

# 2018

**DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED  
DEVELOPMENT OF SIYATHEMBA 20MVA 88/22kV SUBSTATION AND  
ASSOCIATED INFRASTRUCTURE WITHIN THE JURISDICTION OF  
DIPALESENG LOCAL MUNICIPALITY IN THE MPUMALANGA PROVINCE**

**AUGUST 2018**

**Prepared By:**

Nsovo Environmental Consulting

**Cell:** 071 602 2369

**Fax:** 086 602 8821

**Tel:** 011 041 3689

**Email:** [admin@nsovo.co.za](mailto:admin@nsovo.co.za)

**Date of Submission:** August 2018



"From the world we live to the world we seek"

## EXECUTIVE SUMMARY

Nsovo Environmental Consulting (hereafter referred to as Nsovo) was appointed by F&A consulting and Calibre to undertake an Environmental Impact Assessment (EIA) for the proposed development of Siyathemba 20MVA 88/22kV substation and associated infrastructure located within the jurisdiction of the Dipaleseng Local Municipality (Ward 3) in Mpumalanga Province.

In terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (herein referred to as NEMA), as read with the amended EIA Regulations of GN R983, GN R984 and R985, a Basic Assessment process should be undertaken and an Environmental Authorisation (EA) must be obtained from the National Department of Environmental Affairs (DEA) prior commencement of any of the listed activities. .

The description of associated listed activities which triggers the amended EIA process is listed in **Table 1** and this includes *Activity 11* of GN R983: “*The development of facilities or infrastructure for the transmission and distribution of electricity outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts*”.

This Basic Assessment Report (BAR) contains the following:

- The details and expertise of the Environmental Assessment Practitioner (EAP) who prepared the report;
- The location of the proposed activities;
- A plan which locates the proposed activities to be undertaken;
- Description of the scope of the proposed project including the listed activities and the associated structures and infrastructures;
- Description of Policy and Legislative content within which the development is located and an explanation of how the development complies with and responds to the legislation and policy context;
- A motivation for the need and desirability of the proposed development;
- A full description of the process followed to reach the proposed preferred activities, site and proposed location of the development footprint within the site;
- A plan of study for undertaking the environmental impact assessment process to be undertaken; and

- An undertaking under oath or affirmation by the EAP

Two substations alternatives were identified and assessed namely; substation options 1 and 2. Alternative with the least environmental impacts will be considered based on the findings and recommendations by the specialists and the assessment of the impacts by the EAP as well as the input from the public. Detailed information of all the alternatives considered including site and no-go alternatives are discussed in section 7.1.





*"From the world we live to the world we seek "*

## DOCUMENT CONTROL

### PROJECT TITLE:

Draft Basic Assessment Report for the proposed development of Siyathemba 20MVA 88/22kV substation and associated infrastructure within the jurisdiction of Dipaleseng Local Municipality in the Mpumalanga Province

### QUALITY CONTROL:

Report:	Compiled By:	Peer Reviewed By:
Draft Basic Assessment Report	Masala Mahumela 	Munyadziwa Rikhotso 

## TABLE OF CONTENT

CONTENT	PAGE
<b>1. INTRODUCTION OF THE PROPOSED PROJECT.....</b>	<b>13</b>
<b>2. DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) .....</b>	<b>13</b>
<b>3. DESCRIPTION OF LOCALITY AND THE PROPERTY ON WHICH THE ACTIVITY IS TO BE UNDERTAKEN AND LOCATION OF ACTIVITY ON THE PROPERTY .....</b>	<b>15</b>
3.1 LOCALITY OF THE PROPOSED PROJECT.....	15
3.1.1 Province.....	15
3.1.2 Municipal Ward.....	15
3.1.3 Affected Farm.....	15
3.1.4 Locality Map.....	16
3.2 SURROUNDING LAND USES.....	18
3.2.1 Residential.....	18
3.2.2 Commercial and Industrial.....	19
3.2.3 Agriculture.....	19
3.3 SURFACE INFRASTRUCTURE.....	19
3.3.1 Road Network.....	19
3.3.2 Existing electricity infrastructure.....	20
3.3.3 Gas Pipeline.....	21
3.3.4 Railway line.....	21
<b>4. DESCRIPTION OF THE SCOPE PROPOSED ACTIVITIES.....</b>	<b>22</b>
4.1 THE PROPOSED SCOPE OF WORK.....	22
4.2 ACTIVITIES ASSOCIATED WITH THE PROJECT.....	23
4.2.1 Access roads.....	23
4.2.2 Vegetation clearance.....	23
4.2.3 Construction of the substation.....	23
4.2.4 Steelworks structures.....	24
4.2.5 Completion of construction work.....	24
4.3 LISTED ACTIVITY APPLICABLE TO THE PROJECT.....	24

<b>5.</b>	<b>APPLICABLE LEGISLATION AND GUIDELINES.....</b>	<b>26</b>
<b>6.</b>	<b>DESCRIPTION OF THE NEED AND DESIRABILITY OF THE PROPOSED ACTIVITY .....</b>	<b>31</b>
6.1	MOTIVATION FOR THE DEVELOPMENT .....	31
6.2	BENEFITS OF THE PROJECT .....	31
6.2.1	Supporting Strategies .....	32
<b>7.</b>	<b>DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ACTIVITY, SITE AND LOCATION WITHIN THE SITE .....</b>	<b>32</b>
7.1	DETAILS OF ALTERNATIVES CONSIDERED.....	32
7.1.1	Substation Alternatives .....	32
7.2	PUBLIC PARTICIPATION PROCESS .....	36
7.2.1	PUBLIC PARTICIPATION PRINCIPLES .....	37
7.2.2	APPROACH AND METHODOLOGY .....	38
7.2.3	Identification of interested and affected parties.....	38
7.2.4	Public participation process.....	38
7.2.5	Site notices.....	39
7.2.6	Distribution of notices to surrounding land owners / occupiers .....	39
7.2.7	Placement of advertisement in the local newspaper.....	39
7.2.8	Placement of draft basic assessment report for comments .....	39
7.2.9	Public Meetings .....	40
7.3	A SUMMARY OF ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES.....	40
<b>8.</b>	<b>DESCRIPTION OF THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES FOCUSING ON THE GEOGRAPHICAL, PHYSICAL, BIOLOGICAL, SOCIAL, HERITAGE AND CULTURAL ASPECTS.....</b>	<b>40</b>
8.1.1	Socio-economic description.....	40
8.2	DIPALESENG LOCAL MUNICIPALITY .....	43
8.2.1	Geology within the study area .....	44
8.2.2	Topography of the study area .....	45
8.2.3	Surface Water within the area .....	45
8.2.4	Air quality and pollution.....	46
8.2.5	Vegetation structure and composition.....	47
8.2.6	Presence of sensitivity areas .....	48
8.2.7	Heritage And Archaeological aspects .....	50

