

October 2008  
Scoping Phase

ENVIRONMENTAL IMPACT  
ASSESSMENT

*Bravo Integration Project – Bravo 4:  
Construction of two 400 kV Power  
Lines from Kendal Power Station to  
Zeus Substation*

DEAT REF NO: 12/12/20/1095

**Proponent: Eskom Transmission**

---

**FINAL SCOPING REPORT**

---

Project 10637

## PURPOSE OF THIS DOCUMENT

The growing demand for electricity is placing increasing pressure on Eskom's existing power generation and transmission capacity. Eskom are committed to implementing a Sustainable Energy Strategy that complements the policies and strategies of National Government. Eskom aims to improve the reliability of electricity supply to the country, and in particular to provide for the growth in electricity demand in the Gauteng and Mpumalanga provinces. For this reason, Eskom obtained environmental authorisation to construct the new 400 kV Bravo (Kusile) Power Station between Bronkhorstspuit and Witbank in 2007. Construction of this power station has already commenced.

The new Bravo power station needs to be integrated with the existing Eskom electricity infrastructure. This proposed project is to construct a two new 400 kV overhead power lines from the Kendal Power Station to the Zeus Substation. Each of these lines, running parallel to each other, will be approximately 90 km in length.

Eskom Transmission has appointed Zitholele Consulting (Pty) Ltd, an independent company, to conduct an EIA to evaluate the potential environmental and social impacts of the proposed project.

The first phase of an EIA is the Scoping Phase. This is the phase during which public issues, concerns and suggestions are identified so that they can be evaluated by the EIA technical specialists during the next phase (the Impact Assessment Phase) of the EIA.

According to the EIA Regulations, interested and affected parties must have the opportunity to comment on the proposed project and verify that all the issues raised during the Scoping Phase have been recorded. This is the main purpose of the Draft Scoping Report, which was made available for comment during the period 30 July to 30 August 2008. This report constitutes the Final Scoping Report which will be submitted to the Department of Environmental Affairs and Tourism (DEAT) for approval, prior to proceeding with the Environmental Impact Assessment Phase of the Project. This report is due for submission on the **20th of October 2008**.

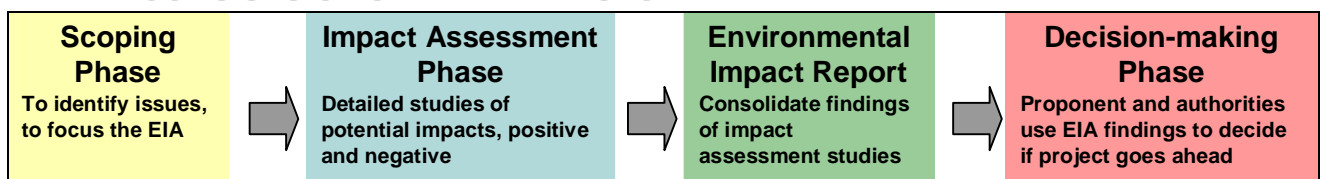
Interested and affected parties will also have an opportunity to comment on the findings of the EIA, which will be presented in a draft Environmental Impact Report (EIR). After public review, the Draft EIR will be updated and submitted to the lead authority, the National Department of Environmental Affairs and Tourism for a decision about the project.

### Summary of what the Final Scoping Report Contains

This report contains the following for comment by stakeholders:

- The background and description to the proposed project
- An overview of the EIA process, including the public participation process
- A description of the existing environment in the project area
- The potential environmental issues and impacts which have already been identified
- The terms of reference for the specialist studies
- A list of comments raised to date.

### AN EIA CONSISTS OF SEVERAL PHASES



## TABLE OF CONTENTS

SECTION	PAGE
1	INTRODUCTION..... 1
1.1	Who is the proponent?..... 1
1.2	Electricity Generation and Distribution ..... 1
1.3	Increased Electricity Supply Plan..... 2
1.4	Bravo Integration Project ..... 3
1.5	Context of this Report..... 4
1.6	Legal Requirements ..... 4
1.7	Environmental Impact Assessment Practitioner (EAP)..... 7
1.8	EAP Contact details..... 7
1.9	Objectives of this report..... 8
2	PROJECT DETAILS..... 9
2.1	Alternatives Considered..... 9
2.2	Project Alternatives..... 9
2.3	Design Alternatives..... 9
2.4	Preferred Project Description – Alternative 2 ..... 11
2.5	Major Activities of the Project..... 11
2.6	Project Schedule ..... 13
3	RECEIVING ENVIRONMENT ..... 15
3.1	Topography and land-use..... 15
3.2	Geology and Drainage Features ..... 17
3.3	Climate ..... 17
3.4	Infrastructure ..... 19
3.5	Ecology ..... 19
3.6	Cultural and historical resources..... 22
4	SCOPING PROCESS..... 25
4.1	Technical Process ..... 25
4.2	Public Participation Process ..... 26
5	ENVIRONMENTAL IMPACT ASSESSMENT ..... 32
6	PLAN OF STUDY FOR EIA..... 35
6.1	Technical Process ..... 35
6.2	Public Participation ..... 38
7	CONCLUSION AND WAY FORWARD..... 40

### LIST OF FIGURES

Figure 1: Map showing the proposed study area.....	14
Figure 2. Land Cover of the study and surrounding areas .....	16
Figure 3. Surface water and drainage features of the area .....	18
Figure 5. Vegetation of the area .....	21
Figure 6. Sensitive fauna and flora (Terrestrial Diversity) .....	23

Figure 7. Sensitive fauna and flora (Aquatic Biodiversity).....	24
---	----

Figure 7. Technical and public participation process and activities that comprise the Environmental Impact Assessment for the proposed new 400kV power lines from Kendal Power Station to Zeus Substation.....	27
--	----

## LIST OF TABLES

Table 1: Primary milestones for the Bravo 4: Two 400kV Power lines from Kendal Power Station to Zeus Substation. ....	13
---	----

Table 2: Advertisements placed during the announcement phase. ....	28
--	----

Table 3: List of stakeholder meetings that were advertised as part of the public review period of the Draft Scoping Report.....	29
---	----

Table 4. List of public places where the Draft Scoping Report is available .....	30
--	----

Table 6: Potential Environmental Impacts to be investigated in the EIA phase.....	32
---	----

## LIST OF APPENDICES

Appendix A	EAP CV
Appendix B	EIA Application Form
Appendix C	Landowner Consent Forms
Appendix D	Newspaper Advertisements and Site Notices
Appendix E	Project Location Map
Appendix F	I&AP Database
Appendix G	Issues and Response Report
Appendix H	Background Information Document
Appendix I	Minutes of the Public Meeting

## 1 INTRODUCTION

### 1.1 Who is the proponent?

Eskom Holdings is South African utility that generates, transmits and distributes electricity. Eskom supplies ~95% of the country's electricity, and ~60% of the total electricity consumed on the African continent. Eskom's vision "*Together building the powerbase for sustainable growth and development.*"<sup>1</sup> places a responsibility on the company to ensure that sustainable development in the country becomes a reality. Eskom further plays a major role in accelerating growth in the South African economy by providing a high-quality supply of electricity. Eskom's vision means:<sup>1</sup>

Together	One Eskom, unified, working together in partnership with others
Building	Planning for the future, building South Africa's economy
Powerbase	Providing the electricity foundation for positive sustainable development
Sustainable	Ensuring continued delivery on economic, environmental and social outcomes
Growth	Empowering South Africa, its people and the economy
Development	Securing a brighter future for all and integrating the first and second economy

The details of the proponent are as follows:

Company: Eskom Transmission: Land and Rights

Contact: Project Manager: Mr Vuledzani Thanyani

Address: Eskom Transmission, Mega Watt Park, Maxwell Drive, Sunninghill

Landline: 011 800 5601

Fax: 011 800 3917

For more information regarding Eskom please refer to the Eskom website at [www.eskom.co.za](http://www.eskom.co.za).

### 1.2 Electricity Generation and Distribution

In South Africa, our most abundant source of energy is coal. Eskom therefore relies on coal fired power stations to produce approximately 90% of its electricity. Coal mining in South Africa is relatively cheap compared to the rest of the world. In Europe, by contrast, costs are almost four times higher.

---

<sup>1</sup> Taken from the Eskom website, 27 August 2008 ([http://www.eskom.co.za/live/content.php?Category\\_ID=58](http://www.eskom.co.za/live/content.php?Category_ID=58))

In order for the electricity generated by these power stations to be transmitted safely and efficiently, it must be at a high voltage (Typically 400 kilo Volts [kV]) and a low current. The transmission system carries the electricity from source (power stations) to consumption areas.

Electricity delivered by transmission circuits is then stepped down in facilities called substations to voltages more suitable for use. At distribution substations electricity is stepped down to 11kV for local distribution and then further reduced according to need, for example, 220 volts for domestic use. Substations are used to transform power from one voltage level to another; interconnect alternative sources of power; connect generators, transmission or distribution lines and loads to each other, as well as provide switching for alternate connections and isolation of failed or overloaded lines and equipment. Substations are also used to interconnect adjacent power systems for mutual assistance in case of emergency.

### **1.3 Increased Electricity Supply Plan**

For many years Eskom has operated in an environment of surplus capacity. However, this surplus capacity has now been exhausted with increased consumer demand. Eskom's power system will remain tight over the next five years with an increased likelihood of power interruptions. This trend is set to continue at least until the first new coal-fired base load power station (Medupi power station) is commissioned in 2011.

During the Integrated Strategic Electricity Planning (ISEP) process Eskom identified long-term options regarding both the supply and demand sides of electricity provision in South Africa. The ISEP is informed by the White Paper on the Energy Policy of the Republic of South Africa (1998), the Integrated Energy Plan (2003) and the National Integrated Resource Plan (2003/ 2004).

The latest ISEP (October 2005) has identified the need for increased base load electricity supply by the year 2010, while peaking generation is being attended to in the shorter term. The National Energy Regulator of South Africa (NERSA) is the regulatory authority responsible for the electricity supply industry in South Africa. In its National Integrated Resource Plan (NIRP), NERSA has determined that, while various alternative and renewable electricity generation options should be continually investigated, coal should still provide the main fuel source in South Africa. Accordingly, coal-fired power stations will be required for the expansion of generation capacity during the next 20 years.

On 29 February 2008 Eskom awarded contracts for its "Bravo Project", a coal-fired power station to be built near Emalahleni in Mpumalanga by 2017. Site clearance for this station has already started. The first unit is planned to be online by 2013.

Since the Bravo power station will aid in the delivery of additional electricity supply, the proposed Bravo Integration Project is necessary to integrate and connect Bravo power station into the existing Eskom electricity network.

For additional information on the Eskom build programme, or increased electricity supply plan, please visit the Eskom website: [http://www.eskom.co.za/live/content.php?Item\\_ID=5981&Revision=en/2](http://www.eskom.co.za/live/content.php?Item_ID=5981&Revision=en/2).

