of these offices. Several attempts were made to contact the Ward Councillor's, however, no contact person or contact details could be established to date.

6.1.5 Public Meeting

Public meetings were held on Monday the 18<sup>th</sup> of October 2010, and on Tuesday the 19<sup>th</sup> of October 2010. The details of the meetings are tabled below.

**Table 19: Public Meeting Details**

Date	Venue	Time
18/10/2010	Hoërskool Brits 1 Johan Street Brits	17:30-19:30
19/10/2010	Laerskool Broederstroom Plot 33, Primula Street, Flora Park	17:30-19:30

The details of the public meeting appeared in the legal notice (detailed above in Section 6.1.5), and in the BID (detailed above in Section 6.1.4). Minutes of these public meetings, as well as the attendance registers are attached to Appendix D.

6.1.6 Consultation and Involvement of the Local Municipality

Background Information Documents were distributed within the City of Tshwane Local Municipality and the Madibeng Local Municipality as follows:

Name	Department	E-mail Address	Contact No
Portia Ravele	Madibeng Local Municipality –	portiaravele@madibeng.gov.za	012 318 9453

Name	Department	E-mail Address	Contact No
	Town Planning Department		
Reuben Moatshe	Madibeng Local Municipality – Environmental Department	reubenmoatshe@madibeng.gov.za	012 318 9518
Lodi Olivier	City of Tshwane Local Municipality – Town Planning Department	lodio@tshwane.gov.za	012 358 3880
Ruzani Mukheli	City of Tshwane Local Municipality – Environmental Department	ridzanim@tshwane .gov.za	012 358 8672

Proof of consultation with these Departments is attached as Appendix C. No response has been received from this Department to date.

A copy of this Draft Scoping Report will be submitted to the various Departments mentioned above for review and comment during the same time as this Report is made available for Public Review.

#### 6.1.7 Consultation and Involvement of Commentary Authorities and Parastatals

Copies of the BID were forwarded to the following parastatals to notify them of the proposed project:

Name	Department	E-mail Address	Contact No
Phillip de Klerk	Transnet	Phillip.deklerk@transnet.net	
Mr Ntemane	North West Province Roads Department	antemane@nwpg.gov.za	
Mashudu Maduka	Department of Mineral Resources	Mashudu.maduka@dmr.gov.za	
Mr K Schmid	National Roads Agency	schmidk@nra.co.za	
Mr Monama	North West Department of Housing	cmonama@nwpg.gov.za	

Proof of notification to these parastatals is attached to Appendix C. No comment has been obtained from any of these parties to date.

Copies of the Draft Scoping Report will be submitted to the following Authorities for review and comment:

- Gauteng Department of Agriculture and Rural Development;
- North West Department of Agriculture, Conservation and Environment;
- Department of Water Affairs (DWA);

- National Department of Agriculture (NDA);
- Provincial Heritage Resources Authority, Gauteng; and
- North West Provincial Heritage Resources Authority.

**6.1.8 Consultation with Key Stakeholders**

The table below provided the details of the key stakeholders that was identified and consulted with during July to September 2009 based on the initial proposed route alignment and initial proposed substation site location. Meetings were held with several of the mines as well as with the Magaliesberg Protection Association (MPA) during this period. The minutes of these meetings have not been included in this Report as the meetings were based on the initial proposed route alignment and substation site location. These key stakeholders were notified of the new proposed route alignment and substation location during the initial Public Participation Phase which commenced on the 5<sup>th</sup> of October 2010. Proof of communication with these parties is attached to Appendix D.

<b>Name / Company</b>	<b>Contact Person</b>	<b>Contact No</b>	<b>E-Mail Address</b>
Eland Platinum Mine (Xstrata Alloys)	General Works Manager: Rodney O'Riley	012 381 4002	
	Rodney's Secretary: Renate Robertse	012 381 4100	
	Johan Kleinhans	012 381 4100	
	Zola Phambukha	082 756 6645	zpambuka@xstrata.co.za
	Barend van der Walt	082 809 7166	
Easplats: Crocodile River Mine	Dawie Barnard	012 381 1800	dbarnard@eastplats.co.za
Vametco Minerals (Previously UCAR Vanadium Mine)	Frikkie Kent	012 318 3318	Frikkie.kent@vam.stratcor.com
Marlin Group (Finstone SA)	Judy	011 755 5000	jks@finstone.net
Nuclear Energy Corporation South Africa (NECSA)	Switchboard	012 305 4911	
	Environmental Monitoring	012 305 3377	
	Isabel Steyn	012 305 3343	
Prof Gerhard Verdoorn	Bird Life Africa & Griffon Poison Information Centre	082 446 8946	nesher@tiscali.co.za
Albrecht Holm	Hartbeespoort Environment	082 494 7568	hoev.heha@worldonline.co.za
Dr Richard Patton	Magaliesberg Protection Association	082 775 6697	rpatton@mweb.co.za
Vincent Carruthers	VC Management Services CC	082 411-8033	vcms@mweb.co.za
Barbara Reid	Magaliesberg Protection Association	083 702 0530	sleighb@iafrica.com

6.1.9 Stakeholder Database

A Stakeholder Database was compiled which includes the names and contact details of the Authorities, and Municipal Departments, as well as details of all the Stakeholders who registered as I&AP's during the Public Participation Period, and whom provided comment, or raised issues and concerns regarding the proposed development. The Stakeholder Database is attached to Appendix D.

6.1.10 Issues and Concerns Raised

The issues and concerns raised during the Stakeholder engagement process were captured in an Issues and Response Register which is tabled below in Table 8. Reference numbers were allocated to each individual that registered as an I&AP, and that has provided comment or raised issues and concerns during the initial Public Participation Period. Stakeholder details were captured in the database under these assigned reference numbers. Comments were captured in the Issues and Response Register using the reference numbers instead of the individual names.