---

<b>9. DESCRIPTION OF THE ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS INCLUDING CUMULATIVE IMPACTS IDENTIFIED.....</b>	<b>50</b>
9.1 POTENTIAL ENVIRONMENTAL IMPACTS IDENTIFIED.....	51
9.2 ASSESSMENT OF THE IMPACTS PER SITE .....	57
9.3 GENERAL CUMULATIVE IMPACTS .....	67
9.4 METHODOLOGY FOR ASSESSING SIGNIFICANCE OF POTENTIAL IMPACTS .....	71
<b>10. AN UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP .....</b>	<b>72</b>
<b>11. ENVIRONMENTAL IMPACT STATEMENT .....</b>	<b>73</b>
<b>12. SUMMARY OF IMPACT MANAGEMENT MEASURES IDENTIFIED FROM SPECIALISTS REPORTS .....</b>	<b>73</b>
<b>13. CONCLUSION AND RECOMMENDATIONS .....</b>	<b>76</b>
<b>14. REFERENCES .....</b>	<b>77</b>



## LIST OF TABLES

Table	Page
Table 1: Details of the EAP .....	14
Table 2: The affected farm name, portion number and 21 Surveyor General Code .....	16
Table 3: Main economic sectors of Gert Sibande District Municipality (Integrated Development Plan (IDP), 2017)...	19
Table 4: Listed Activity triggering EIA applicable to the proposed project .....	24
Table 5: Legislation pertaining to the proposed project .....	26
Table 6: Corner points of the proposed substations .....	33
Table 7: Comparison of the proposed substation options .....	34
Table 8: Selection of preferred Alternatives from specialist findings.....	35
Table 9 : Potential environmental impact identified .....	51
Table 10: Methodology used in determining the significance of potential environmental impacts.....	71
Table 11: Summary of the impact management measures from specialist .....	74

## LIST OF FIGURES

Figure	Page
Figure 1: Locality map of the project indicating the proposed two substation options.....	17
Figure 2: The view of residential settlements from the proposed site (Site visit, 2018).....	18
Figure 3: The existing power lines within the proposed site (Site visit, 2018).....	20
Figure 4: The existing gas pipeline within the study area (Site visit, 2018) .....	21
Figure 5: The view of railway line which runs along the proposed site (Site visit, 2018) .....	22
Figure 6: Corner points of the proposed substations .....	33
Figure 7: Comparison of the proposed substation options .....	34
Figure 8: Map of South Africa and its provinces (Source: <a href="http://www.odm.org.za">www.odm.org.za</a> ).....	42
Figure 9: The Districts of Mpumalanga Province ( <a href="http://www.municipalities.co.za">www.municipalities.co.za</a> ).....	43
Figure 10: Map showing the Dipaleseng Local Municipality and major towns ( <a href="http://www.municipalities.co.za">www.municipalities.co.za</a> ).....	44
Figure 11: Geological map of the study area.....	45
Figure 12: Hydrological map of the proposed location.....	46
Figure 13: Sensitivity map of the proposed site .....	49

## LIST OF APPENDICES

Appendix A:	Maps
Appendix B:	Site Photographs
Appendix C:	Specialist Reports
Appendix C1:	Draft Biodiversity Specialist Report
Appendix C2:	Draft Heritage Specialist Report
Appendix C3:	Draft Wetland Impact Assessment Report
Appendix D:	Public Participation Process
Appendix D1:	Site Notices
Appendix D2:	Newspaper Advert
Appendix D3:	Notification Letters and Proof of Registered Mail
Appendix D4:	Issues and Response Report
Appendix D5:	I&AP Database and Registered Interested & Affected Parties
Appendix D6:	Background Information Document
Appendix E	Details of EAP and Declaration
Appendix F:	Environmental Management Programme
Appendix G:	Declaration of Specialists

## LIST OF ACRONYMS AND ABBREVIATIONS

<b>BAR</b>	Basic Assessment Report
<b>CBA</b>	Critical Biodiversity Area
<b>DEA</b>	Department of Environmental Affairs
<b>DWS</b>	Department of Water and Sanitation
<b>MEDET</b>	Mpumalanga Department of Economic Development, Environment and Tourism
<b>EA</b>	Environmental Authorisation
<b>EIA</b>	Environmental Impact Assessment
<b>EMPr</b>	Environmental Management Programme
<b>EAP</b>	Environmental Assessment Practitioner
<b>HV</b>	High Voltage
<b>HIA</b>	Heritage Impact Assessment
<b>I&amp;APs</b>	Interested and Affected Parties
<b>Km</b>	Kilometres
<b>kV</b>	Kilovolts
<b>Mm</b>	Millimetre
<b>NEMA</b>	National Environmental Management Act
<b>NMD</b>	Noted Maximum Demand
<b>SAHRA</b>	South African Heritage Resources Agency
<b>SOC</b>	State Owned Company
<b>SABS</b>	South African Bureau of Standards
<b>SANBI</b>	South African National Biodiversity Institute
<b>Tx</b>	Transmission
<b>WULA</b>	Water Use Licence Application

## 1. INTRODUCTION OF THE PROPOSED PROJECT

Nsovo Environmental Consulting has been appointed by F&A consulting and Calibre (hereafter referred to as Calibre) to undertake the Basic Assessment (BA) process in terms of the National Environmental Management Act, 1998 Act No. 107 of 1998) (NEMA) and the Environmental Impact Assessment (EIA) Regulations of December 2014 as amended and other applicable Acts for the proposed development of Siyathemba 20MVA/88kV substation and associated infrastructure within the jurisdiction of Dipaleseng Local Municipality in the Mpumalanga Province.

Eskom is supplying Dipaleseng Local Municipality (via Balfour Town Substation) with a Noted Maximum Demand (NMD) of 7.5MVA. The Balfour Town substation consists of 2 x 5MVA 88kV/6.6kV transformers and its peak demand was recently recorded to be 7.2 MVA. Further, Eskom also distributes (at 22kV) to rural settlements in the vicinity of Balfour substation through a 1 x 5MVA 88/22kV transformer which is insufficient to accommodate future residential of Balfour Siyathemba area.