## **1.4 Bravo Integration Project**

The Bravo Integration project consists of the following five components:

### **1.4.1 Phase 1: Sol – Camden By-Pass Power Line**

The intention of Bravo 1 is to build two 400kV bypasses lines for Zeus substation, the two 400kV lines from Sol Substation and the two 400 kV power lines from Camden power station will be disconnected from Zeus substation and joined to each other to form two Camden- Sol 400 kV power lines. The location of the two by-pass lines is planned to be within approximately 10km radius of the Zeus substation. The project is located within the Govan Mbeki District Municipality.

### **1.4.2 Phase 2: Apollo and Kendal loop in and loop out lines**

Eskom propose to construct four new 400 kV overhead power lines, located within the Emalahleni Local Municipality in Mpumalanga, to loop in and out of Bravo Power Station. The existing Kendal-Apollo line will be looped in and out of Bravo to form the Bravo-Apollo and Bravo-Kendal lines. In addition, the existing Duvha-Minerva 400 kV overhead power line will be looped in and out of Bravo Power Station, to form the Bravo-Duvha and Bravo-Minerva lines. The study area in which the alternatives were selected is within the 10 km radius surrounding the new Bravo Power Station and each of the alternative 400kV power lines will be not exceed 1km in length.

### **1.4.3 Phase 3: Construction of a 400kV power line from Bravo Power Station to Lulamisa Substation**

In order for the Bravo power station to be integrated within the existing Eskom infrastructure, Eskom propose to construct a new 400kV power line from the new Bravo Power Station to the Existing Lulamisa substation, near Diepsloot. This line will be approximately 150 km in length. The construction of this proposed 400kV power line is aimed to ensure sufficient electricity supply to the Diepsloot and Johannesburg North areas, where currently frequent electricity shortages are experienced. The alternative Bravo power line corridors are located on the eastern Highveld of Southern Africa. The corridors cover an area from Witbank in the east, to Diepsloot in the west.

### **1.4.4 Phase 4: Two New 90 km Kendal –Zeus 400 kV Power Lines**

Eskom propose to construct two new 400 kV power lines, one from Bravo to Zeus and the other one from the Kendal Power Station (near Ogies) to the Zeus substation (near Secunda), Mpumalanga. These lines will run parallel to each other and will be approximately 90 km in length. The three alternative route corridors will be 5 km wide. These three alternative corridors merge into two corridors approximately 30 kms from the Zeus substation.

### **1.4.5 Phase 5: New 10km Bravo-Vulcan Power Line**

Eskom propose to construct a 400 kV overhead power line, by-passing the existing Duvha substation, to form a new Bravo-Vulcan line near Middelburg, Mpumalanga. This by-pass line is planned to be approximately 10 km. The area to be investigated for this by-pass line is a 10km radius surrounding the existing Duvha substation.

## **1.5 Context of this Report**

This report constitutes the Final Scoping Report, a key component of the Environmental Authorisation Process for **Phase 4: Construction of a two new 400kV overhead power line between Kendal Power Station and Zeus Substation.**

## **1.6 Legal Requirements**

### **1.6.1 National Environmental Management Act (No 107 of 1998)**

The EIA for this proposed project will be conducted in terms of the EIA Regulations that were promulgated in terms of Section 24 (5) of the NEMA. The National Department of Environmental Affairs and Tourism (DEAT) is the competent authority responsible for issuing environmental authorisation for the proposed project. A full EIA is applicable to all projects likely to have significant environmental impacts due to their nature or extent, activities associated with potentially high levels of environmental degradation, or activities for which the impacts cannot be easily predicted. In terms of Government Notice Regulation (GNR) 387, activity 1(l), a full Environmental Impact Assessment comprising both Scoping and impact assessment, is necessary for the proposed new 400kV overhead power lines. This activity is listed as follows:

- Activity 1(l): The transmission and distribution of above ground electricity with a capacity of 120 kilovolts or more.

The following activities in accordance with Regulation GNR 386 are also included in the EIA application, to provide for supporting infrastructure associated with the proposed power lines construction:

- Activity 1 (p): The temporary storage of hazardous waste;
- Activity 12: The transformation or removal of indigenous vegetation of three hectares or more, or of any size where the transformation or removal would occur within a critically endangered ecosystem listed in terms of section 52 of the National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004);
- Activity 14: The construction of masts of any material of type and of any height, including those used for telecommunications, broadcasting and radio transmission, but excluding (a) masts of 15m and lower exclusively used by



- 
- (i) radio amateurs; or (ii) for lighting purposes, (b) flagpoles; and (c) lightning conductor poles;
- Activity 15: The construction of a road that is wider than four metres or that has a reserve wider than six metres, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30 metres long;
  - Activity 16 (b): The transformation of undeveloped, vacant or derelict land for residential, industrial or institutional use where such development does not constitute infill and where the total area to be transformed is bigger than one hectare; and
  - Activity 23: The decommissioning of existing facilities or infrastructure, other than facilities or infrastructure that commenced under an environmental authorization issued 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, for -. (a) electricity generation

### **1.6.2 Additional legal requirements and framework**

#### White Paper on the Energy Policy of the Republic of South Africa – 1998

Development within the energy sector in South Africa is guided by the White Paper on the Energy Policy, published by DME in 1998. This White Paper sets out five objectives for the further development of the energy sector. The five objectives are as follows:

- Increased access to affordable energy services;
- Improved energy governance;
- Stimulating economic development;
- Managing energy-related environmental and health impacts; and
- Securing supply through diversity.

Furthermore, the Energy Policy identified the need to undertake an Integrated Energy Planning (IEP) process in order to achieve a balance between energy demand and resource availability, whilst taking into account health, safety and environmental aspects. In addition, the policy identified the need for the adoption of a National Integrated Resource Planning (NIRP) approach to provide a long-term cost-effective resource plan for meeting electricity demand, which is consistent with reliable electricity supply and environmental, social and economic policies.

#### Integrated Energy Plan (IEP) – 2003

DME commissioned the IEP to provide a framework in which specific energy policies, development decisions and energy supply trade-offs can be made on a project-by-project basis. The framework is intended to create a balance in providing low cost electricity for social and economic development, ensuring security of supply and minimizing the associated environmental impacts. The IEP projected

that the additional demand in electricity would necessitate an increase in electricity generation capacity in South Africa by 2007. Furthermore, the IEP concluded that, based on energy resources available in South Africa, coal will be the primary fuel source for the current expansion period.

#### National Integrated Resource Plan (NIRP) – 2003/2004

In response to the White Paper's objective relating to affordable energy services, the National Electricity Regulator (now NERSA) commissioned a NIRP. The objectives of the NIRP are to determine the least-cost supply option for the country, provide information on the opportunities for investment into new power stations and evaluate the security of supply.

The national electricity demand forecast took a number of factors into account. They are:

- A 2.8% average annual economic growth;
- The development and expansion of a number of large energy-intensive industrial projects;
- Electrification needs;
- A reduction in electricity-intensive industries over the 20 year planning horizon;
- A reduction in electricity consumers – NIRP anticipates people switching to the direct use of natural gas;
- The supply of electricity to large mining and industrial projects in Namibia and Mozambique; and
- Typical demand profiles.

### **1.6.3 Legal requirements in terms of other Acts**

In addition to the ECA and NEMA, the following Acts have some bearing on the proposed activities:

#### The National Heritage Resources Act (No. 25 of 1999)

The proposed overhead power lines comprise certain activities (e.g. changing the nature of a site exceeding 5 000 m<sup>2</sup> and linear developments in excess of 300 m) that require authorisation in terms of Section 38 (1) of the Act. Section 38 (8) of the Act states that, if heritage considerations are taken into account as part of an application process undertaken in terms of the ECA, there is no need to undertake a separate application in terms of the National Heritage Resources Act. The requirements of the National Heritage Resources Act have thus been addressed as an element of the EIA process, specifically by the inclusion of a Heritage Assessment.

#### Expropriation Act (No. 63 of 1975)

Eskom has a policy of "willing buyer, willing seller", and therefore endeavors to purchase land where ever possible or necessary. However, the State and State-owned-enterprises can acquire the rights to use or possess the requisite land through the Expropriation Act (No 63 of 1975). The Expropriation

Act requires the determination of compensation based on the principle of market value (i.e. what would the value be in the event of both a willing buyer and a willing seller trading the land). There is a suite of additional legislation, which, in conjunction with the Expropriation Act, would be used to determine the compensation value.

### **1.7 Environmental Impact Assessment Practitioner (EAP)**

Eskom appointed Zitholele Consulting, an independent consultancy, to undertake the EIA for the Phase 4: Construction of two new 400kV power lines from Kendal Power Station to Zeus Substation, in accordance with the EIA Regulations promulgated in April 2006 in terms of the National Environmental Management Act ([NEMA] No 107 of 1998). The Regulations became effective on 1 July 2006.

Zitholele Consulting is an empowerment company formed to provide specialist consulting services primarily to the public sector in the fields of Water Engineering, Integrated Water Resource Management, Environmental and Waste Services, Communication (public participation and awareness creation) and Livelihoods and Economic Development. The company was established to promote new opportunities for and to increase the level of participation by historically disadvantaged individuals (HDI) in the ownership, management and control of economic activities. Solly Manyaka is the Managing Director and majority (41%) shareholder of Zitholele Consulting, Mr Charles Naidoo of Zitholele is a 10% shareholder, with Golder Associates Africa holding 49% of shares. Apart from majority black shareholding, the company is staffed by HDI professionals, technical specialists and competent senior management members.

Zitholele Consulting has no vested interest in the proposed project and hereby declares its independence as required by the EIA Regulations.

### **1.8 EAP Contact details**

In terms of the NEMA the proponent must appoint an Environmental Assessment Practitioner (EAP) to undertake the environmental assessment of an activity regulated in terms of the aforementioned Act. The details of the EAP are listed below.

Name:	Warren Kok
Company Represented:	Zitholele Consulting (Pty) Ltd.
Address:	P O Box 6002, Halfway House, 1685
Telephone:	011 254 4932
Fax:	011 805 2100
E-mail:	<a href="mailto:warren@cymbian.co.za">warren@cymbian.co.za</a>

A *curriculum vitae* of the EAP is provided in Appendix A.

### **1.9 Objectives of this report**

This report addresses the requirements of the Scoping and impact assessment procedure as outlined in the NEMA regulations. The aim of this Final Scoping Report (FSR) is to:

- Provide information to the authorities and interested and affected parties on the proposed project;
- Provide information regarding alternatives that have been considered;
- Indicate how interested and affected parties were afforded the opportunity to contribute to the project, verify that the issues they raised were considered, and comment on the findings of the impact assessments;
- Describe the baseline receiving environment;
- Present the findings of the Scoping Phase in a manner that facilitates decision-making by the relevant authorities.