The Stakeholder Database and allocated reference numbers are attached to Appendix D. Please refer to Appendix D for the names and contact details of the individuals that raised the comments.

**Table 20: Issues and Response Register**

Ref No:	Date Comment Received	Comment Raised	Response Given
SP-IPP-AJ	3/11/2010	Mr A J Jansesn requested to be registered as an Interested and Affected Party (I&AP), and indicated that the following property owners should be notified of the proposed project: <ul style="list-style-type: none"> <li>Flora Park Portions 6, 9, 12, 13, 47, 48, 90 and 91.</li> </ul>	Mr Jansen was registered as an I&AP. Mr Jansen's comment was noted. The owners of the properties mentioned by Mr Jansen will be notified of the projects.
SP-IPP-ZP	05/10/2010	Mr Phambuka requested an electronic copy of a detailed map in order to establish how the Farm Elandsfontein 440 JQ will be affected by the proposed projects.	A detailed locality map showing all the alternative powerline routes as well as the associated 1km study area and location of the two alternative substation sites was forwarded to Mr Phambuka via Send2Delviver on the 11 <sup>th</sup> of October 2010.
SP-IPP-PDH	07/10/2010	Mr de Haas mentioned that he stays and works in the area and requested a detailed copy of a locality map.	A detailed locality map showing all the alternative powerline routes as well as the associated 1km study area and location of the two alternative substation sites was forwarded to Mr de Haas via Send2Delviver on the 11 <sup>th</sup> of October 2010.
SP-IPP-RO	11/10/2010	Ms R Oelofse requested to be registered as an Interested and Affected Party (I&AP). Mentioned that she owns a property directly to the east of the proposed route which traverses Kameeldrift West. Indicated that she would like to comment on the project and enquired on how the comments should be made.	Ms Oelofse was registered as an I&AP, and it was indicated to Ms Oelofse that all comments regarding the project should be submitted to the relevant EAP from Nema Consulting.
SP-IPP-CM	13/10/2010	Mr Malan requested to be requested to be registered as an Interested and Affected Party (I&AP). Mr Malan indicated that he is the owner of Portion 191 of the Farm 485 JQ. Requested to obtain a copy of the BID.	Mr Malan was registered as an I&AP. A copy of the BID was e-mailed to Mr Malan on the 13 <sup>th</sup> of October 2010, furthermore a detailed locality map showing all the alternative powerline routes as well as the associated 1km study area and location of the two alternative substation sites was forwarded to Mr Malan via Send2Delviver on the 13 <sup>th</sup> of October 2010.
SP-IPP-MM	13/10/2010	Mr Matthias Malan was copied on the e-mail which was sent to Mr Chris Malan (above). Mr Malan was out of the office and an out of office reply was received.	Mr Malan was registered as an I&AP

Ref No:	Date Comment Received	Comment Raised	Response Given
SP-IPP-WL	13/10/2010	Mr Lord requested to be registered as an I&AP. Mr Lord submitted a completed Reply Form, and indicated on this form that his property is directly affected by the proposed substation alternatives and request to be kept informed of the project	Mr Lord was registered as an I&AP. Mr Lord will be kept informed of the proposed project throughout the Scoping and EIA Phases.
SP-IPP-KW	14/10/2010	Mr Young requested to be registered as an I&AP and requested KML or KMZ files of the proposed route or a detailed locality map.	Mr Young was registered as an I&AP. A detailed copy of the map will be forwarded to Mr Young as requested.
SP-IPP-JS	14/10/2010	Ms Strachan enquired details on which of Finstone's properties will be affected.	A copy of the BID and list of all affected properties located within the study area was sent to Ms Strachan on the 13 <sup>th</sup> of October 2010..
SP-IPP-TH	15/10/2010	Mr Hanekom requested to obtain a copy of the BID.	A copy of the BID and locality map was sent to Mr Hanekom on the 1 <sup>st</sup> of November 2010.
SP-IPP-HE	18/10/2010	Ms Eloff requested a copy of the BID and enquired on whether their property will be affected by the proposed development.	Ms Eloff was registered as an I&AP. A copy of the BID was e-mailed to Mr Malan on the 19 <sup>th</sup> of October 2010, furthermore a detailed locality map showing all the alternative powerline routes as well as the associated 1km study area and location of the two alternative substation sites was forwarded to Mr Malan via Send2Delviver on the 19 <sup>th</sup> of October 2010. A map was also compiled showing the location of Portion 157 and where this portion is located in relation to the project.
SP-IPP-MW	13/10/2010	Mr Wright contacted Nemaï on the 19 <sup>th</sup> of October 2010 and requested a copy of the BID and locality map to determine whether his property will be affected by the proposed project.	A copy of the BID was e-mailed to Mr Wright on the 13 <sup>th</sup> of October 2010, furthermore a detailed locality map showing all the alternative powerline routes as well as the associated 1km study area and location of the two alternative substation sites was forwarded to Mr Wright via Send2Delviver on the 13 <sup>th</sup> of October 2010.
SP-IPP-MW	19/10/2010	Mr Wright thanked Nemaï for providing him with the requested information and indicated that his property is not located near the study area.	Noted.
SP-IPP-BL	24/10/2010	Mr Lotter thanked Nemaï for the presentation held at the Laerskool Broederstroom on the 19 <sup>th</sup> of October 2010. Mr Lotter wanted to ensure that his comments raised during the public meeting were captured and therefore submitted his comment made in writing. Mr Lotter made the following comments: <ul style="list-style-type: none"> <li>Enquired on the motivation for the proposed powerline and the</li> </ul>	All comments noted by Mr Lotter have been addressed in the Scoping Report. A copy of the map requested will be forwarded to Mr Lotter. Mr Lotter was registered as an I&AP.  A copy of the BID was e-mailed to Mr Lotter on the 18 <sup>th</sup> of October 2010, furthermore a detailed locality map showing all