The current electricity network does not have spare capacity to accommodate future residential developments and potential industries around Siyathemba. Consequently, the Dipaleseng Local Municipality has proposed to develop the Siyathemba 20MVA 88/22kV substation and associated infrastructure in order to increase power supply in the area. The proposed development will directly and indirectly improve the standard of living for Siyathemba communities as it will create employment opportunities, generate income and contribute to local economy as well as the country as a whole

The proponent for the proposed development is Dipaleseng Local Municipality whereas the Competent Authority (CA) is the National Department of Environmental Affairs (DEA). The proposed project will be undertaken in terms of the National Environmental Management Act, 1998 (NEMA 107 of 1998) and the EIA Regulation of December 2014 (as amended in April 2017), other applicable Acts and Legislation will be equally considered

## 2. DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Nsovo has been appointed as the independent Environmental Assessment Practitioner (EAP) for the proposed project and meets the general requirements as stipulated in regulations 13 (3) of the NEMA EIA 2014 Regulation as amended. Nsovo therefore is:

- Independent and objective;
- Has expertise in conducting EIA's;
- Takes into account all relevant factors relating to the application; and
- Provides full disclosure to the applicant and the relevant environmental authority.

**Table 1** below provides the details of the EAP and relevant experience. A detailed CV and qualifications of the EAP is attached as **Appendix E1**.

**Table 1: Details of the EAP**

<b>Name of Company</b>	Nsovo Environmental Consulting
<b>Person Responsible</b>	Masala Mahumela
<b>Professional Registration</b>	South African Council for Natural Scientific Professions (SACNASP)
<b>Postal Address</b>	P/Bag x29 Post net Suite 697 Gallo Manor 2052
<b>Telephone Number</b>	011 041 3689
<b>Fax Number</b>	086 602 8821
<b>Email</b>	<a href="mailto:Masala.mahumela@nsovo.co.za">Masala.mahumela@nsovo.co.za</a>
<b>Qualifications &amp; Experience</b>	B.Sc. Honours Environmental Management <b>10 years of experience</b>
<b>Project Related Expertise</b>	In terms of project related expertise, the EAP has completed the following projects: <ul style="list-style-type: none"> <li>• EIA for the proposed Shongweni substation and Hector - Shongweni 400kV powerline in KwaZulul Natal Province.</li> <li>• EIA for the proposed Inyaninga substation and Inyaninga – Mbewu 400kV powerline in KwaZulul Natal Province.</li> <li>• EIA for the proposed Tubas strengthening Phase 1 – Senakangwedi B integration within</li> </ul>

	<p>the jurisdiction of Greater Tubatse Local Municipality in Limpopo Province.</p> <ul style="list-style-type: none"> <li>• EMPr, WULA and EA amendment for the proposed Juno - Gromis 400kV power line</li> <li>• Basic Assessment for the proposed Decommissioning and Demolition of Verwoedberg Substation and 275kV power.</li> </ul>
--	---

### 3. DESCRIPTION OF LOCALITY AND THE PROPERTY ON WHICH THE ACTIVITY IS TO BE UNDERTAKEN AND LOCATION OF ACTIVITY ON THE PROPERTY

This section provides detailed information of the proposed location for the proposed project. The main aim of this section is to provide information on the environmental aspects found within the project and to provide the description of the surroundings.

#### 3.1 LOCALITY OF THE PROPOSED PROJECT

##### 3.1.1 PROVINCE

The proposed project will be undertaken in the Mpumalanga Province which is situated in the north-eastern part of South Africa as depicted on the Locality Map below (Figure 1) and attached as Appendix A.

##### 3.1.2 MUNICIPAL WARD

The proposed project will be undertaken in Siyathemba (Enkanini) Extension 4, which is located within municipal ward number 3 of Dipaleseng Local Municipality under the Gert Sibande District Municipality in the Mpumalanga Province.

##### 3.1.3 AFFECTED FARM

The proposed development only affects one farm called "Farm Vlakfonteing 556IR" which is owned by the Dipaleseng Local Municipality. **Table 2 below** presents the details of the affected farm such as 21 SG Code and portion number. .

**Table 2: The affected farm name, portion number and 21 Surveyor General Code**

Affected Farm Name	Portion Number	21 Surveyor General code
Vlakfonteing 556 IR	Portion number 5	T0IR00000000055600005

### 3.1.4 LOCALITY MAP

Figure 1 below, shows a locality map which of the proposed study area at a scale of 1:50 000. The surroundings of the proposed study area are currently used for various purposes including residential, agriculture and other related activities.