---

## 2 PROJECT DETAILS

### 2.1 Alternatives Considered

During the planning phase the following alternatives were considered:

- Project Alternatives;
- Design Alternatives;
- Route Alternatives; and
- The No-Go Alternative

### 2.2 Project Alternatives

Several strategic alternatives were considered at the conceptual phase of the Bravo Power Station EIA. This strategic information was again revisited during the planning phase of the Bravo Integration Project.

### 2.3 Design Alternatives

#### Underground vs. Overhead Power Lines

The primary motivating factors behind the selection below ground power lines include the following:

- 1.) Areas prone to significant infrastructure damage due to extreme weather conditions, on an annual basis, usually consider underground power lines. The cost of power line replacement over the life of the infrastructure is usually more cost effective in such areas;
- 2.) The visual impact of underground power lines is much less than those of overhead power lines, and are usually considered in highly sensitive visual landscapes, such as wide open wilderness spaces and tourism facilities e.g. game farms and nature reserves.

The primary motivating factors behind the selection overhead power lines include the following:

- 1.) The cost of overhead lines is between 250% and 400% less. Eskom have a responsibility to provide cost effective and reliable energy resources;
- 2.) Overhead circuits can often be worked on while they are still energized. Nearly all work on underground circuits is performed while things are de-energized and grounded.
- 3.) Underground cables need a larger conductor to handle the same amperage as a smaller overhead conductor. This is due to the difficulty of dissipating heat to the earth. Larger conductors means higher cost.

- 4.) Overhead distribution circuits are much easier to modify to serve customers or make other changes. A simple set of fuses on an overhead circuit might cost ~R2 000,00, yet the underground equivalent costs over ~R10 000,00.
- 5.) An overhead line can generally span and not disturb sensitive features such as cultural resources sites, streams, most wetlands, isolated steep slopes, or a sensitive species location to mention a few. Underground lines however require the construction of a trench and results in a disturbed area of approximately 15m in width for the entire length of the line.

As none of the areas affected by the proposed Bravo Integration Project are annually affected by extremely damaging environmental events, or fall within highly sensitive visual environments it was decided to implement the more cost effective overhead power line alternative.

### Tower Design

The following types of towers may be used on this project:

- Cross rope suspension tower.
- Compact cross rope suspension tower.
- Guyed-V suspension tower.
- Self-supporting suspension tower.
- Self-supporting strain tower.

This will be evaluated further in the EIA Phase of the project.

### **2.3.1 Route Alternatives**

The various route alternative corridors of approximately 5km were analysed and will be assessed during this EIA. These three alternative corridors have been selected considering existing environmental information, engineering feasibilities as well as existing Eskom servitudes power lines. The following 3 alternatives were identified (Figure 1). The 3 alternative routes merge into 2 corridors 30km from the Zeus substation, since there is an existing 400kV Eskom servitude present.

#### Alternative 1:

Alternative 1 is to construct the two proposed 400kV power lines, running parallel, approximately 76.6 km from Zeus Substation to Kendal Power Station. This proposed line will run furthest to the west as illustrated in Figure 1. This alternative is the longest alternative, and will be outside of Eskom property.

### Alternative 2:

Alternative 2 is to construct the two proposed 400kV power lines, running parallel, approximately 70.6 km from Zeus Substation to Kendal Power Station. The line will follow the same corridor as alternative 1 for the first 60 km's and later divert as the crow flies towards the Zeus substation for 30kms. This alternative is currently the preferred alternative.

### Alternative 3:

Alternative 3 is to construct the two proposed 400kV power lines, running parallel, approximately 63.2 km from Zeus Substation to Kendal Power Station. This alternative will lead to a shorter power line length and is the alternative furthest to the east of the area as illustrated in Figure 1.

### The No-Go Alternative

The No-Go alternative will also be assessed further in the EIA. In the case that none of the three alternatives is suitable for the proposed power lines, the recommendation would be that the proposed power line not be constructed and further alternative alignments, or project solutions be generated.

## **2.4 Preferred Project Description – Alternative 2**

### **2.4.1 Route Alignment and Length**

The length of the two new 400kV power lines will be approximately 70.6 km. The preferred Route Alignment is currently Alternative 2 as shown on Figure 1.

### **2.4.2 Construction area**

The servitude width is 55m. Construction activities will be limited to the width of the servitude in which the line will be constructed. The power line servitude will be placed within a 5km corridor identified at during the EIA phase of the project. The exact route alignment will be determined during the detailed phase of the engineering for the project, and will be governed by the EMP compiled for the EIA for this project.

### **2.4.3 Tower Parameters and Design**

During the detailed EIA phase of the project the following information will be determined with regard to electrical towers: Tower spacing and positions, tower type, tower height, conductor attachment height, and conductor type. A likely cross sectional profile of the servitude and probable tower design will be included in the EIA.

## **2.5 Major Activities of the Project**

The project involves 21 major activities:

1. Environmental Impact Study.
2. Negotiations for the servitude.
3. Land survey to determine the exact routing of the line and tower placement.
4. Profiling work to produce the profiles for construction.
5. Pegging of bend tower by a Transmission surveyor.
6. Erection of camp sites for the Contractors' workforce.
7. Negotiations with landowners for access roads to the servitude.
8. Servitude gate installation to facilitate access to the servitude.
9. Vegetation clearing to facilitate access, construction and the safe operation of the line.
10. Establishing of access roads on the servitude where required as per design parameters in TRMSCAAC1 rev 3.
11. Pegging of tower positions for construction by the contractor.
12. Transportation of equipment, materials and personnel to site and stores.
13. Installation of foundations for the towers.
14. Tower assembly and erection.
15. Conductor stringing and regulation.
16. Taking over the line from the contractor for commissioning.
17. Final inspection of the line, commissioning and hand over to the Grid Line and Servitude Manager for operation.
18. Rehabilitation of disturbed areas.
19. Signing off of all Landowners upon completion of the construction and rehabilitation.
20. Handing over and taking over of the servitude by the Grid Environmental Manager.
21. Operation and maintenance of the line by the Grid.



## 2.6 Project Schedule

The primary milestones for the Bravo 4: Construction of two new 400kV power lines from Kendal Power Station to Zeus Substation is described in Table 1 below.

**Table 1: Primary milestones for the Bravo 4: Two 400kV Power lines from Kendal Power Station to Zeus Substation.**

Milestones	Date
Final Scoping Report	20 October 2008
Undertake Specialist Studies	15 January 2008
Draft EIR and EMP	10 February 2009
Stakeholder Engagement on EIR / EMP	11 March 2009
Finalise EIR and EMP	6 April 2009
Submission to Relevant Authorities	7 April 2009
Environmental Authorisation	19 May 2009
Appeal Period	21 July 2009
Commence with Construction	To be advised
Construction (including EMP Auditing)	To be advised
Completion of Construction (including Rehabilitation)	To be advised
Close out Audit	To be advised

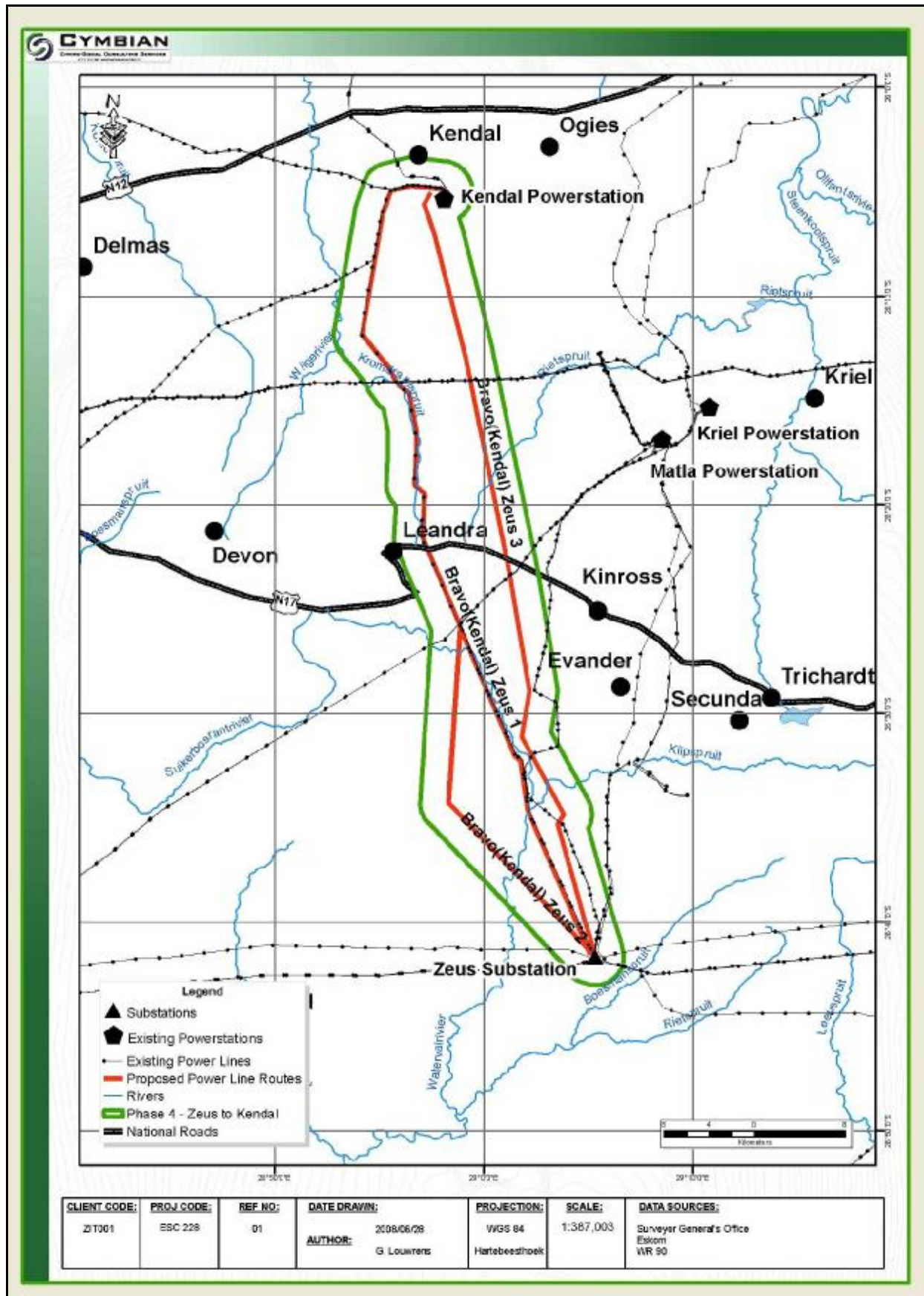


Figure 1: Map showing the proposed study area.