Ref No:	Date Comment Received	Comment Raised	Response Given
		<p>necessity thereof;</p> <ul style="list-style-type: none"> <li>• Requests a formal opinion from the Madibeng Local Municipality regarding the proposed powerline;</li> <li>• Enquired on the consultation Nemaï and Eskom had with NECSA regarding the establishment of a substation on the NECSA property;</li> <li>• Enquired to obtain a map of the project zoomed into the area where the substation sites and Roos se Oord is located. Requested that property numbers be included on the map; and</li> <li>• Requested to be registered as an I&amp;AP.</li> </ul>	<p>the alternative powerline routes as well as the associated 1km study area and location of the two alternative substation sites was forwarded to Mr Lotter via Send2Delviver on the 18<sup>th</sup> of October 2010.</p>
SP-IPP-GN	25/10/2010	Mr Gert Nel enquired how Estate D' Afrique will be affected by the proposed project. Enquired obtain a copy of a detailed locality map.	A copy of the locality map will be forwarded to Mr Nel as requested.
SP-IPP-EvH	01/11/2010	Ms Eurika van Heerden requested to be registered as an I&AP.	Ms van Heerden was registered as an I&AP.
SP-IPP-BR	03/10/2010	Ms Barbara Reid requested that the Magaliesberg Protection Association (MPA) be registered as an I&AP.	The MPA was registered as an I&AP.
SP-IPP-JP	13/10/2010	Mr Joe Prinsloo requested to be registered as an I&AP and to obtain a copy of the BID and locality map.	Mr Prinsloo was registered as an I&AP. A copy of the BID was e-mailed to Mr Prinsloo on the 13 <sup>th</sup> of October 2010, furthermore a detailed locality map showing all the alternative powerline routes as well as the associated 1km study area and location of the two alternative substation sites was forwarded to Mr Prinsloo via Send2Delviver on the 13 <sup>th</sup> of October 2010.
SP-IPP-CK	15/10/2010	Mr Kroon requested to be registered as an I&AP and to obtain a copy of the BID and locality map.	Mr Kroon was registered as an I&AP. A copy of the BID was e-mailed to Mr Kroon on the 15 <sup>th</sup> of October 2010, furthermore a detailed locality map showing all the alternative powerline routes as well as the associated 1km study area and location of the two alternative substation sites was forwarded to Mr Kroon via Send2Delviver on the 15 <sup>th</sup> of October 2010.
SP-IPP-BE	19/10/2010	Ms Eman requested a copy of the BID and locality map. Ms Eman raised concern with regards electricity supply in he Lanseria area, and mentioned that lots of development is planned but that current electricity supply to the area will not sustain these developments.	A copy of the BID was e-mailed to Ms Eman on the 19 <sup>th</sup> of October 2010, furthermore a detailed locality map showing all the alternative powerline routes as well as the associated 1km study area and location of the two alternative substation sites was forwarded to Ms Eman via Send2Delviver on the 19 <sup>th</sup> of October 2010.

Ref No:	Date Comment Received	Comment Raised	Response Given
			<p>Ms Eman's property will not be affected by the proposed project as it is located approximately 8km south west of the proposed Anderson Substation.</p> <p>Ms Eman's comment was forwarded to Eskom.</p>
SP-IPP-WS	18/10/2010	Mr Wessel Steenkamp requested that a copy of the BID and detailed map be posted to him.	Copies of the documentation requested will be posted to Mr Steenkamp.
SP-IPP-JHJvR	20/10/2010	Mr J Janse van Rensburg requested to be registered as an I&AP.	Mr van Rensburg was registered as an I&AP.
SP-IPP-JvR	20/10/2010	Mr van Rensburg provided Nemaï with information on a proposed development (Swansvlei) earmarked for development on the Farm Rietfontein 485 JQ.	Comments noted.
SP-IPP-HvR	18/10/2010	Mr Hans van Rensburg requested to obtain a zoomed in map which shows the location Plot 28, 29, 30 and 33.	A map as requested will be forwarded to Mr van Rensburg.
SP-IPP-JP	19/10/2010	<p>Mr Prinsloo raised the following issues and concerns with regards to the proposed project:</p> <ul style="list-style-type: none"> <li>Expressed confusion with regards to the EIA process and Environmental Authorisation Process.</li> <li>Enquired on when landowner negotiations will be undertaken prior to or after EA. Is of the opinion that this must be done prior to EA in order to agree to compensation;</li> <li>Mentioned that there is already a powerline located in his property and this exiting associated servitude causes a lot of problems as it allows for easy access to his property. Mentioned that they have experienced many issues in the past due to vagrants trespassing onto his property, and indicated that he is very concerned about the construction of a proposed new powerline as issues experienced on the property will be increased;</li> <li>Mentioned existing servitude formed a thoroughfare on his property and enquired how Eskom is planning on dealing with this issue with the Anderson-Dinaledi Powerline;</li> <li>Enquired on Eskom's obligation to maintain gates and fences to prevent unlawful access to privately owned land;</li> </ul>	<p>Mr Prinsloo was registered as an Interested and Affected Party. Mr Prinsloo's comments have been noted. Details on some of the queries are already provided in the Scoping Report, however, some questions will only be addressed during the EIA Phase. The following response is provided:</p> <ul style="list-style-type: none"> <li>Landowner negotiations already commences during the EIA Phase, however, negotiations cannot be finalised prior to receiving Environmental Authorisation for an approved powerline corridor from DEA. As a corridor will be approved and not an exact centre line, the exact location of the proposed centre line will only become known after a corridor was approved, after landowner negotiations and after the walk down survey by specialists. This answer should also provide clarity to the confusion of the Scoping and EIA Process and Authorisation process;</li> <li>All security and access control issues as well as details on maintenance of powerlines and servitudes as well as damage to fences and access gates are dealt with in the Environmental Management Plan. Specific landowner</li> </ul>