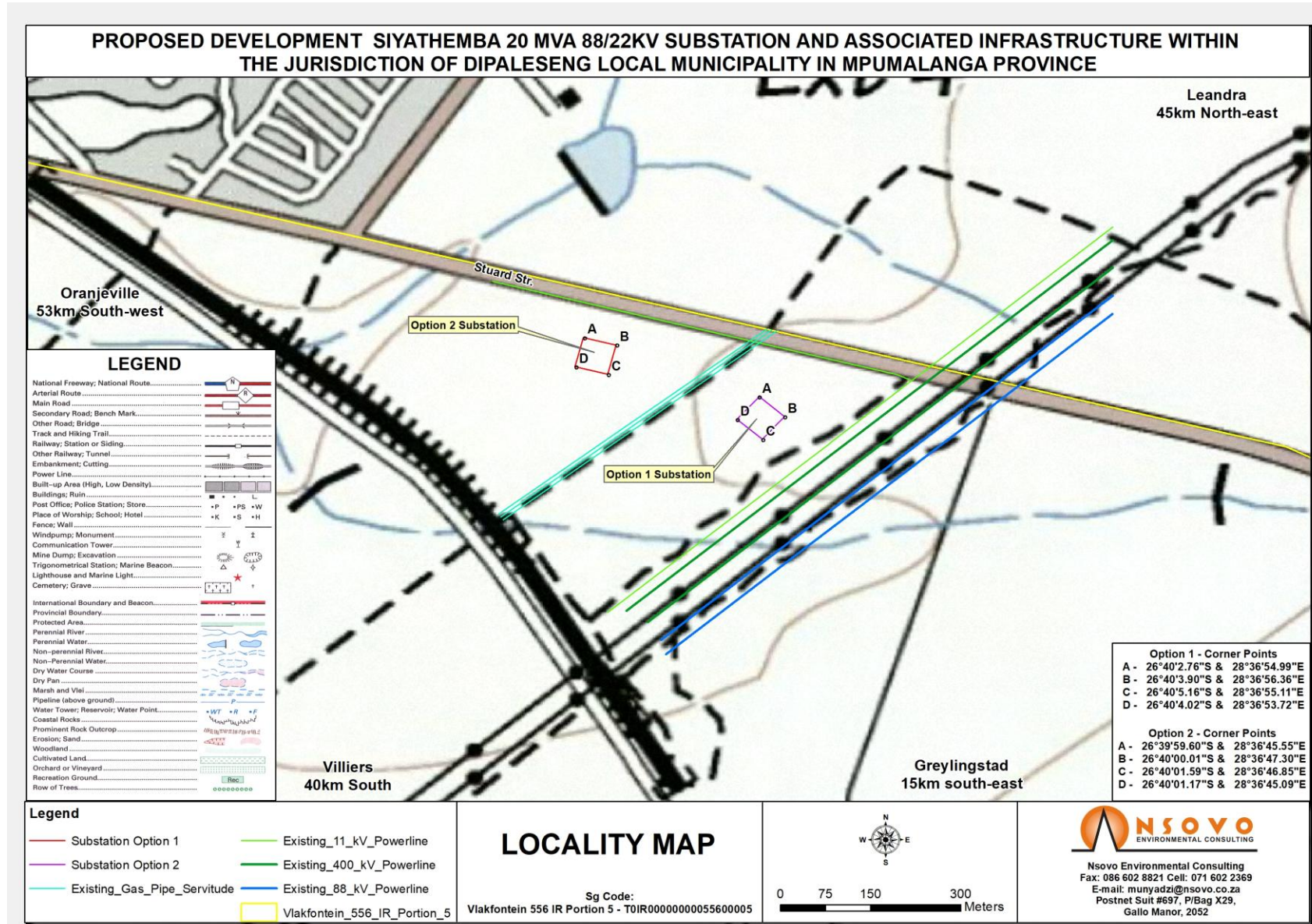


Figure 1: Locality map of the project indicating the proposed two substation options

## 3.2 SURROUNDING LAND USES

This section provides the description of the land uses within and around the proposed study area which includes farming and residential which are discussed below as detailed below:

### 3.2.1 RESIDENTIAL

The residential properties located around the study area are community households (depicted in Figure 2). Subsistence farming is also taking place particularly within the rural communities. Figure 2 below shows one of the townships (Siyathemba Enkanini) near the proposed substation site. All the surrounding residential areas are located more than 100m away from the proposed site



**Figure 2: The view of residential settlements from the proposed site (Site visit, 2018)**

### 3.2.2 COMMERCIAL AND INDUSTRIAL

The main economic sectors within the Gert Sibande District Municipality are presented in **Table 3** below and they include but not limited to: agriculture; community services; construction; mining; finance; manufacturing; transport; and trade.

**Table 3: Main economic sectors of Gert Sibande District Municipality (Integrated Development Plan (IDP), 2017)**

Economic Sectors	Percentage Contribution
Agriculture	41.4%
Community services	12.3%
Construction	02.1%
Finance	21.2%
Manufacturing	57.4%
Mining	14.1%
Transport	24.5%
Trade	25.8%

### 3.2.3 AGRICULTURE

Hay harvesting is the most notable agricultural activity identified around the proposed site. However, the proposed development will not affect such agricultural activity as it located more than 500m away from the proposed site.

## 3.3 SURFACE INFRASTRUCTURE

This section provides the description of the surface infrastructures within and around the study area which include the description of road network, existing switching station, railway line, gas pipeline and powerlines.

### 3.3.1 ROAD NETWORK

Access roads to the proposed study area are the national road (N3) and the provincial road (R51). The R51 connects with Stuart Street situated along the proposed substation sites.

Various highways that pass-through Gert Sibande District Municipality include the N11, which goes through to the N2 in KwaZulu-Natal, the N17 from Gauteng passing through to Swaziland, and the N3 from Gauteng to KwaZulu-Natal.

### 3.3.2 EXISTING ELECTRICITY INFRASTRUCTURE

There are existing power-lines in proximity to the proposed site and these include the 11kV, 88kV and 400kV powerlines. The proposed substation will be constructed along the existing powerlines. Figure 3 below shows the existing 400kV power lines traversing along the study area.



**Figure 3: The existing power lines within the proposed site (Site visit, 2018)**

### 3.3.3 GAS PIPELINE

There is an existing Sasol gas pipeline which is situated in proximity to the proposed Siyathemba substation site. The proposed substation sites (both options 1 and 2) site will be located approximately 90m away from the existing gas pipeline. The stakeholder has been consulted regarding the proposed project proximity to existing gas pipeline.



**Figure 4: The existing gas pipeline within the study area (Site visit, 2018)**

### 3.3.4 RAILWAY LINE

There is an existing Transnet railway line which runs along the proposed site on the easterly direction (Figure 5). This railway line crosses the primary road which passes along the study area. It runs through the Dipaleseng Local Municipality from Gauteng province (Johannesburg) to KwaZulu-Natal province. The stakeholder has been consulted regarding the proposed project proximity to existing railway.



**Figure 5: The view of railway line which runs along the proposed site (Site visit, 2018)**

#### **4. DESCRIPTION OF THE SCOPE PROPOSED ACTIVITIES**

This section provides the description of the proposed activities which include the scope of the proposed project mainly focusing on the listed activities which triggers BA process.

##### **4.1 THE PROPOSED SCOPE OF WORK**

The scope of work entails the following activities:

- Establishment and clearance of the site (100 x 100m) to accommodate 4 x 88kV bays (2 line feeders and 2 transformers) and 6 x 22kV bays in a box structure (4 line feeder bays and 2 spare bays).
- Constructing a 5m wide gravel access road approximately 500m long (depending on the site to be authorised) from the main road to the substation site;

- Construct and equip the 88kV line feeder bays complete with 88kV tubular busbars, isolators, CT's and breakers;
- Construct and equip 2 x 88kV transformer bays complete with 1 x 10MVA 88/22kV transformers, 88kV isolators, breakers, CT's and 22kV NEC/NER/AUX transformers and 22kV breakers;
- Construct a 6 x 22kV box structure feeder bays and equip 4 x 22kV line feeder bays complete using kiosk (Dog box) breakers;
- Construct a 132kV feeder (Operated at 88kV) from Eskom proposed switching station into the newly proposed Siyathemba substation;
- Construct a 2.4m high palisade security fence around the whole substation yard;
- Construct an oil holding dam in the substation yard;
- Installing of the yard floodlights on 14m and 8m masts; and
- Construction of a control room complete.

In order to achieve this development, two substation alternatives were identified and one alternative will be considered following the specialist and EAP impact assessments as well as public engagements.

## **4.2 ACTIVITIES ASSOCIATED WITH THE PROJECT**

The activities associated with the proposed activities during construction phase are discussed hereunder

### **4.2.1 ACCESS ROADS**

As indicated above, primary access to the proposed site will be through the R51 and Stuart Street as well as private farm roads negotiated with the land owner (Municipality).

### **4.2.2 VEGETATION CLEARANCE**

An area of 100 x 100m will be cleared in order for establishment of the proposed Siyathemba substation. Further, clearance will be according to the Environmental Management Programme (EMPr) as well as other relevant policies and guidelines.

### **4.2.3 CONSTRUCTION OF THE SUBSTATION**

The civil works will include the establishment of foundation for the proposed substation.