---

### **3 RECEIVING ENVIRONMENT**

#### **3.1 Topography and land-use**

##### **3.1.1 Methodology and Data Sources**

The topography of the area was taken from the Surveyor General 1:50 000 topocadastral map sheets of the area (2628 BB, BD, DB and 2629 AA, AC, CA). Land use was determined utilising a GIS desktop study, the data was obtained from the Council for Scientific and Industrial Research (CSIR) Land Cover database.

##### **3.1.2 Regional Description**

The topography of the area is gently undulating to moderately undulating landscape of the Highveld plateau. Some small scattered wetlands and pans occur in the area, rocky outcrops and ridges also form part of significant landscape features in the area. Altitude ranges between 1420-1760 mamsl.

Land-Use is dominated by maize and sunflower farming, coal mines and power stations. Land use of the region is grouped into urban, cultivation, grassland / plantations, mines and quarries and waterbodies / wetlands. As can be seen from Figure 2 below, the proposed route traverse mainly cultivation and grassland / plantation land uses, as well as a number of waterbodies / wetlands and a small area of mining land use.

##### **3.1.3 Sensitivities**

As mentioned above, wetlands and ridges occur in the area. Wetlands provide important ecosystem goods and services such as flood attenuation, regulating water flow, recharging groundwater and purifying and removing pollutants from water. Wetlands also provide habitat to a large number of species, many of which are important economically.

Ridges are considered sensitive because ridges and the area immediately surrounding them provide habitat for a wide variety of fauna and flora, some of which are Red Data List, rare or endemic species, they also perform functions that are necessary for the sustainability of ecosystems such as the recharging of groundwater, wetlands and rivers, wildlife dispersal and habitat for essential pollinators. Ridges also fulfill a socio-cultural role in that they provide aesthetically pleasing environments or ecosystems.

Mines / quarries and waterbodies should be avoided, should it not be feasible to avoid these management and mitigatory measures will be outlined in the EIA and EMP.





## **3.2 Geology and Drainage Features**

### **3.2.1 Methodology and Data Sources**

A desktop screening assessment, using a Geographic Information System (GIS) tool, was undertaken of the geological environment. The geological data was taken from the Environmental Potential Atlas Data (ENPAT) from the Department of Environmental Affairs and Tourism (DEAT) as well as geological data supplied by the Gauteng Department of Agriculture, Conservation and Environment (GDACE). Surface water data was taken from the WR90 Data supplied by the Department of Water Affairs and Forestry (DWAF) as well as GDACE.

### **3.2.2 Regional Description**

The soils of the region surrounding the Kendal Power station are generally red to yellow sandy soils found on shales and sandstone or mudstone of the Madzaringwe Formation (Karoo Supergroup), or the intrusive Karoo Suite dolerites which feature prominently in the area.

Shale, sandstone or mudstone of the Madzaringwe Formation (Karoo Supergroup) is also found in the region surrounding Zeus Substation. The geology of the region is also characterized by the Volksrust Formation (Karoo Supergroup) to the south and to the west by rocks of the older Transvaal, Ventersdorp and Witerwatersrand Supergroups. Soils are deep, reddish on flat plains.

Minerals and metals found in the area are flint, iron, gold, molybdenite, cobalt, and malachite (Emalahleni Local Municipality Spatial Development Framework, 2005).

The proposed power lines will intersect a number of watercourses including the Kromdraaispruit, the Rietspruit, the Klipspruit and the Waterval River and will also traverse a number of catchments namely B11E, B11F, B20E, B20F, C12D, C12E, and C12F, see Figure 3 below.

### **3.2.3 Sensitivities**

All surface water bodies are earmarked as sensitive features and should be avoided as far as possible. The wetland demarcation will be undertaken as part of the specialist studies during the EIA phase.

## **3.3 Climate**

### **3.3.1 Methodology and Data Sources**

Climate information was attained using the Climate of South Africa database, Land Types of the Maps 2526 Rustenburg, 2528 Pretoria (Land Type Survey Staff 1987), as well as from The Vegetation of South Africa, Lesotho and Swaziland (Mucina and Rutherford 2006).



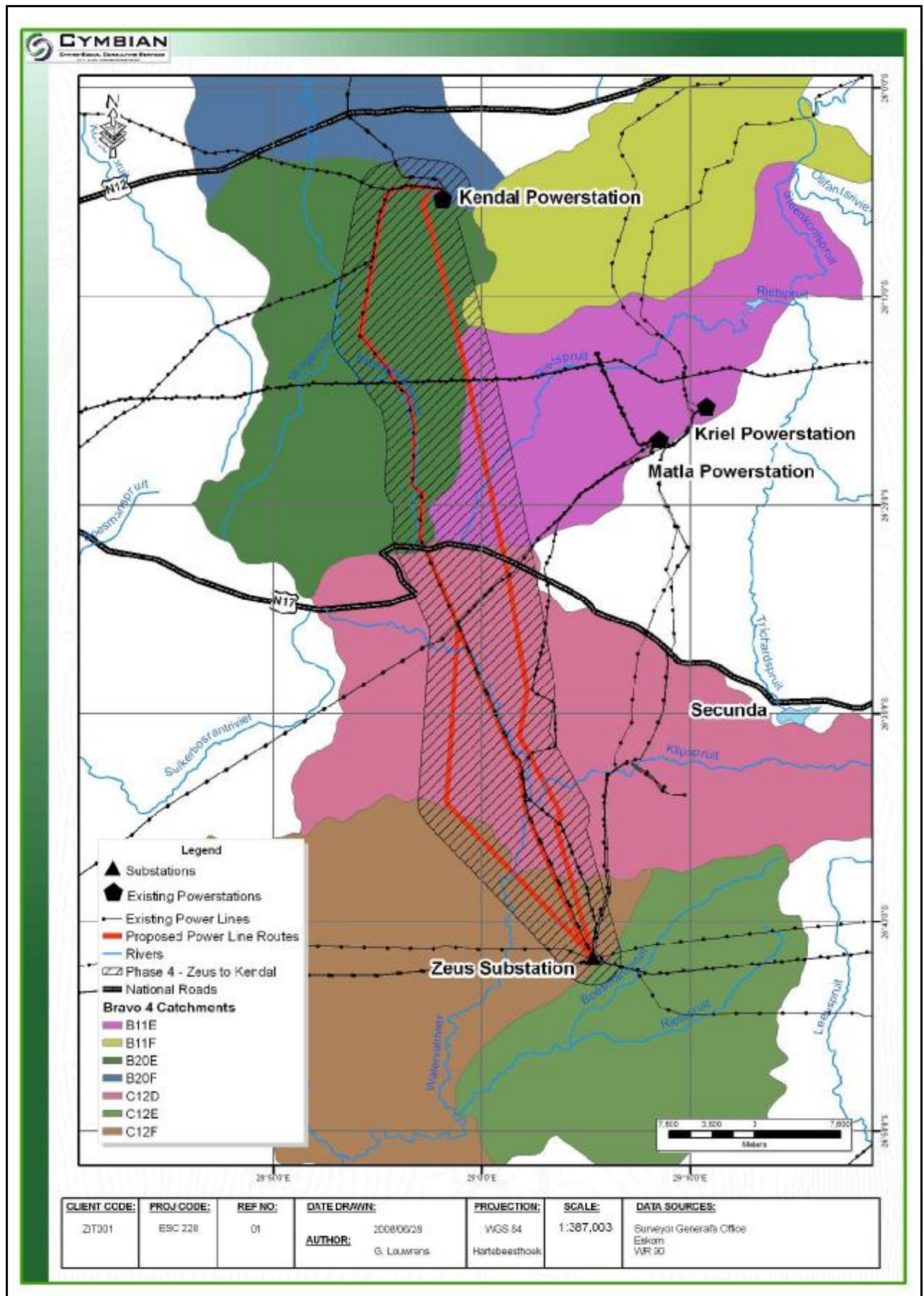


Figure 3. Surface water and drainage features of the area

### 3.3.2 Regional Description

Mpumalanga's climate is mild to sub-tropical with hot, wet summers and cold, dry winters. Mean annual precipitation ranges from less than 500mm in the eastern lowveld and 700mm in the western highveld to more than 1100mm in the escarpment.

The average summer and winter daytime temperatures (AVD) are 25°C and 20°C, respectively. The region falls within the summer rainfall region of South Africa, rainfall occurs mainly as thunderstorms (Mean Annual Precipitation 662mm) and drought conditions occur in approximately 12% of all years. Mean annual potential evaporation of 2060mm indicates a loss of water out of the system. The region experiences frequent frosts, with mean frost days of 41 days, winds are usually light to moderate with the prevailing wind direction is north-westerly during the summer and easterly during winter.

### 3.3.3 Sensitivities

The Highveld is well known for seasonal thunderstorm that can produce incidents of hail and strong winds. The storms in themselves do not pose a potential threat to the proposed power lines, however the lightning associated with these storms does have potential to disrupt power transmission.

## 3.4 Infrastructure

Access to the proposed project area is via the N12 (located to the north of Kendal powerstation) and N17 (intersecting the proposed routes) national roads. A number of secondary roads, dirt tracks and farm roads traverse the area.

## 3.5 Ecology

### 3.5.1 Flora

#### 3.5.1.1 Methodology and Data Sources

The floral data below is taken from The Vegetation of South Africa, Lesotho and Swaziland (Mucina and Rutherford 2006).

#### 3.5.1.2 Regional Description

According to the South African National Biodiversity Institute, the proposed route falls within the Grassland Biome, where most of the county's maize production occurs. Grassland vegetation units occurring in the area include Soweto Highveld Grassland, Rand Highveld Grassland, Eastern Highveld Grassland and Eastern Temperate Freshwater Wetlands (Figure 4).

The vegetation of the area surrounding Zeus Substation is classified as Soweto Highveld Grassland, extending from Mpumalanga to Gauteng and to a very small extent into Free State and North West. Soweto Highveld Grassland supports short to medium-high, dense, tufted grassland dominated almost entirely by *Themeda triandra* and accompanied by a variety of other grasses such as *Elionurus muticus*, *Eragrostis racemosa*, *Heteropogon contortus* and *Tristachya leucothrix*. Vegetation in the

vicinity of rocky outcrops is, to some extent, still intact, i.e. consisting of indigenous vegetation, but is becoming degraded due to grazing pressures. *Acacia karroo*, *Diospyros lycioides* and *Rhus pyroides* are the dominant indigenous shrubs found in low-lying areas, drainage lines and seasonal streams. In areas of rocky outcrops, shrubs such as *Diospyros lycioides*, *D. austro-africana*, *Ziziphus mucronata*, *Celtis africana* and *Rhus pyroides* are present. Clumps of exotic black wattle (*Acacia mearnsii*) and blue gums are found in the project area.