Ref No:	Date Comment Received	Comment Raised	Response Given
		<ul style="list-style-type: none"> <li>Enquired whether new servitude area will be fenced off and if so, which measures will be implemented to maintain the fences. Enquired who the contact person is where complaints could be submitted to with regards to poor servitude maintenance and damage to fences and gates;</li> <li>A new powerline to the east of his property will mean that the property will be bordered by two high voltage lines. Enquired on human health impacts caused by powerlines;</li> <li>Powerline will impact on aesthetics of his property and will cause a decrease in property value. Mentioned that his property is located within a very scenic area. Enquired on compensation with regards to these impacts;</li> <li>Enquired who the owner of the Plot located the west of their property. Mentioned that this plot is vacant and that the powerline should be rather be constructed on this vacant property;</li> <li>Mentioned that locating the powerline on this vacant property will group the existing linear impact and this will be more acceptable to him;</li> <li>Requested that Ms Els, the owner of the vacant property to the west be contacted with regards to the project, and enquired whether Ms Els raised any concerns with regards to the proposed project;</li> <li>Current servitude on his property is located between tow exsiting roads, which make access to his property very easy. Again expressed concern with regards to the management the servitude for the Anderson-Dinaledi line as well as on the maintenance of access gates and fences.</li> </ul>	<p>requirements and conditions will based on the aforementioned will form part of the negotiation process and agreements between Eskom and the landowner should be signed to ensure that landowner concerns and management measures are adhered to. A Social Impact Study will be done during the EIA Phase and the findings of this study will be included in the EIA Report.</p> <ul style="list-style-type: none"> <li>Fencing of the servitude area will be addresses with each affected landowner during the negotiation process;</li> <li>The existing 88kV powerline which is located in the property of Mr Prinsloo will be decommissioned in future. Exact details of the decommissioning process will be incorporated into the EIA Report;</li> <li>Attempts have been made to consult with Ms Els. Details on consultation with Ms Els will be provided to Mr Prinsloo.</li> <li>Eskom acquires servitudes according to the Constitution and the Expropriation Act which states that actual financial loss must be paid, this value is determined by a registered independent land valuer and is a once off payment. The value takes all of the issues raised into consideration. Damage to crops is determined on actual damage during construction which is damage that must happen to create an area for a tower or for an access path for stringing conductors, and is paid at that time.</li> <li>Eskom's lines are designed to meet international EMF standards and will therefore not cause any harmful EMF's. A full Electromagnetic Report undertaken for previous studies will be incorporated into the EIA Report.</li> </ul>
SP-IPP-MO	July 2010	<p>Mr Oosthuizen contacted Nema Consulting in early July 2010 regarding the proposed projects. Mr Oosthuizen provided the following comments:</p> <ul style="list-style-type: none"> <li>Mr Oosthuizen owns a property in the study area. Mr Oosthuizen enquired on the status of the project and on the proposed route alignment. Mr Oosthuizen indicated that he is opposed to a 2km wide</li> </ul>	<ul style="list-style-type: none"> <li>A meeting was held with DEA on the 8th of July 2010 to discuss the comments raised by Mr Oosthuizen, and also to discuss Eskom's request to in future study 5km wide corridors without a centre line and a 2x2km study area for substation. During this meeting the Public Participation</li> </ul>

Ref No:	Date Comment Received	Comment Raised	Response Given
		<p>study area, but that a 1km study area would be suitable. Mr Oosthuizen also indicated that a fixed route alignment should be included within the 1km study corridor, as legislation only accommodates for directly affected people, and that directly affected landowners cannot be indentified within a 1km wide study area. Also mentioned that specialist studies could not be accurate when studying a full 1km study corridor, and therefore it is important to include a centre line.</p> <ul style="list-style-type: none"> <li>Mr Oosthuizen requested to review the Scoping Report, and also requested that a meeting with DEA be held to establish the allowable servitude width and that this meeting should be minuted. Requested that the minutes be included in the Scoping Report as proof that this meeting took place. Mr Oosthuizen indicated that he does not have internet access, and that he is unable to forward written comment to Nema.</li> </ul>	<p>process to be followed was also discussed with DEA. The outcome of the meeting are briefly summarised below:</p> <ul style="list-style-type: none"> <li>DEA will not allow a 5km wide study area, and a 2km wide study corridor will also not be allowed. A 1km study corridor would be suitable, and a preferred alignment must be included within the study corridor. DEA authorises a study corridor and the exact route are only determined after the project has been authorised.</li> <li>A 2x2km study area will not be allowed for the proposed substation. A substation is fixed, and therefore a fixed site should be investigated for the proposed substation. A 600x600m site will be acceptable.</li> <li>The Public Participation Process items discussed with DEA which was approved during the meeting are as follows:</li> <li>Only directly affected landowners on the route to be identified. All other I&amp;AP's within the 1km corridor to be indentified as potentially affected;</li> <li>Key stakeholders in the study area, such as mines, etc to be identified;</li> <li>Site notices to notify broader public of the project and on the public meetings to be placed along the route;</li> <li>No landowner consent forms will be required as this project is a linear project; and</li> <li>A landowner consent form will be required for the Substation site.</li> </ul>
SP-IPP-RO	04/11/2010	Ms R Oelofse requested to obtain a copy of the Public Meeting minutes.	A copy of the minutes will be forwarded to Ms Oelofse.
SP-IPP-HvR	04/11/2010	Mr Hans van Rensburg requested a detailed map showing how Plot 13 Schietfontein will be affected by the proposed powerline.	A detailed map showing the proposed powerline alternatives, associated 1km corridor and affected properties was e-mailed to Mr van Rensburg on the 4 <sup>th</sup> of November 2010.