#### 4.2.4 STEELWORKS STRUCTURES

Various materials will be used during the construction of the substation and some of these will be transported in segments and assembled on site.

#### 4.2.5 COMPLETION OF CONSTRUCTION WORK

Once construction work is completed, the site will be rehabilitated as per the specifications of the EMP and approved method statements, among other activities. The rehabilitation activities will include:

- Removal of excess building material and waste;
- Repairing any damage caused by construction activities;
- Rehabilitating the area affected by temporary access roads;
- Reinstating existing roads; and
- Replacing topsoil and planting indigenous vegetation where necessary.

### 4.3 LISTED ACTIVITY APPLICABLE TO THE PROJECT

The proposed development triggers listed activities in terms of EIA Regulation of December 2014 (as amended). The listed activities applicable to proposed project are listed in **Table 4** below:

**Table 4: Listed Activity triggering EIA applicable to the proposed project**

Listed activities	Activity description
<p><b><u>GN R. 983 Item 11:</u></b></p> <p><i>“The development of facilities or infrastructure for the transmission and distribution of electricity–</i></p> <p><i>(ii) Outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts”.</i></p>	<p>The proposed project entails the development of Siyathemba 20MVA 88/22kV substation outside urban areas</p>



Listed activities	Activity description
<p><b><u>GN R. 985 Item 4:</u></b></p> <p><i>“The development of a road wider than 4 metres with a reserve less than 13, 5 metres.</i></p> <p><i>(f) in Mpumalanga</i></p> <p><i>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans”</i></p>	<p>The proposed project will entail development of 5m wide gravel access road approximately 500m long within Critical Biodiversity Areas (CBA).</p>

## 5. APPLICABLE LEGISLATION AND GUIDELINES

The EIA Regulation of December 2014 (as amended in April 2017), Appendix 1 section 3 (e) requires description of applicable legislations in the BAR. Therefore, this section list and describe the acts and legislations applicable to the proposed development. A list of the current South African environmental legislation, which is considered to be pertinent to the proposed development are described in **Table 5** below.

Municipal policies, plans and by-laws as well as world best practices were also considered during the undertaking of this EIA process. The list of legislations that are applicable to the project is not an exhaustive analysis; however, it provides a guideline to the relevant aspects of each act.

**Table 5: Legislation pertaining to the proposed project**

Aspect	Relevant Legislation	Brief Description
Environment	<ul style="list-style-type: none"> <li>National Environmental Management: Act 1998, (Act No. 107 of 1998).</li> <li>Environmental Impact Assessment Regulations, December 2014 (as amended in April 2017)</li> </ul>	<p>The overarching principles of sound environmental responsibility are reflected in the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) apply to all listed projects. Construction and operation of activities have to be conducted in line with the generally accepted principles of sustainable development, integrating social, economic and environmental factors.</p> <p>The EIA process followed is in compliance with the NEMA and the EIA regulations of December 2014 (as amended). The proposed development involves “listed activity”, as defined by NEMA. Listed activities are any activity which may potentially have detrimental impacts on the environment and</p>

		therefore require EA from the relevant Competent Authority, in this case DEA.
Biodiversity	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The purpose of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment (NSBA) was developed.
Protected Areas	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)	The purpose of this Act is to provide for the protection, conservation and management of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes.
Heritage Resources	National Heritage Resources Act, 1999 (Act No. 25 of 1999)	The National Heritage Resources Act, 1999 (Act No. 25 of 1999) legislates the necessity for cultural and Heritage Impact Assessment (HIA) in areas earmarked for development, which exceed 0.5 ha. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).
Air quality management and control	National Environmental Management: Air Quality Act, 2004	The objective of the Act is to protect the environment by providing reasonable measures for the protection and enhancement of air quality and to prevent air pollution. The Act makes provision for measures to control dust, noise and

	(Act 39 of 2004)	<p>offensive odours.</p> <p>Section 32 of the National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) deals with dust control measures in respect of dust control. Whilst none are promulgated at present, it provides that the Minister or MEC may prescribe measures for the control of dust in specified places or areas, either in general or by specified machinery or in specified instances, the steps to be taken to prevent nuisance or other measures aimed at the control of dust.</p>
Noise Management and Control	Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	The assessment of impacts relating to noise pollution management and control, where appropriate, must form part of the EMP. Applicable laws regarding noise management and control refer to the National Noise Control Regulations issued in terms of the Environment Conservation, 1989 (Act 73 of 1989).
Water	National Water Act, 1998 (Act 36 of 1998)	<p>This Act provides for fundamental reform of law relating to water resources and use. The preamble to the Act recognises that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users.</p> <p>There are watercourses (wetland and non-perennial river) located proximity</p>

		to the proposed site; therefore, the necessary licence will be obtained in due course.
Agricultural Resources	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	The Act aims to provide for control over the utilization of natural agricultural resources in order to promote the conservation of the soil, water resources and vegetation and to combat weeds and invader plants. Section 6 of the Act makes provision for control measures to be applied in order to achieve the objectives of the Act.
Human	The Constitution of South Africa, 1996 (Act No. 108 of 1996)	<p>The Constitution of South Africa, 1996 (Act No. 108 of 1996) provides for an environmental right (contained in the Bill of Rights, Chapter 2). The state is obliged “to respect, protect, promote and fulfil the social, economic and environmental rights of everyone”</p> <p>The environmental right states that:</p> <p>“Everyone has the right -</p> <p>a) To an environment that is not harmful to their health or well-being; and</p> <p>b) To have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -</p> <ul style="list-style-type: none"> <li>• Prevent pollution and ecological degradation;</li> <li>• Promote conservation; and</li> </ul>

		<ul style="list-style-type: none"> <li>Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”</li> </ul>
<p>Waste</p>	<p>National Environmental Management: Waste Act 59 of 2008</p>	<p>This act provides fundamental reform of the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. This act also ensures the provision of national norms and standards for regulating the management of waste by all spheres of government.</p> <p>The National Environmental Management: Waste Act provides for specific waste management measures; licensing and control of waste management activities; remediation of contaminated land; compliance and enforcement; and for matters connected therewith.</p>

## **6. DESCRIPTION OF THE NEED AND DESIRABILITY OF THE PROPOSED ACTIVITY**

This section provides justification for the need of the proposed project with focus on the benefits and its importance to the people of Mpumalanga Province and the country at large.

### **6.1 MOTIVATION FOR THE DEVELOPMENT**

The Balfour town substation recorded an increase in electricity consumption and a need for a network expansion plan was then justified. Dipaleseng Local Municipality also experienced several unplanned outages due to a significant load increase on the north side of Balfour town. The infrastructure is obsolete and have a negative impact on the quality of supply, essentially, the existing 2 x 5MVA transformers installed at Balfour substation are too small to cater for the current loading in Balfour and Siyathemba area. The current electricity network does not have spare capacity to accommodate future residential developments and potential industries. Consequently, the Dipaleseng Local Municipality has proposed to develop construct the Siyathemba 20MVA 88/22kV substation and associated infrastructure in order to increase power supply in the area.