The vegetation in the area around Kendal Powerstation is classified as Eastern Highveld Grassland and includes a small area Rand Highveld Grassland. Eastern Highveld Grassland is distributed in Mpumalanga and Gauteng provinces and extends from plains between Belfast in the east and the eastern side of Johannesburg in the west and southwards to Bethal, Ermalo and west of Piet Retief. The vegetation is short dense grassland dominated by the usual highveld composition including *Aristida sp.*, *Diditaria sp.*, *Eragrostis sp.*, *Themeda sp.*, *Tristachya*. Patches of small rocky outcrops are dominated by wiry, sour grasses and some woody species (*Acacia caffra*, *Celtis africana*, *Diospyros lycioides* subsp *lycioides*, *Parinari capensis*, *Protea caffra*, *P. welwitschii* and *Rhus magalismsontanum*).

Another vegetation type associated with the region is the Eastern Temperate Freshwater Wetlands, found around water bodies and embedded within the Grassland biome. Eastern Temperate Freshwater Wetlands are typically found in flat landscapes or shallow depressions filled with (temporary) water bodies supporting zoned systems of aquatic and hydrophilous (water loving) vegetation of temporarily flooded grasslands and ephemeral herblands. Important species include *Cyperus congestus*, *Phragmites australis*, *Marsilea farinose*, *Rorippa fluviatilis*, *Disa zuluensis*, *Crassula tuberella* and the carnivorous herb *Utricularia inflexa*

### 3.5.1.3 Sensitivities

Soweto Highveld Grassland, Eastern Highveld Grassland and Eastern Temperate Freshwater Wetlands are endangered and all have a target conservation status of 24%. However, only a handful of patches of both vegetation types are conserved in statutory conservation areas and privately conserved areas. Almost half the area of Soweto Highveld Grassland and some 44% of the Eastern Highveld Grassland has been transformed by cultivation, urban sprawl, mining road infrastructure, plantations and the building of dams. The presence of Red Data floral species will be investigated during the EIA and if necessary mitigatory measures will be outlined as part of the EIA. All surface water bodies are earmarked as sensitive features and should be avoided as far as possible. The wetland demarcation will be undertaken as part of the specialist studies during the EIA phase.



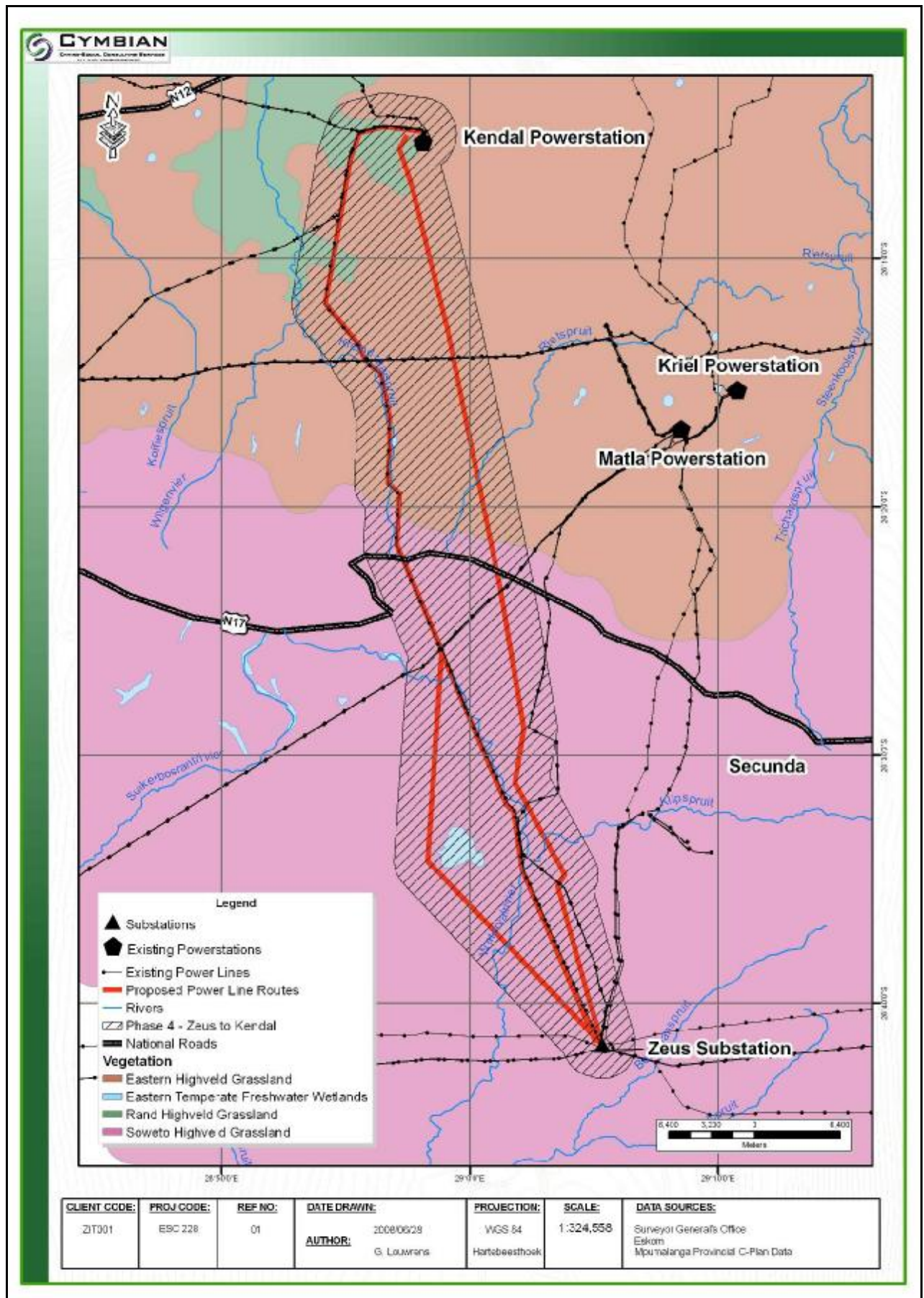


Figure 4. Vegetation of the area

---

### **3.5.2 Fauna**

#### **3.5.2.1 Methodology and Data Sources**

A literature review of the faunal species that could occur in the area was conducted. C-Plan data provided from the Mpumalanga provincial department was used to conduct a desktop study of the area. This data consists of terrestrial and aquatic components, ratings provide an indication as to the importance of the area with respect to biodiversity. A detailed avifauna study will be conducted in the summer months as part of the final report.

#### **3.5.2.2 Regional Description**

As a consequence of mining and farming in the area, it appears that only small animals are to be found at the site. Small mammals known to occur in the area include hedgehog, rabbits, polecat, meerkat and the ubiquitous rats and mice. Given the habitat, it is likely that korhaans, larks, longclaws, species of *Euplectes* (bishops and widows), weavers, starlings and sparrows occur in the grassveld.

The area surrounding the proposed powerline does include areas of irreplaceable and highly significant terrestrial and aquatic habitats (Figure 5 and Figure 6 below). As can be seen from Figure 6 the proposed route includes a large section of Wetland earmarked as irreplaceable and should be avoided all together. These areas will be treated as sensitive and will therefore be managed accordingly, if feasible they should be avoided.

Details of said management procedure will be outlined as part of the EIA and contained in the EMP.

#### **3.5.3 Sensitivities**

As mentioned above, a detailed Avi-faunal assessment will be conducted as well as a wetland delineation and assessment. Sensitive areas should be avoided and managed according to the EMP as outlined in the EIA.

### **3.6 Cultural and historical resources**

There are no known heritage resources present within the proposed project area, however the occurrence of cultural and historical resources will be investigated during the EIA phase.



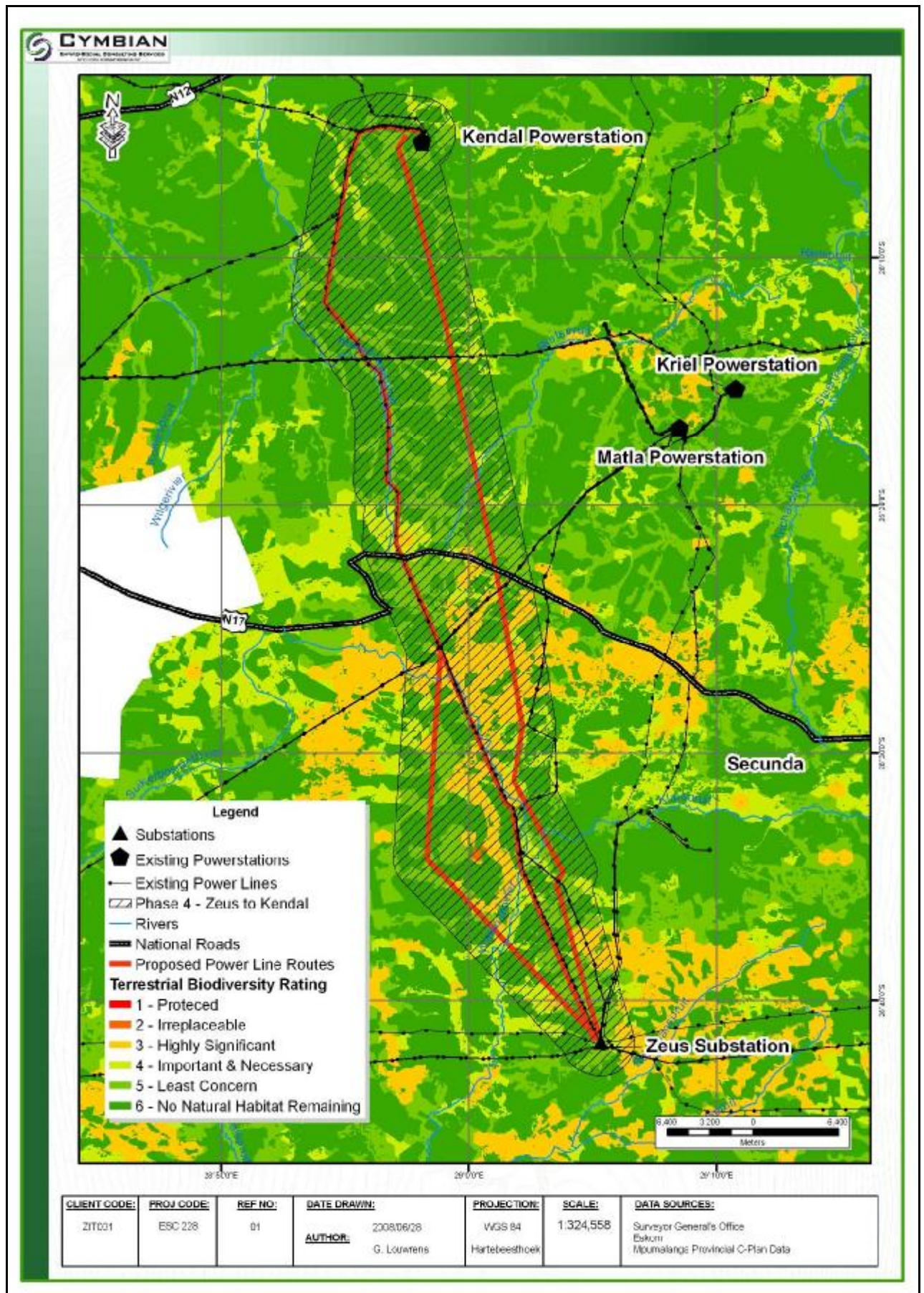


Figure 5. Sensitive fauna and flora (Terrestrial Diversity)