Ref No:	Date Comment Received	Comment Raised	Response Given
SP-IPP-AJ	03/11/2010	Mr Jansen requested to obtain a copy of the Public Meeting minutes	A copy of the minutes will be forwarded to Ms Oelofse.
SP-IPP-RO	04/11/2010	<p>Ms R Oelofse raised various issues with regards to the proposed Powerline and Substation. The comment received by Ms Oelofse was based on the questionnaire which was made available to the Public for the Social Impact Assessment which is undertaken for the Powerline and substation projects. The full comment and issues letter obtained from Ms Oelofse are therefore not captured in the Issues and Response register, however, the full comments and issues letter received is attached to Appendix D and will be addressed in the Social Impact Assessment Reports as well as the EIA Report. The issues raised by Ms Oelofse are summarised below:</p> <ul style="list-style-type: none"> <li>• Raised various concerns with regards to health issues, i.e. the impact of EMF's on animals and humans, especially children;</li> <li>• Concerns with regards to safety during and after construction;</li> <li>• Concerns with regards to services and accommodation of construction workers;</li> <li>• Concern with regards to decrease in property values;</li> <li>• Concern with regards to visual impact. Is of the opinion that the study area will no longer be a place of peace and tranquillity; and</li> <li>• Concerned that the proposed projects may affect the livelihood of residents, especially farming activities and proposed future tourism development.</li> </ul>	<p>Ms Oelofse's comment has been noted. All issues raised will be addressed in the EIA and Social Impact Assessment Report. The following the response has been provided:</p> <ul style="list-style-type: none"> <li>• Eskom's lines are designed to meet international EMF standards and will therefore not cause any harmful EMF's. A full Electromagnetic Report undertaken for previous studies will be incorporated into the EIA Report.</li> <li>• All security and access control issues as well as details on maintenance of powerlines and servitudes as well as damage to fences and access gates are dealt with in the Environmental Management Plan. Specific landowner requirements and conditions will based on the aforementioned will form part of the negotiation process and agreements between Eskom and the landowner should be signed to ensure that landowner concerns and management measures are adhered to. A Social Impact Study will be done during the EIA Phase and the findings of this study will be included in the EIA Report.</li> <li>• Eskom acquires servitudes according to the Constitution and the Expropriation Act which states that actual financial loss must be paid, this value is determined by a registered independent land valuer and is a once off payment. The value takes all of the issues raised into consideration. Damage to crops is determined on actual damage during construction which is damage that must happen to create an area for a tower or for an access path for stringing conductors, and is paid at that time.</li> <li>• The exact location and number of contractor camps which will be required during the construction phase to house the construction workers is not yet known. The location of these camps forms part of landowner negotiations. Issues with</li> </ul>

Ref No:	Date Comment Received	Comment Raised	Response Given
			<p>regards to the provision of services to these camps will be addressed during the EIA Phase and details will be provided in the EIA Report; and</p> <ul style="list-style-type: none"><li>• A Visual Impact Assessment will be undertaken during the EIA Phase. The findings and recommendations of the Visual Impact Assessment will be incorporated into the EIA Report.</li></ul>

## 6.2 DRAFT SCOPING REPORT REVIEW NOTIFICATION

### 6.2.1 Stakeholder Review

The Draft Scoping Report was due for Public Review in accordance with Regulation 58(2) of Government Notice No. R. 385 of 21 April 2006, from the 1<sup>st</sup> of November 2010 until the 10<sup>th</sup> of December 2010. However, due to the high volume of technical content required from Eskom to address all the issues raised by stakeholders during the Public Meeting, the Public Review period of the Draft Reports were postponed. Notices were placed at the Public Review venues on the 1<sup>st</sup> of November 2010 to inform the Public of the postponement. Proof of notices placed is attached to Appendix D. On the 4<sup>th</sup> of November an amended notice was faxed to Laerskool Broederstroom and Hoërskool Brits to notify the Public of the second postponement. Proof of faxed notices is attached to Appendix D. The Madibeng and Schoemansville libraries amended the dates on the notice which was placed on the 1<sup>st</sup> of November 2010 as none of these libraries has access to a fax machine. A decision was made to postpone the Public Review period as it is important to accurately address all issues and concerns raised and comments made by all stakeholders as accurately as possible, and to provide as much technical information as possible regarding the project. E-mail notification was also sent to everyone on the Stakeholder database. Proof of e-mail notification is attached to Appendix D.

The Draft Scoping Report is available for review from the 8<sup>th</sup> of November 2010 until the 15<sup>th</sup> of December 2010, at the following venues:

Venue	Address	Contact No
Hoërskool Brits	1 Johan Street Brits	Adolf Gouws 012 252 3228
Laerskool Broederstroom	Plot 33, Primula Street, Flora Park	087 940 9167
Madibeng Community Library	51 Van Velden Street, Brits Office Hours: Mon-Fri: 09:00-17:00 Saturdays: 09:00-12:00	012 318 9318
Schoemansville Library	Marais Street, Schoemansville	012 253 1177

### 6.2.2 Authority Review

Copies of the Draft Scoping Report were submitted to the following authorities for review and comment during the same time as the Reports was made available for Public Review.

- Gauteng Department of Agriculture and Rural Development;
- North West Department of Agriculture, Conservation and Environment;
- Department of Water Affairs (DWA);
- National Department of Agriculture (NDA);
- Provincial Heritage Resources Authority, Gauteng;
- North West Provincial Heritage Resources Authority;
- Madibeng Local Municipality Environmental and Town Planning Departments; and
- City of Tshwane Local Municipality Environmental and Town Planning Departments.

Comment obtained from these authorities will be incorporated into the Final Scoping Report which will be submitted to DEA for review and decision making.