### **6.2 BENEFITS OF THE PROJECT**

The proposed project is beneficial as it will allow for the increase of electricity supply in covering expansion around Balfour and Siyathemba. Further, the proposed development will result in a positive socio-economic impact as the demand for equipment, building material and labour will increase. Secondary service provision such as food supply, toilet hire, equipment maintenance and many more items would also stimulate the local economy especially during the construction phase. This development will indirectly benefit communities as reliable electricity will result in uninterrupted production and therefore growth in industry, which could potentially yield additional jobs. The overarching impact will be positive economic spinoffs, which benefit the community, the region and country at large.

Electrification has significant positive benefits from a socio-economic and ecological perspective. The provision of electricity leads to a number of social benefits for organs of state, individuals, industries and communities since it enables development and encourages small and medium enterprise development, and as a result, contributes to a possible increase in disposable income.

## **6.2.1 SUPPORTING STRATEGIES**

At the regional level, the project would contribute to reliability of power supply. There would also be a less tangible but nonetheless important benefit of positioning the Municipality ahead in terms of sustainable energy supply. At the national level, the project would contribute to implementing South Africa's new energy policy as embodied in the White Paper on Energy (DME 1998). The priorities to which this project would contribute are laying the groundwork for enhancing supply and electrification capacity.

## **7. DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ACTIVITY, SITE AND LOCATION WITHIN THE SITE**

The identification of alternatives is an important component of the EIA process. The identified alternatives were assessed in terms of environmental acceptability, technical as well as economic feasibility during the EIA process wherein the preferred alternative is highlighted and presented to the Authorities.

Two substation alternatives as well as the no-go alternative are being considered for the proposed development. The project has considered site alternatives (Section 7.1) of which were found to be economically and environmentally viable compared to the other options. The alternatives are presented as part of this BAR.

The selection of project alternatives was primarily based on the Dipaleseng Local Municipality prefeasibility study that determined the broad location based on the need. Subsequent site visit was undertaken by the environmental and specialist teams. Further, a detailed public consultation was undertaken to assess the viability of the selected substation sites.

## **7.1 DETAILS OF ALTERNATIVES CONSIDERED**

This section describes the alternatives considered which includes the site and no-go alternatives which are discussed as follows:

### **7.1.1 SUBSTATION ALTERNATIVES**

This section provides detailed information of the substation alternatives considered for the proposed development as well as the no-go alternative as follows:



Two substation alternatives were identified and assessed, namely substation option 1 and 2. There is no much difference between the proposed substations options 1 and 2 as they are situated within the same type of vegetation, soil, avifaunal species etc. **Table** below indicates the coordinates and size of the proposed substations.

**Table 6: Corner points of the proposed substations**

Substations options	Latitude	Longitude	Size of the substation
<b>Substation option 1</b>			
Corner A	26°40'00.10"S	28°36'47.45"E	100m <sup>2</sup>
Corner B	26°40'00.49"S	28°36'49.20"E	
Corner C	26°40'02.06"S	28°36'48.74"E	
Corner D	26°40'01.66"S	28°36'46.99"E	
<b>Substation option 2</b>			
Corner A	26°40'01.42"S	28°36'56.33"E	100m <sup>2</sup>
Corner B	26°40'02.48"S	28°36'57.69"E	
Corner C	26°40'03.69"S	28°36'56.51"E	
Corner D	26°40'02.63"S	28°36'55.15"E	

#### 7.1.3.2.1. Substation option 1

Substation option 1 requires 100 square meter footprint and will be situated in the Critical Biodiversity Area (CBA). This option is situated close to the disturbed area as there is several existing Eskom powerlines. This proposed Siyathemba substation will be connected to Eskom's proposed switching station via a 132kV feeder (Operated at 88kV).

#### 7.1.3.2.2. Substation option 2

Similar to substation option 1, this substation also requires a 100 square meter for construction purposes and located within the CBA. This proposed Siyathemba substation will be connected to Eskom's proposed switching station via a 132kV feeder (Operated at 88kV. **Table 7** below presents the comparison of the two substation alternatives.

**Table 7: Comparison of the proposed substation options**

substation option 1	substation option 2
Substation option 1 is closer to the existing disturbance of the Eskom 400 and 88kV lines.	Substation 2 is located further from the existing Eskom lines
Located approximately 400m from the Ecological Support Areas (ESA)	Situated approximately 200m from the ESA
Situated approximately 500m from the NFEPA wetlands with the existing powerlines in the middle	Situated approximately 300m from the seep wetland type and channelled valley-bottom wetland

**Table 8: Selection of preferred Alternatives from specialist findings**

Specialist studies	Description of selection of alternatives
Biodiversity	<p>The impacts of the substation and associated infrastructure on terrestrial ecosystems will be low and the development is deemed acceptable from an ecological perspective and as such should not be prevented from proceeding based on the ecological considerations as covered in this report.</p> <p>Substation Option 1 includes similar features in the footprint to Option 2 but is considered preferable as it is closer to the existing disturbance of the Eskom 400 and 88kV lines. Substation Option 2 is considered a favourable alternative but as it is further from the existing Eskom lines it is considered somewhat less favorable. However, the difference between Option 1 and Option 2 is small and should Option 1 not be feasible for some reason, this is still considered to be a viable and acceptable substation alternative.</p>
Heritage	<p>The Heritage Impact Assessments (HIA) was conducted within the proposed study area (i.e. substation footprints) The project area has considerable existing built-up areas and as such no significant impacts are anticipated on the built environment given the existence of contemporary built-infrastructure or structures already in the project area. The selection of preferred alternative was done based on the cultural heritage significance of each proposed alternative. The footprint of the proposed project (i.e. substation options) was assessed and rated as having low to medium cultural heritage significance. It is on this basis that all options (1 and 2) for substation are feasible.</p>
Wetland	<p>Potential impacts of the proposed activity on wetlands and riparian areas were assessed and all of the impacts considered during the construction and operational phases were assessed to have extremely low potential impacts on the watercourses situated within 500m from the study area based on the distance of watercourses (minimum 170m) from the respective proposed substation sites. Therefore, the proposed substations alternatives (option 1 and 2) were considered feasible from the wetland perspective.</p>

### 7.1.1.1 No-go alternative

In accordance with GN R.982, consideration must be given to the option not to act. This option is usually considered when the proposed development is envisaged to have significant negative environmental impacts that mitigation measures identified cannot ameliorate effectively. The no-go alternative would be the option of not undertaking the development of the proposed project. It would imply that the current electricity supply network is not provided, industrial development in the area will be hindered and the integration of potential renewable energy in the area will not be possible. Should the no-go alternative be adopted, the Mpumalanga grid will be deprived of a much-needed essential service, particularly given the already existing energy supply challenge countrywide.