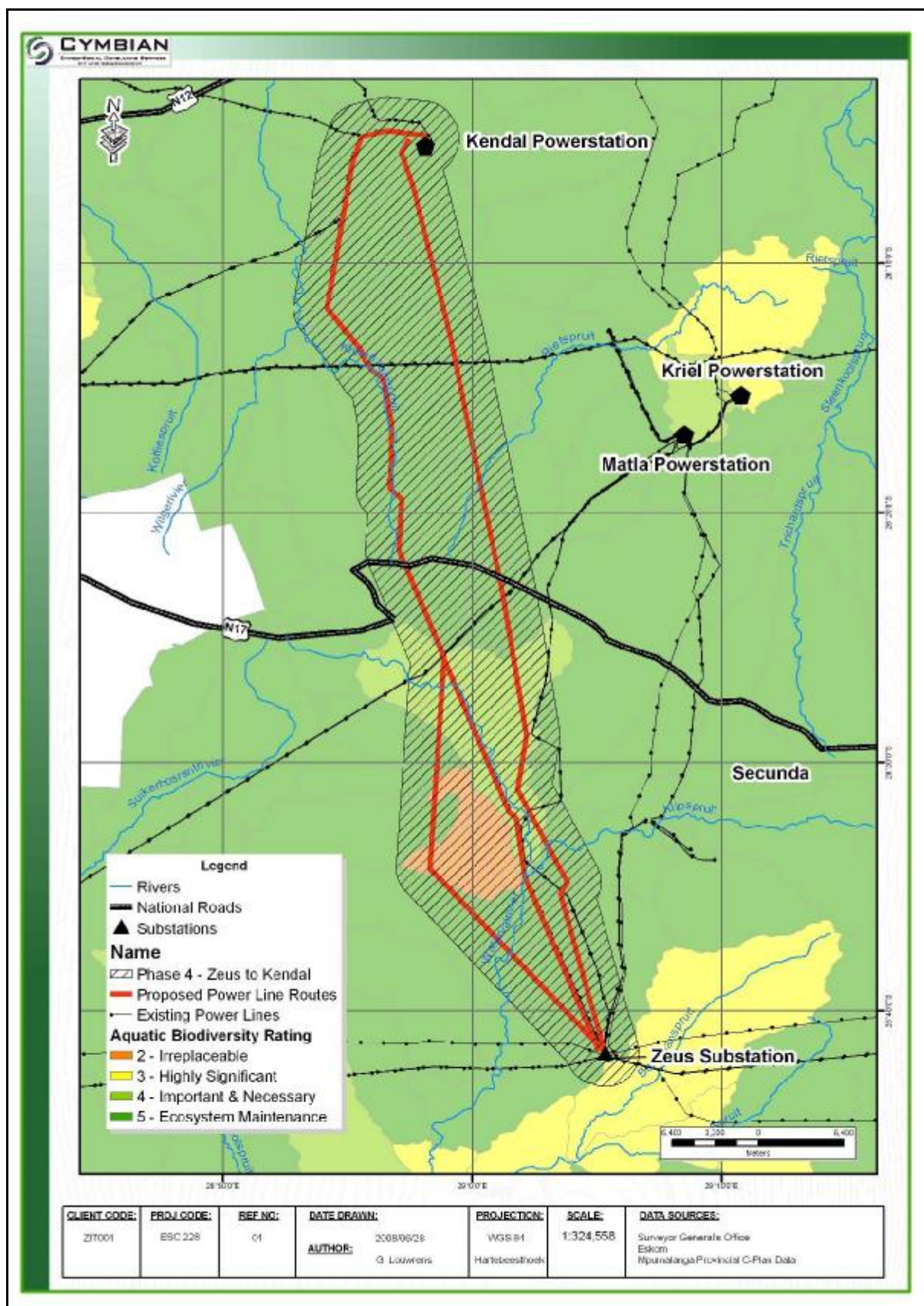


Figure 6. Sensitive fauna and flora (Aquatic Biodiversity)

---

## **4 SCOPING PROCESS**

### **4.1 Technical Process**

For the Scoping Phase of this EIA, the following technical process as detailed below has been followed:

#### **4.1.1 Pre-consultation meeting with client**

On notification and receipt of the appointment letter from Eskom, a project inception meeting held on 13 November 2007 between Eskom and Zitholele Consulting Project Team. During this project kick-off meeting the following was discussed:

- Project Scope and requirements;
- Project Schedule;
- Identification of key stakeholders and role players;
- Analyse the preliminary substation locations and power line route alignments.

#### **4.1.2 Consultation with authorities**

A pre-application consultation with Mr. Wayne Hector of DEAT was held on 21 April 2008. During this meeting the proposed project was presented to the authorising authority and the project-specific requirements for environmental authorisation were discussed and finalised.

#### **4.1.3 Application forms and landowner consent**

The EIA application form (Appendix B) for the proposed project was submitted to DEAT on 7 January 2008. The potentially affected landowners are attached as Appendix C to this report. During the Environmental Impact Assessment Phase the exact landowners will be determined.

#### **4.1.4 Site Visit**

A site visit was conducted by Mr Johan Hayes and Mr Phuti Makweya from Eskom on 22 February 2008. The objective of this site visit was to familiarise the project team with the area.

#### **4.1.5 Draft Scoping Report and Terms of Reference for Specialist Studies**

The Draft Scoping Report (DSR) was prepared on the basis of information and issues identified during the Scoping Phase of this EIA. The Terms of Reference (ToR) for the envisaged specialist studies during the Environmental Impact Assessment Phase and a Plan of Study for EIA are included in Section 6 of this report. The DSR was updated based on public review and comments obtained from the I&APs. After the public review period, this Final Scoping Report will be submitted to DEAT for approval to commence the Environmental Impact Phase.

---

## **4.2 PUBLIC PARTICIPATION PROCESS**

Public participation is an essential and legislative requirement for environmental authorisation. The principles that demand communication with society at large are best embodied in the principles of the National Environmental Management Act (Act 107 of 1998, Chapter 1), South Africa's overarching environmental law. In addition, Section 24 (5), Regulation 56 of GN R385 under the National Environmental Management Act, guides the public participation process that is required for an EIA.

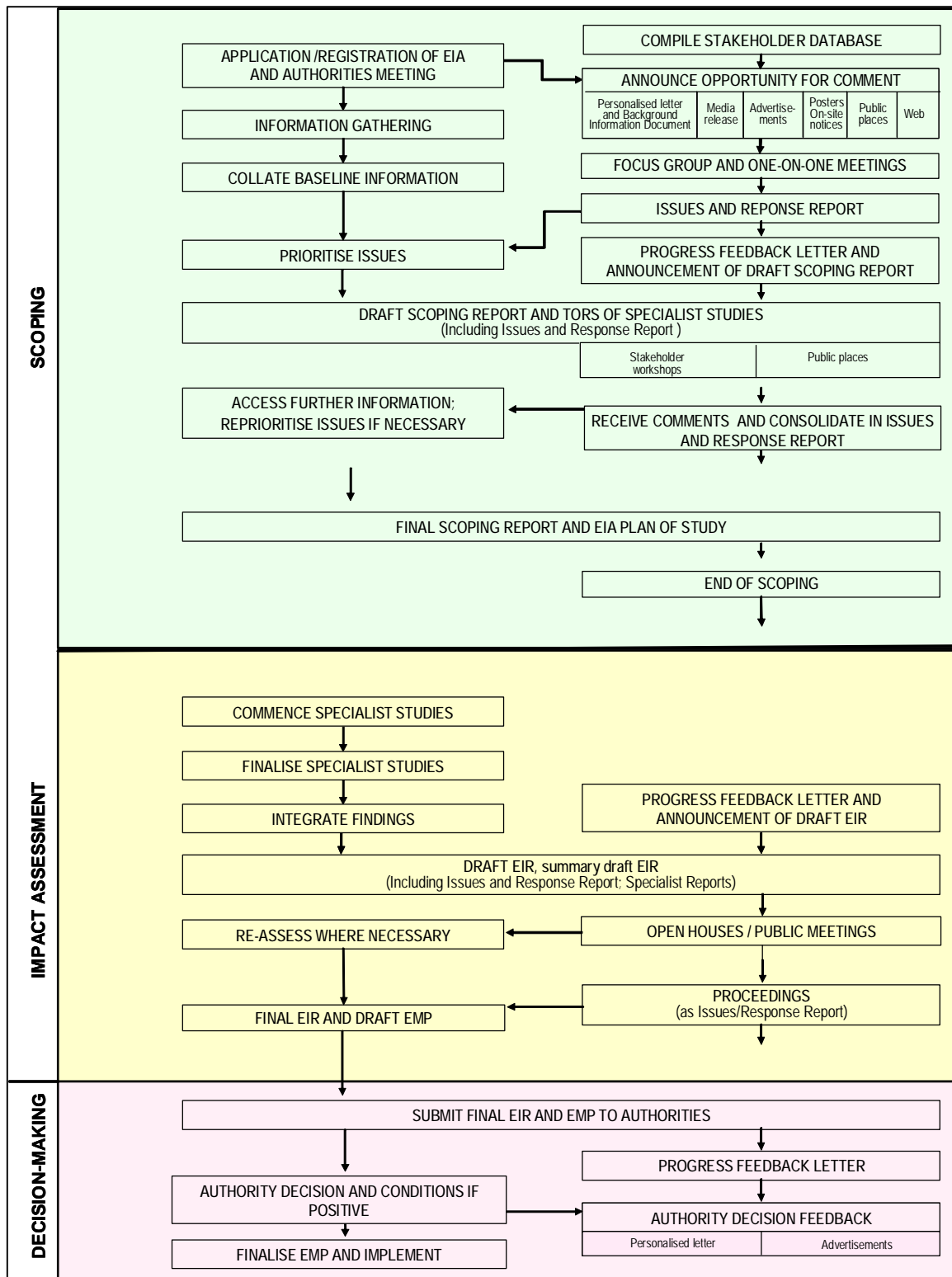
The public participation process for the proposed overhead power lines has been designed to satisfy the requirements laid down in the above legislation and guidelines. Figure 7 provides an overview of the EIA technical and public participation processes, and shows how issues and concerns raised by the public are used to inform the technical investigations of the EIA at various milestones during the process. This section of the report highlights the key elements of the public participation process to date.