## 7 PLAN OF STUDY FOR EIA

The purpose of the EIA is to:

- Address issues that have been raised during the Scoping Phase;
- Assess alternatives to the proposed activity in a comparative manner;
- Assess all identified impacts and determine the significance for each impact; and
- Formulate mitigation measures.

The EIA Phase will consist of the following activities:

- Stakeholder engagement;
- Assessment of alternatives;
- Specialist Studies;
- Interaction of project design and baseline environmental criteria;
- Identification of potential impacts;
- Impact Assessment;
- Identification and description of mitigation measures; and
- Reporting and decision making.

These phases are described in more details below:



## 7.1 Stakeholder Engagement during the EIA

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The public participation process will be continued through the EIA phase for the proposed development to keep relevant Authorities and Interested and Affected Parties apprised on the decision of the Authorities regarding the Scoping Report, of the outcome of the specialist studies and the EIA for the proposed development.

During the EIA phase the following activities will be undertaken:

- Notification of I&AP's on Authority's decision regarding the Scoping Report, and notification that the EIA phase will commence, as well as details of the EIA phase;
- Registration of any additional stakeholders;
- Placement of newspaper advertisements in local and regional newspapers identified during the Scoping phase, for a duration of 2 weeks, notifying stakeholders of the availability of the Draft EIA Report for comment;
- Placement of onsite and community notices notifying the stakeholders of the availability of the Draft EIA Report for comment;
- Distribution of notification letters to all I&AP's informing them of the availability of the Draft EIA Report for comment;
- Hosting a Public Open Day to display project information and facilitate communication;
- Communication through letters, telephone calls and emails will be maintained with authorities and stakeholders throughout the process until a Record of Decision (ROD) is issued; and
- Steering committee meetings, if required, will be held throughout the EIA phase with Authorities until an ROD is issued.

The Draft EIA Report will be made available for review prior to submission. Comments received from the stakeholders will be included and addressed in the Final EIA Report. The Final EIA Report will then be submitted to DEA for review along with an Environmental Management Plan (EMP) for the proposed project.

## 7.2 Criteria for Assessing Environmental Issues, Alternatives and No-Go's

All issues raised will be screened according to the following criteria to determine the significance of the issue for further consideration during the EIA:

1. Availability and accuracy of existing information;
2. Level of detail required for decision-making;
3. Potential consequence of environmental impact;
4. Potential probability of environmental impact occurring;
5. Potential persistence of environmental impact once it has occurred;
6. Potential sensitivity of receiving environment; and
7. Potential risk to human health.

Each issue or potential impact identified will be rated on a scale from 1 to 5. Should the average rating exceed a value of 3, or should a rating of 5 be allocated for any one of the screening criteria the feasibility of a specialist study or further investigations will be triggered.

The following alternatives will be considered during the EIA:

- An assessment of the proposed land use against local council land use policies and sustainable development goals and objectives; and
- An assessment of site layout and design alternatives will be considered.

## 7.3 Specialist Studies

Specialists will be appointed to undertake the necessary specialist studies which has been identified in Section 6 above. Findings of these specialists' studies will be used to create sensitivity maps and no-go areas. It is envisaged that the specialist studies documented in Table 9 will be required.

**Table 21: Specialist studies to be undertaken during the detailed EIA phase.**

Specialist Study	Specialist Considered	Objective of the Study
Vegetation Assessment	Nemai Consulting	☞ Describe the fauna, and avifauna occurring in the study area.

Specialist Study	Specialist Considered	Objective of the Study
Fauna Assessment	Nemai Consulting	<ul style="list-style-type: none"> <li>➤ Describe the habitat integrity.</li> <li>➤ Identify the presence of or likelihood of occurrence of red data species.</li> <li>➤ Identify “no-go” and ecological sensitivity map.</li> </ul>
Avifaunal Assessment	Nemai Consulting	
Herpetological Assessment	To be confirmed	
Invertebrate Assessment	To be confirmed	
Soil and Land Capability Assessment	To be confirmed	<ul style="list-style-type: none"> <li>➤ Identify soil forms on site.</li> <li>➤ Compile a soil distribution map.</li> <li>➤ Identify soil disturbance on site.</li> <li>➤ Identify soil sensitivity, and erosion potential.</li> <li>➤ Identify suitable land capability categories.</li> <li>➤ Compile a land capability distribution map.</li> </ul>
Geological and Geotechnical Investigation	Eskom	<ul style="list-style-type: none"> <li>➤ Will form part of the Engineering Studies to be undertaken as part of the detailed design.</li> </ul>
Stormwater Management Plan	To be confirmed	<ul style="list-style-type: none"> <li>➤ Will form part of the Engineering Studies to be undertaken as part of the detailed design.</li> </ul>
Heritage Impact Assessment	To be confirmed	<ul style="list-style-type: none"> <li>➤ Identify whether any features occur on site which might have cultural or historical value;</li> <li>➤ Provide recommendations on development.</li> </ul>
Electromagnetic Survey	Previous Studies Completed	<ul style="list-style-type: none"> <li>➤ The findings of previous Electro Magnetic Studies will be assessed and included in the EIA Report.</li> </ul>

## 7.4 Environmental Impact Assessment

During the EIA Phase impacts will be ranked according to the methodology described below. Where possible, mitigation measures will be provided to manage impacts.

In order to ensure uniformity, a standard impact assessment methodology has been utilised so that a wide range of impacts can be compared. The impact assessment methodology makes provision for the assessment of impacts against the following criteria:

- significance;
- spatial scale;
- temporal scale;
- probability; and
- degree of certainty.

A combined quantitative and qualitative methodology was used to describe impacts for each of the aforementioned assessment criteria. A summary of each of the qualitative descriptors along with the equivalent quantitative rating scale for each of the aforementioned criteria is given in Table 22 below.