## 7.2 PUBLIC PARTICIPATION PROCESS

The December 2014 EIA Regulations (as amended) require that during an EIA process, the organs of State together with Interested and Affected Parties (I&APs) and the general public be informed of the application for EA and also be afforded an opportunity to comment on the application.

Public Participation Process (PPP) is any process that involves the public in problem solving and decision-making and it forms an integral part of the EIA process. The PPP provides people who may be interested in or affected by the proposed development, with an opportunity to provide comments and to raise issues or concern, or to make suggestions that may result in enhanced benefits for the project. The primary purpose of the PPP report is as follows:

- To outline the PPP that was undertaken;
- To synthesise the comments and issues raised by the key stakeholders, I&APs; and
- To ensure that the EIA process fully address the issues and concerns raised.

Chapter 6, regulation 39 through 44, of the December 2014 EIA Regulations (as amended) stipulates the manner in which the PPP should be conducted as well as the minimum requirements for a complaint process. These requirements include but not limited to:

**(a) Fixing a notice board at or on the fence of-**

- (i) The site where the activity to which the application relates is or is to be undertaken; and
- (ii) A place conspicuous to the public at the boundary of the site

**(b) Giving written notice to-**

- (i) The occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
- (ii) The owners or persons in control of that land occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;
- (iii) The municipal councillor of the ward in which the site and alternative site is situated and any organisation of rate payers that represent the community in the area;
- (iv) The municipality which has jurisdiction in the area;
- (v) Any organ of state having jurisdiction in respect of any aspect of the activity; and
- (vi) Any other party as required by the competent authority.

**(c) Placing an advertisement in-**

- (i) One of the local Newspapers within or around the proposed site.

**7.2.1 PUBLIC PARTICIPATION PRINCIPLES**

The principle of the Public Participation holds that those who are affected by a decision have the right to be involved in the decision-making process (i.e. the public's contribution will influence the decision). One of the primary objectives of conducting the PPP is to provide interested and affected parties with an opportunity to express their concerns and views on issues relating to the proposed project. The principles of public participation are to ensure that the PPP:

- Communicates the interests of and meet the process needs of all participants.
- Seek to facilitate the involvement of those potentially affected.
- Involves participants in defining how they participate.
- Is as inclusive and transparent as possible, it must be conducted in line with the requirements of Regulation 39 - 44 of the December 2014 (as amended in April 2017) EIA Regulations.

## 7.2.2 APPROACH AND METHODOLOGY

The Public Participation approach adopted in this process is in line with the processes contemplated in EIA Regulation 39 - 44 of the December 2014 as amended EIA Regulations, in terms of NEMA, which provides that I&APs must be notified about the proposed project:

## 7.2.3 IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

I&APs identified include pre-identified stakeholders (government department), landowners and the general public. Notification and request for comments were submitted to the following key stakeholders:

- National Department of Environmental Affairs;
- National Department of Water and Sanitation;
- Department of Transport and Public Works;
- Mpumalanga Department of Transport and Public Works;
- Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs;
- South African Heritage Resource Agency;
- Sasol Gas;
- Transnet SOC Limited;
- Eskom SOC Limited – Transmission

The notifications were sent by registered mail, refer to **Appendix D3**

## 7.2.4 PUBLIC PARTICIPATION PROCESS

Regulation 42 of GN R. 982 requires that a register of I&APs be kept by the public participation practitioner. In fulfilment of this requirement, such a register is compiled and details of the I&APs including their comments will be updated throughout the project cycle. The database is attached as **Appendix D5**.

## 7.2.5 SITE NOTICES

On 5<sup>th</sup> April 2018, three site notices (A2 and A3 size) were fixed at different conspicuous locations within and around the proposed project study area. Photographic evidence of the site notices is attached as **Appendix D1**. A5 notices were distributed to I&APs within a 100m distance from the site.

## 7.2.6 DISTRIBUTION OF NOTICES TO SURROUNDING LAND OWNERS / OCCUPIERS

Notification letters were posted via registered mail to stakeholders on the 12<sup>th</sup> April 2018 (Refer to **Appendix D3** for proof of postage). These notifications were informing stakeholders and the public of the project as well as affording them an opportunity to register as I&AP and also to comment or raise any issues pertaining to the proposed project.

## 7.2.7 PLACEMENT OF ADVERTISEMENT IN THE LOCAL NEWSPAPER

An advertisement was placed on the **African Times Newspaper** on the 12<sup>th</sup> April 2018. The advertisement was aimed at further informing the I&APs of the proposed activity. A 30-day period was allowed for the public to submit their comments, issues and concerns. Proof of newspaper advertisement is attached as **Appendix D2**.

## 7.2.8 PLACEMENT OF DRAFT BASIC ASSESSMENT REPORT FOR COMMENTS

I&APs and general public will be notified of the availability of the draft BAR for review and comment through newspaper advert, registered mail, emails and other necessary mode of communication. Copies of the draft BAR will be placed at various accessible locations around the project site. The draft BAR will also be made available in a soft copy on Nsovo website. Further, copies of the draft BAR will be submitted to several of organs of state for review and comments including:

- National Department of Environmental Affairs;
- Mpumalanga Department of Economic Development, Environment and Tourism;
- National Department of Water and Sanitation;
- Department of Transport and Public Works;
- Mpumalanga Department of Transport and Public Works;
- Mpumalanga Department of Water and Sanitation;

- Mpumalanga Department of Agriculture and Rural Development and Land Administration
- South African Heritage Resource Agency; and
- Eskom Holdings SOC Limited.
- Transnet SOC Limited – Transmission

### **7.2.9 PUBLIC MEETINGS**

No public meetings have been held yet. However, should it be necessary, public meetings will be scheduled and this will be communicated with the I&APs.

### **7.3 A SUMMARY OF ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES**

Comments, issues and concerns raised together with the responses provided by the EAP are presented under **Appendix D4**.

## **8. DESCRIPTION OF THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES FOCUSING ON THE GEOGRAPHICAL, PHYSICAL, BIOLOGICAL, SOCIAL, HERITAGE AND CULTURAL ASPECTS**

This section outlines parts of the socio-economic and biophysical environment that could be affected by the proposed development. Using the project description in Section 4, and knowledge of the existing environment, potential interactions between the project and the environment are identified below. The potential effects of the project on the human environment, socio-economic conditions, physical and cultural resources are included.