### **4.2.1 Objectives of public participation in an EIA**

The objectives of public participation in an EIA are to provide sufficient and accessible information to I&APs in an objective manner to assist them to:

- During Scoping:
  - Identify issues of concern, and provide suggestions for enhanced benefits and alternatives.
  - Contribute local knowledge and experience.
  - Verify that their issues have been considered.
- During Impact Assessment:
  - Verify that their issues have been considered either by the EIA Specialist Studies, or elsewhere.
  - Comment on the findings of the EIA, including the measures that have been proposed to enhance positive impacts and reduce or avoid negative ones.

The key objective of public participation during Scoping is to help define the scope of the technical studies to be undertaken during the Impact Assessment.



**Figure 7. Technical and public participation process and activities that comprise the Environmental Impact Assessment for the proposed new 400kV power lines from Kendal Power Station to Zeus Substation.**

## 4.2.2 Identification of interested and affected parties

The identification of stakeholders is an ongoing process, refined throughout the process as on-the-ground understanding of affected stakeholders improves through interaction with various stakeholders in the area. The identification of key stakeholders and community representatives (land owners and occupiers) for this project is important and was done in collaboration with the local municipalities and other organisations in the study area.

Stakeholders' details are captured on Maximiser 9, an electronic database management software programme that automatically categorises every mailing to stakeholders, thus providing an ongoing record of communications - an important requirement by the authorities for public participation. In addition, comments and contributions received from stakeholders are recorded, linking each comment to the name of the person who made it.

According to the new EIA Regulations under Section 24(5) of NEMA, a register of I&APs must be kept by the public participation practitioner. Such a register has been compiled and is being kept updated with the details of involved I&APs throughout the process (See Appendix F).

## 4.2.3 Announcement of opportunity to become involved

The opportunity to participate in the EIA was announced in April 2008 as follows:

- Distribution of a letter of invitation to become involved, addressed to individuals and organisations by name, accompanied by a Background Information Document containing details of the proposed project, including maps of the project area and the alternative routes, and a registration sheet (Appendix F);
- Advertisements were placed in the following newspapers (Appendix D):

**Table 2: Advertisements placed during the announcement phase.**

NEWSPAPER	DATE
City Press	27 April
Pretoria News	22 April
Beeld	23 April
The Star	24 April
Citizen	25 April
Pretoria Record Central	25 April
Tshwane Sun West	30 April
Tembisan	25 April
Middelburg Herald	25 April
Witbank News	25 April
Springs Advertiser	23 April
Streeknuus	23 April
Ekasi News	25 April
Ridge Times	25 April
The Echo	25 April



- Notice boards were placed at prominent localities at each alternative site during May and June 2008 at conspicuous places at various public places and on route (Appendix D). Site notices were placed prominently to invite stakeholder participation.

#### 4.2.4 Obtaining comment and contributions

The following opportunities were available during Scoping for I&APs to contribute comment:

- Completing and returning registration/comment sheets on which space was provided for comment.
- Providing comment telephonically or by email to the public participation office.
- Attending stakeholder meetings that were widely advertised (see table below) and raise comments there.

I&APs raised both environmental technical issues and public participation issues during the Scoping period. Issues relevant to the current project configuration will be carried forward into the Impact Assessment phase.

**Table 3: List of stakeholder meetings that were advertised as part of the public review period of the Draft Scoping Report.**

DATE	VENUE
Monday, 28 July 2008 at 18:00	Midrand
Tuesday, 29 July 2008 at 18:00	Bronkhorstspuit
Wednesday, 30 July 2008 at 18:00	Kendal
Thursday, 31 July 2008 at 18:00	Leandra

#### 4.2.5 Issues and Response Report and acknowledgements

Issues raised thus far, are captured in an Issues and Response Report Version 2, appended to this FSR (Appendix G). This report will be updated to include any additional I&AP contributions that may be received as the EIA process proceeds, and as the findings of the EIA become available. Issues and comments raised during the public review period of the Draft Scoping Report will be considered in the Final Scoping Report and added to the report as Version 2 of the Issues and Response Report.

The contributions made by I&APs are acknowledged in writing.

#### 4.2.6 Draft Scoping Report

The purpose of the DSR was to enable I&APs to verify that their contributions have been captured, understood and correctly interpreted, and to raise further issues. At the end of Scoping, the issues identified by the I&APs and by the environmental technical specialists, were used to define the Terms of Reference for the Specialist Studies that will be conducted during the Impact Assessment Phase of

the EIA. A period of four weeks is available for public review of this report (from Monday 21 July to Thursday, 21 August 2008).

In addition to media advertisements and site notices to announce the opportunity to participate in the EIA, the opportunity for public review was announced as follows:

- In the Background Information Document (April 2008).
- In advertisements published (see table above and Appendix D) to advertise the public review period
- In a letter sent out on 7 July 2008, and addressed personally to all individuals and organisations on the stakeholder database.

The Draft Scoping Report, including the Issues and Response Report Version 1, was distributed for comment as follows:

- Left in public places in the project area. The public places where documents are available is listed in the table below:
- Mailed to key stakeholders.
- Mailed to I&APs who requested the report.

I&APs can comment on the report in various ways, such as completing the comment sheet accompanying the report, and submitting individual comments in writing or by email.

**Table 4. List of public places where the Draft Scoping Report is available**

PLACE	CONTACT PERSON	TELEPHONE
Blue Valley Golf and Country Estate, HALFWAY HOUSE	Bothma, Lise	(011) 512 0538
City of Johannesburg: Human Development, HALFWAY HOUSE	Kubheka, Kaiser	(011) 203 3419
Delmas Public Library, DELMAS	Mehlape, Lydia	(013) 665 2425
Kungwini Public Library, BRONKHORSTSPRUIT	Smith, Brenda	(013) 665 2425
Leandra Public Library, LEANDRA	Potgieter, A M	(017) 683 0055
Lebogang Public Library, LESLIE	Mosako, Rosina	(017) 683 3000
Midfield Homeowners Association, MIDSTREAM ESTATES	Du Preez, Tarynlee	(012) 661 0456
Midlands Homeowners Association, MIDSTREAM ESTATES	De Wet, Lizette	087 805 3610
Midstream Homeowners Association, MIDSTREAM ESTATES	van der Westhuizen, Durette	(012) 661 0915
Olievenhoutbosch Library, OLIVENHOUTBOSCH	Nkonki, Bongsi	(012) 652 1001
Phola Public Library, OGIES	Mabena, Agnes	(013) 645 0094
Secunda Public Library, SECUNDA	Griesel, Tertia	(017) 620 6183

#### **4.2.7 Final Scoping Report**

The Final Scoping was updated with additional issues raised by I&APs and contains any new information that may have been generated as a result of this process. The FSR was distributed to the Authorities (DEAT) and key I&APs, and to those individuals who specifically request a copy. I&APs were notified of the availability of the report.

Once the lead authority for the EIA has approved the Final Scoping Report, the Impact Assessment Phase of the EIA will commence. This will comprise various Specialist Studies to assess the potential positive and negative impacts of the proposed project, and to recommend appropriate measures to enhance positive impacts and avoid or reduce negative ones. I&APs will be kept informed of progress with these studies.

#### **4.2.8 Public participation during the Impact Assessment**

Public participation during the impact assessment phase of the EIA will mainly involve a review of the findings of the EIA, presented in the Draft Environmental Impact Report, a Summary Report of the Draft EIR, and the volume of Specialist Studies.

I&APs will be advised in good time of the availability of these reports, how to obtain them, and the dates and venues of public and other meetings where the contents of the reports will be presented for comment.

## 5 ENVIRONMENTAL IMPACT ASSESSMENT

The proposed overhead power lines are anticipated to impact on a range of biophysical and socio-economic aspects of the environment. One of the main purposes of the EIA process is to understand the significance of these potential impacts and to determine if they can be minimized or mitigated.

Based on the duration of construction, negative impacts can be readily predicted and mitigated. It should be noted that a comprehensive construction phase Environmental Management Plan (EMP) would be developed and implemented to regulate and minimize the impacts during the construction phase. The potential environmental impacts identified during the Scoping Phase are discussed in the sections below.

**Table 5: Potential Environmental Impacts to be investigated in the EIA phase.**

Environmental Element	Potential Environmental Impact
Topography and Land Use	<p><b>Visual Environment</b></p> <p>1.) Construction of the power line may alter the visual environment.</p>
Geology, Soil and Land Capability, and Drainage Features	<p><b>Geotechnical</b></p> <p>1.) Due to the lack of dolomite or sensitive geology, no impact is expected on the geological receiving environment.</p> <p>2.) Geotechnical stability does not seem to be an issue of concern for proposed power line towers.</p> <p><b>Drainage Features</b></p> <p>1.) Insufficient rehabilitation post construction may result in erosion of the landscape. Eroded materials may enter the surface water environment contributing to sedimentation of the local surface water resources.</p> <p><b>Soil and Land Capability</b></p> <p>1.) Insufficient control measures during the construction phase may result in erosion, compaction, and sterilisation of soil resources.</p> <p>2.) A consequence of impacts to the soil resource is a reduction in land capability.</p> <p>3.) Poor soil amelioration measures during the rehabilitation phase may result in a lack of vegetation establishment. Thus contributing to the failure of rehabilitation measures.</p>
Climate	<p>Local climate conditions do not appear to be of a significant concern to the project. The project will further not contribute to local or global climate change.</p>
Infrastructure	<p><b>Power Lines</b></p> <p>1.) Unsuitably located power lines may impact on the existing power lines that converge towards the Zeus substation.</p> <p><b>Substation</b></p> <p>1.) The proposed power lines will not negatively impact on the existing Zeus substation, as this has been taken into account during project planning.</p> <p><b>Roads</b></p> <p>1.) Existing roads may be negatively impacted during the</p>