**Table 22: Quantitative rating and equivalent descriptors for each of the impact assessment criteria.**

RATING	SIGNIFICANCE	SPATIAL SCALE	TEMPORAL SCALE
1	VERY LOW	<i>Study area</i>	<u>Incidental</u>
2	LOW	<i>Local</i>	<u>Short-term</u>
3	MODERATE	<i>Regional</i>	<u>Medium-term</u>
4	HIGH	<i>National</i>	<u>Long-term</u>
5	VERY HIGH	<i>Global</i>	<u>Permanent</u>

A more detailed description of each of the assessment criteria is given in the following sections.

#### 7.4.1 Significance Assessment

Significance rating (importance) of the associated impacts embraces the notion of extent and magnitude, but does not always clearly define these since their importance in the rating scale is very relative. For example, the magnitude (i.e. the size) of area affected by atmospheric pollution may be extremely large (1000 km<sup>2</sup>) but the significance of this effect is dependent on the concentration or level of pollution. If the concentration is great, the significance of the impact would be HIGH or VERY HIGH, but if it is dilute it would be VERY LOW or LOW. Similarly, if 60 ha of a grassland type are destroyed the impact would be VERY HIGH if only 100 ha of that grassland type was known. The impact would be VERY LOW if the grassland type were common. A more detailed description of the impact significance rating scale is given in Table 23 below.

**Table 23: Description of the significance rating scale.**

RATING	DESCRIPTION
5 VERY HIGH	Of the highest order possible within the bounds of impacts which could occur. In the case of adverse impacts: there is no possible mitigation and/or remedial activity which could offset the impact. In the case of beneficial impacts, there is no real alternative to achieving this benefit.
4 HIGH	Impact is of substantial order within the bounds of impacts, which could occur. In the case of adverse impacts: mitigation and/or remedial activity is feasible but difficult, expensive, time-consuming or some combination of these. In the case of beneficial impacts, other means of achieving this benefit are feasible but they are more difficult, expensive, time-consuming or some combination of these.
3 MODERATE	Impact is real but not substantial in relation to other impacts, which might take effect within the bounds of those which could occur. In the case of adverse impacts:

RATING		DESCRIPTION
		mitigation and/or remedial activity are both feasible and fairly easily possible. In the case of beneficial impacts: other means of achieving this benefit are about equal in time, cost, effort, etc.
2	LOW	Impact is of a low order and therefore likely to have little real effect. In the case of adverse impacts: mitigation and/or remedial activity is either easily achieved or little will be required, or both. In the case of beneficial impacts, alternative means for achieving this benefit are likely to be easier, cheaper, more effective, less time consuming, or some combination of these.
1	VERY LOW	Impact is negligible within the bounds of impacts which could occur. In the case of adverse impacts, almost no mitigation and/or remedial activity is needed, and any minor steps which might be needed are easy, cheap, and simple. In the case of beneficial impacts, alternative means are almost all likely to be better, in one or a number of ways, than this means of achieving the benefit. Three additional categories must also be used where relevant. They are in addition to the category represented on the scale, and if used, will replace the scale.
0	NO IMPACT	There is no impact at all - not even a very low impact on a party or system.

#### 7.4.2 Spatial Scale

The spatial scale refers to the extent of the impact i.e. will the impact be felt at the local, regional, or global scale. The spatial assessment scale which will be used is described in more detail in Table 24.

**Table 24: Description of the Spatial Scale.**

RATING		DESCRIPTION
5	Global/National	The maximum extent of any impact.
4	Regional/Provincial	The spatial scale is moderate within the bounds of impacts possible, and will be felt at a regional scale (District Municipality to Provincial Level).
3	Local	The impact will affect an area up to 5 km from the proposed site.
2	Study Area	The impact will affect an area not exceeding the Boundary of the study site
1	Isolated Sites / proposed site	The impact will affect an area no bigger than the development footprint.

#### 7.4.3 Temporal Scale

In order to accurately describe the impact it is necessary to understand the duration and persistence of an impact on the environment. The temporal scale will be rated according to criteria set out in Table 25.

**Table 25: Description of the temporal rating scale.**

RATING		DESCRIPTION
1	Incidental	The impact will be limited to isolated incidences that are expected to occur very sporadically.
2	Short-term	The environmental impact identified will operate for the duration of the construction phase or a period of less than 5 years, whichever is the greater.
3	Medium term	The environmental impact identified will operate for the duration of life of plant.
4	Long term	The environmental impact identified will operate beyond the life of operation.
5	Permanent	The environmental impact will be permanent.

#### 7.4.4 Degree of Probability

Probability or likelihood of an impact occurring will be described in terms of the risk assessment procedure currently in use by the plant. The description of probability is shown in Table 26 below.

**Table 26 : Description of the degree of probability of an impact accruing**

RATING	DESCRIPTION
1	Practically impossible
2	Unlikely
3	Could happen
4	Very Likely
5	It's going to happen / has occurred

#### 7.4.5 Degree of Certainty

As with all studies it is not possible to be 100% certain of all facts, and for this reason a standard “degree of certainty” scale will be used as discussed in Table 27. The level of detail for specialist studies will be determined according to the degree of certainty required for decision-making. The impacts will be discussed in terms of affected parties or environmental components.

**Table 27: Description of the degree of certainty rating scale.**

RATING	DESCRIPTION
<b>Definite</b>	More than 90% sure of a particular fact.
<b>Probable</b>	Between 70 and 90% sure of a particular fact, or of the likelihood of that impact occurring.
<b>Possible</b>	Between 40 and 70% sure of a particular fact or of the likelihood of an impact occurring.

RATING	DESCRIPTION
Unsure	Less than 40% sure of a particular fact or the likelihood of an impact occurring.
Can't know	The consultant believes an assessment is not possible even with additional research.
Don't know	The consultant cannot, or is unwilling, to make an assessment given available information.