	<p>construction phase. Cognisance must be taken of existing roads, and potential temporary road deviations.</p> <p><b>Construction Camp</b></p> <ol style="list-style-type: none"> <li>1.) The construction camp, although temporary, may negatively impact several environmental elements as a result of: <ol style="list-style-type: none"> <li>a. Hydro-carbon storage and handling on site;</li> <li>b. Handling, storage, and management of dangerous / hazardous goods on site i.e. welding, paints, cleaning solvents etc; and</li> <li>c. Vegetation clearing and site establishment; and</li> <li>d. Vehicle maintenance;</li> <li>e. Transportation and handling of construction materials; and</li> <li>f. Cement batching.</li> </ol> </li> </ol>
Flora	<p><b>Vegetation Clearing</b></p> <ol style="list-style-type: none"> <li>1.) Vegetation clearing at the construction camp, at tower positions, along access roads, and under existing and future overhead lines will result in negative impacts to the flora on site.</li> </ol> <p><b>Alien Invasive Species</b></p> <ol style="list-style-type: none"> <li>1.) Disturbed areas will be prone to Alien Invasive species infestation.</li> </ol>
Fauna	<p>The impacts to vegetation will negatively impact on habitat, and consequently the faunal elements of the receiving environment.</p>
Cultural and Historical Resources	<p>Based on currently available information no impacts are expected to the cultural and historical environment.</p>
Socio-Economic Environment	<p><b>Traffic</b></p> <ol style="list-style-type: none"> <li>1.) During the construction phase increased heavy vehicle traffic should be expected. Without management, such increased traffic loads may negatively impact existing traffic flow.</li> <li>2.) Unmanaged construction vehicles may decrease road safety to other road users.</li> <li>3.) Uncontrolled movement of construction vehicles may result in unnecessary impacts to the environment through vegetation and habitat destruction.</li> </ol> <p><b>Noise</b></p> <ol style="list-style-type: none"> <li>1.) Uncontrolled construction activities may negatively impact on the ambient noise levels in the area.</li> </ol> <p><b>Employment and Community Related Impacts</b></p> <ol style="list-style-type: none"> <li>1.) The news of employment opportunities may result in an influx of workers to the area, thereby impacting existing community networks and perceptions of safety and crime levels.</li> <li>2.) Unmanaged workers may result in illegal township establishment and increased numbers of informal settlements. Such settlements often negatively impact a range of environmental elements.</li> </ol> <p><b>Consultation</b></p> <ol style="list-style-type: none"> <li>1.) Unmanaged and insufficient consultation with communities and land owners often generates negative sentiment towards developments that persist beyond the construction phase of a</li> </ol>

---

	<p>project.</p> <p>2.) Insufficient consultation may result in unnecessary impacts to local inhabitants and land owners.</p>
--	--

---

## **6 PLAN OF STUDY FOR EIA**

### **6.1 Technical Process**

#### **6.1.1 Prepare Specialist Investigations**

The specialist investigations to be conducted during the EIA-phase of this project will consist of the following studies:

- Historical and Archaeological Assessment;
- Soils and Land Capability Assessment;
- Ecology (Fauna and Flora) and Avi-fauna Assessment; and
- GIS and Visual Assessment.

The findings of these studies will be reflected in the Environmental Impact Assessment Report. The proposed Terms of Reference (ToR) for each of these specialist investigations is indicated below.

#### **6.1.2 Specialist Studies: Terms of Reference (ToR)**

##### ToR: Soils and Land Capability

A Soil and Land Capability investigation will be conducted for Bravo 4: Construction of two new 400kV power lines from Kendal power station to Zeus Substation. The objectives of this study will be:

- Review existing geological information available;
- An aerial photographic study to assess the accessibility, vegetation cover, drainage lines, slope aspects and percentage outcrop of each of the three routes.
- A field visit to verify the aerial photographic study observations. Additionally, during the visit, the depth and engineering properties of regolith will be judged from natural exposure (dongas) and hand augering (in case of sandy soils) where applicable. The rock types of outcrop will be identified and the engineering properties thereof assessed.
- A map will be compiled of each of the alternative terrains, indicating the features observed.
- A short report will be compiled, in which the alternatives will be prioritised based on the results of the study.

---

### ToR: Ecology and Avi-fauna

An Ecological and avi-fauna investigation would be conducted on the alternative power lines routes for the proposed project. The objectives of this study will be:

- Review existing ecological information available;
- Conduct a site visit to determine the general ecological state of the proposed site, determine the occurrence of any red data and vulnerable species;
- Provide mitigation measures to prevent and/or mitigate any environmental impacts that may occur due to the proposed project;
- Provide a ranking assessment of the suitability of the three proposed alternative routes;
- Compile an ecological report, indicating findings, recommendations and maps indicating sensitive and/or no-go areas.

### ToR: Historical and Archaeological

This Heritage Impact Assessment would be conducted to comply with Section 38 of the National heritage Resources Act (No 25 of 1999). Specific objectives of this study will be:

- Desktop study (consulting heritage data banks and appropriate literature);
- Site visit of the project area;
- Determine whether any of the types and ranges of heritage resources as outlined in Section 3 of the Act (No 25 of 1999) do occur in the project area;
- Determine what the nature, the extent and the significance of these remains are;
- Determine whether any heritage resources (including graves) will be affected by the development project; and
- If any heritage resources are to be affected by the development project mitigation measures (Phase II studies) has to be undertaken and management proposals have to be set for heritage resources which may continue to exist unaffected in or near the project area.

### ToR: GIS and Visual Assessment

This GIS and Visual Assessment would be conducted on the alternative routes for the proposed overhead power lines. Specific objectives of this study will be:

- Desktop study (consulting existing and appropriate literature);
- Site visit of the project area if required;
- Assess the visual impact of the proposed development on each of the three alternative routes;



- Suggest any recommendation / mitigation measures that can be done to decrease the impacts of the proposed development;
- Provide a ranking assessment of the suitability of the three proposed alternative routes;
- Compile a visual assessment report, indicating findings, fatal flaws, recommendations and maps indicating sensitive and/or no-go areas.

### 6.1.3 Impact Analysis

The significance (quantification) of potential environmental impacts identified during scoping and identified during the specialist investigations will be determined using a ranking scale, based on the following:

- **Occurrence**
  - Probability of occurrence (how likely is it that the impact may occur?), and
  - Duration of occurrence (how long may it last?)
- **Severity**
  - Magnitude (severity) of impact (will the impact be of high, moderate or low severity?), and
  - Scale/extent of impact (will the impact affect the national, regional or local environment, or only that of the site?)

Each of these factors has been assessed for each potential impact using the following ranking scales:

<p><b>Probability:</b>            5 – Definite/don't know            4 – Highly probable            3 – Medium probability            2 – Low probability            1 – Improbable            0 – None</p>	<p><b>Duration:</b>            5 – Permanent            4 - Long-term (ceases with the operational life)            3 - Medium-term (5-15 years)            2 - Short-term (0-5 years)            1 – Immediate</p>
<p><b>Scale:</b>            5 – International            4 – National            3 – Regional            2 – Local            1 – Site only            0 – None</p>	<p><b>Magnitude:</b>            10 - Very high/don't know            8 – High            6 – Moderate            4 – Low            2 – Minor</p>

The environmental significance of each potential impact was assessed using the following formula:

$$\text{Significance Points (SP)} = (\text{Magnitude} + \text{Duration} + \text{Scale}) \times \text{Probability}$$

The maximum value is 100 Significance Points (SP). Potential environmental impacts were rated as high, moderate or low significance on the following basis:

- 
- More than 60 significance points indicates high environmental significance.
  - Between 30 and 60 significance points indicates moderate environmental significance.
  - Less than 30 significance points indicates low environmental significance.

#### **6.1.4 Draft EIA Report and EMP**

Findings and/or recommendations of the specialist studies will be integrated into a report that will be updated as comments are received from I&APs. The Final EIA report together with a draft construction and operation EMP will be submitted to DEAT for environmental authorisation.

### **6.2 Public Participation**

The public participation process for the EIA will involve the following proposed steps:

- Announcement of the availability and public review of the draft Environmental Impact Report;
- Announcement of the availability of the final Environmental Impact Report; and
- Notification of the authorities' decision with regard to Environmental Authorisation.

Information about each step is provided below.

#### **6.2.1 Announcing the availability of the Draft EIR and EMP**

At this point, specialist assessments would have been conducted and the Draft EIR and EMP would be ready for public review. A letter will be circulated to all registered I&APs, informing them of progress made with the study and that the Draft EIR and EMP are available for comment. The report will be distributed to public places and also presented at a stakeholder workshop / open house.

#### **6.2.2 Public review of Draft EIR and EMP**

The EIA Guidelines specify that stakeholders must have the opportunity to verify that their issues have been captured and assessed before the EIA Report will be approved. The findings of the specialist assessments will be integrated into the Draft EIR. The report will be written in a way accessible to stakeholders in terms of language level and general coherence. The Draft EIR will have a comprehensive project description, motivation, and description of alternatives considered and also the findings of the assessment and recommended mitigation measures. It will further include the Issues and Responses Report, which will list every issue raised, with an indication of where the issue was dealt with in the EIR. The findings of the assessment and recommended mitigation measures will also be incorporated into the EIR.

As part of the process to review the Draft EIR and EMP, stakeholder workshops with an open house component will be arranged to afford stakeholders the opportunity to obtain first-hand information from the project team members and also to discuss their issues and concerns.

Contributions at this meeting will be considered in the Final EIR. It is proposed that the same public places be used as in the scoping phase and also that stakeholder meeting be conducted at the same venues as during scoping.

### **6.2.3 Announcing the availability of the Final EIR and EMP**

After comments from I&APs have been incorporated, all stakeholders on the database will receive a personalised letter to report on where we are in the process, to thank those who commented to date and to inform them that the Final EIR and EMP have been submitted to the lead authority for consideration.

### **6.2.4 Announce authorities' decision on Environmental Authorisation**

Based on the contributions by the stakeholders, the decision of the authorities may be advertised through the following methods:

- Personalised letters to individuals and organisations on the mailing list;
- Advert in local or regional newspapers

---

## 7 CONCLUSION AND WAY FORWARD

Eskom appointed Zitholele Consulting to undertake the Environmental Impact Assessment for the proposed Bravo Phase 4: Construction of two new 400kV power lines from Kendal Power Station to Zeus Substation. This Scoping study was undertaken with the aim of investigating potential negative impacts on the biophysical environment and identifying issues, concerns and queries from I&APs. The report documents the process followed, the findings and recommendations of the Scoping study, and the proposed Plan of Study for the EIA phase to follow. The way forward recommended by this study is as follows:

- This report is to be submitted to the relevant authority for approval prior to proceeding with the EIA Phase of the project;
- Upon approval of the Scoping Report all participating stakeholders are to be notified of the conditions of the relevant authority for proceeding with the EIA;
- Amend the Plan of Study for EIA as required by conditions recommended by the relevant authority;
- Execute the Plan of Study for the EIA Phase of the project.

### **ZITHOLELE CONSULTING (PTY) LTD**

Warren Kok

Z:\PROJECTS\10637 – ESKOM BRAVO EIA\REPORTS\FSRS\BRAVO 4\10637 - FSR BRAVO 4 WK REVIEW FINAL.DOC

Anelle Odendaal

**APPENDIX A**  
**EIA Application Form**

**APPENDIX B**  
**Landowner Consent Forms**

## **APPENDIX C**

### **Newspaper Advertisements and Site Notices**

**APPENDIX D**  
**Project Location Map**



**APPENDIX E**  
**I&AP Database**

**APPENDIX F**  
**Issues and Response Report**

## **APPENDIX G**

### **Background Information Document**