#### 7.4.6 Quantitative Description of Impacts

To allow for impacts to be described in a quantitative manner in addition to the qualitative description given above, a rating scale of between 1 and 5 will be used for each of the assessment criteria. Thus the total value of the impact is described as the function of significance, spatial and temporal scale as described below:

$$\text{Impact Risk} = \frac{(\text{SIGNIFICANCE} + \text{Spatial} + \text{Temporal}) \times \text{Probability}}{3 \quad \quad \quad 5}$$

An example of how this rating scale is applied is shown below:

IMPACT	SIGNIFICANCE	SPATIAL SCALE	TEMPORAL SCALE	PROBABILITY	RATING
	LOW	Local	Medium-term	Could Happen	
Impact to air	2	3	3	3	1.6

**Note:** The significance, spatial and temporal scales are added to give a total of 8, that is divided by 3 to give a criteria rating of 2,67. The probability (3) is divided by 5 to give a probability rating of 0,6. The criteria rating of 2,67 is then multiplied by the probability rating (0,6) to give the final rating of 1,6.

The impact risk is classified according to 5 classes as described in the table below.

**Table 28: Impact Risk Classes**

RATING	IMPACT CLASS	DESCRIPTION
0.1-1.0	1	Very Low
1.1-2.0	2	Low
2.1-3.0	3	Moderate
3.1-4.0	4	High
4.1-5.0	5	Very High

Therefore with reference to the example used for air quality above, an impact rating of 1.6 will fall in the Impact Class 2, which will be considered to be a low impact.

#### 7.4.7 Notation of Impacts

In order to make the report easier to read the following notation format is used to highlight the various components of the assessment:

Significance or magnitude- IN CAPITALS

Duration – in underline

Probability – in italics and underlined.

Degree of certainty - **in bold**

Spatial Scale – *in italics*

### 7.5 EIA Report

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The EIA Report will be compiled to satisfy the minimum requirements stipulated in Section 32 of Government Notice No. R. 385 of 21 April 2006. The EIA Report will consist of the following:

- A detailed description of the proposed development;
- A detailed description of the proposed development site;
- A description of the environment that may be affected by the activity and the manner in which physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed development;
- The methodology of the stakeholder engagement process will be described;
- The Issues Report and Stakeholder Database will be provided as an appendix to the EIA Report;
- A description of the need and desirability of the proposed development and the identified potential alternatives to the proposed activity;
- A summary of the methodology used in determining the significance of potential impacts;
- A description and comparative assessment of all alternatives identified during the Environmental Impact Assessment Process;
- A summary of the findings of the specialist studies;
- A detailed assessment of all identified potential impacts;
- A list of the assumptions, uncertainties and gaps in knowledge;
- An opinion by the consultant as to whether the development is suitable for approval within the proposed site;
- An environmental management plan that complies with regulation 34 of Act 107 of 1998;
- Copies of all specialist reports appended to the EIA report; and



- Any further information that will assist in decision making by the authorities.

## 7.6 Environmental Management Plan

The Environmental Management Plan will highlight the most significant potential impacts and provide mitigation measures for these impacts to ensure that the risk of impact is reduced and that the activity generating the impact is suitably managed. The EMP will include:

- Recommended management plans and detailed measures for environmental objectives identified to manage impacts, in order to facilitate the monitoring and control of the activity generating the impact;
- The identification of the responsible person for the mitigation and monitoring of impacts; and
- Suggest timeframes for monitoring programmes.

## 7.7 EIA Timeframes

The table below presents to proposed timeframes for the EIA process, which takes cognisance of DEA's proposed SID timeframes. Note that these dates are subject to change.

**Table 29: EIA Timeframes**

EIA Milestone	Proposed Timeframe
Public Review of draft Scoping Report	08/11/2010-15/12/2010
Submission of final Scoping Report to DEA	15/12/2010
Review of Scoping Report by DEA	15/12/2010-31/01/2011
Notification of Scoping Report decision and commencement of EIA	01/02/2011
EIA Public Participation	01/02/2011-10/03/2011
Public Review of draft EIA Report	14/02/2011-24/03/2011
Submit final EIA Report to DEA	28/03/2011
DEA Review & Decision	28/03/2011-28/06/2011
Notify I&APs of Decision	29/06/2011

**Note:** Dates may change during the course of the EIA process

## 8 ASSUMPTIONS, LIMITATIONS AND GAPS IN KNOWLEDGE

The following assumptions and limitations accompany the Scoping exercise for the proposed Anderson-Dinaledi 400 kV power line:

- It is accepted that the project motivation and description, as obtained from Eskom Transmission, is accurate.
- The exact locations of the towers and the route can only be determined following detailed design, and the environmental assessment is thus conducted for a 1 km corridor for each alternative alignment.
- It is assumed that the baseline information scrutinised and used to explain the environmental profile is accurate.

The limitations and gaps are as follows:

- The Scoping process did not include the possible locations of construction camps. The EIA phase will investigate the potential sites and impacts further.
- The type of tower structure is unknown at this stage, and is dependent on several factors, including terrain, expense and recommendations that emanate from the visual impact study, as well as the final route of the power line.
- Although existing access roads will be utilised as far as possible, the details of the access roads were not available during the compilation of the Scoping Report.

The screening of alternatives was primarily based on a desktop appraisal, with limited fieldwork, and feedback obtained from I&APs. A detailed screening exercise and comparative analysis from environmental and technical perspectives will be undertaken during the EIA phase.

## Appendix A: Proposed Site Layout Plan

**Appendix B: Curricula Vitae of EAPs**  
**(Please note that the Curricula Vitae will only be  
attached to the Final Scoping Report)**

## Appendix C: Authority Correspondence

## **Appendix D: Stakeholder Engagement Documentation**

## Appendix E: Public Review of Draft Scoping Report

## **Appendix F: List of Bird Species Occurring within Quarter Degree Squares 2527DB and 2527DD**