### **8.1.1 SOCIO-ECONOMIC DESCRIPTION**

This section presents the socio-economic aspects focusing on the Province and Municipalities within the proposed study area.

#### **8.1.1.1 Provincial Description of the Proposed Project**

Mpumalanga is located in the north-eastern part of South African province. As shown in **Figure 8** below, it borders onto African countries such as Mozambique and Swaziland and other South African provinces



namely; Gauteng, Limpopo, KwaZulu-Natal and Free State Provinces. Mpumalanga is characterized by the high plateau grasslands of the Middleveld, which roll eastwards for hundreds of kilometres. In the north-east, it rises towards mountain peaks and terminates in an immense escarpment ([www.municipalities.co.za](http://www.municipalities.co.za)).

Mpumalanga is divided into three district municipalities namely: Gert Sibande, Ehlanzeni and Nkangala Districts. The proposed development will be conducted within one of these municipalities (i.e. Gert Sibande). These three districts are further subdivided into 17 Local Municipalities of which only Dipaleseng Local Municipality will be impacted by the proposed development. The province covers an area of 76 495km<sup>2</sup> which has population of approximately 4335 965 (IDP, 2017). The capital city of Mpumalanga is Mbombela (previously Nelspruit) and other major cities and towns include eMalahleni (previously Witbank), Standerton, eMkhondo (previously Piet Retief), Malalane, Ermelo, Barberton and Sabie.

In addition, Mpumalanga is rich in coal reserves and home to South Africa's major coal-fired power stations with eMalahleni the biggest coal producer in Africa and is also the site of the country's second oil-from-coal plant after Sasolburg ([www.municipalities.co.za](http://www.municipalities.co.za)). Further; the best-performing sectors in the province include mining, manufacturing and services.



Figure 6: Map of South Africa and its provinces (Source: [www.odm.org.za](http://www.odm.org.za))

#### 8.1.1.2 Districts Municipality within the study area

This section provides the description of the municipality within the proposed study area which are Gert Sibande District and Dipaleseng Local Municipalities.

##### ❖ Gert Sibade District Municipality

The Gert Sibande District Municipality is a Category C Municipality located in the Mpumalanga Province. It is borders onto Mpumalanga districts namely: Ehlanzeni and Nkangala District Municipalities to the north and South Africa provinces such as KwaZulu-Natal and Free State provinces to the south as well as Gauteng province to the west ([www.odm.org.za](http://www.odm.org.za)). It also borders with other countries such as Swaziland to the east and Mozambique to the west.

According to the IDP (2017), this is the largest district in the Mpumalanga province and it is comprised of seven local municipalities namely: Govan Mbeki; Chief Albert Luthuli; Msukaligwa; Dipaleseng (proposed

area of the project); Mkhondo; Lekwa and Dr Pixley ka Isaka Seme Local Municipality.

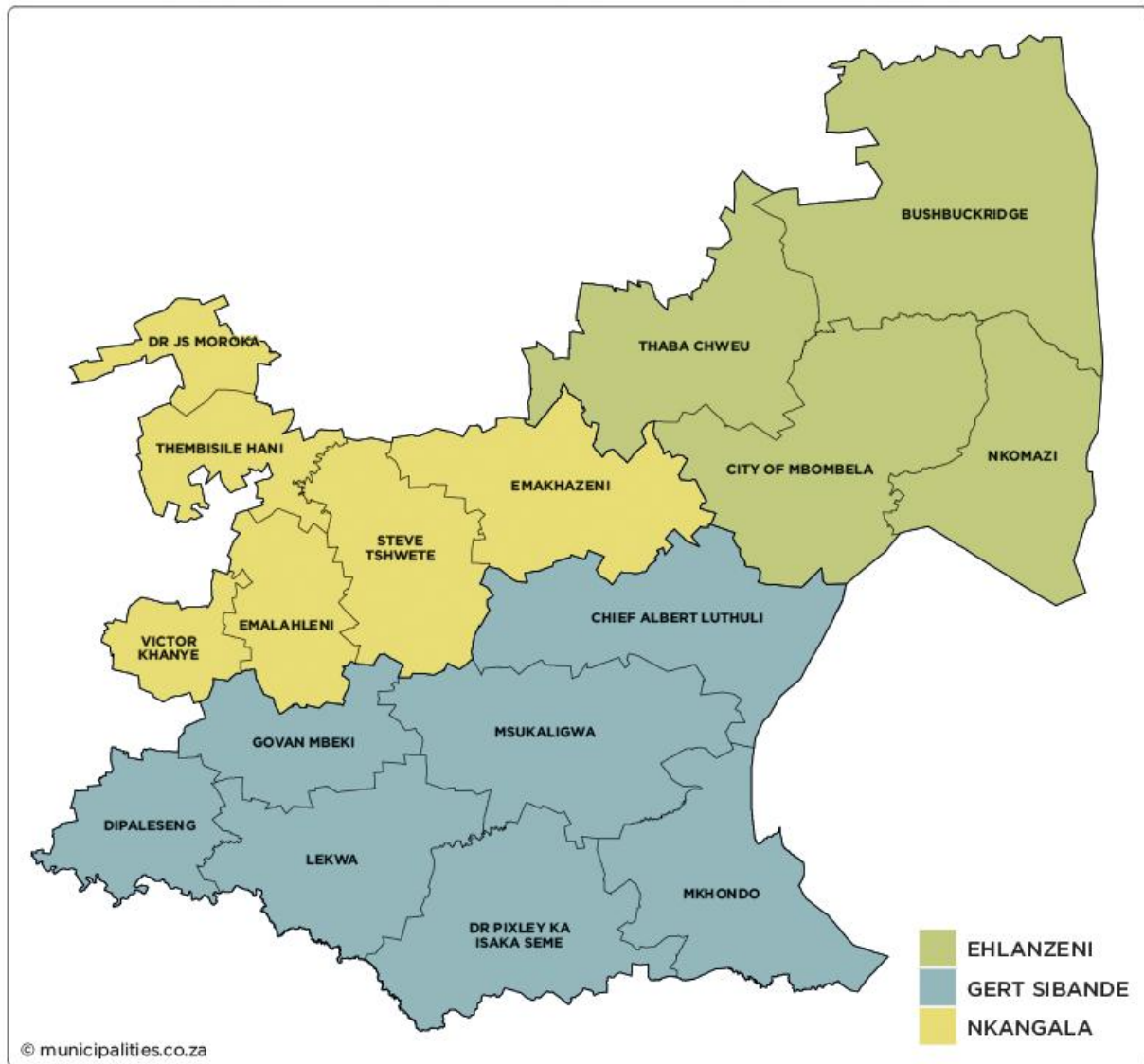


Figure 7: The Districts of Mpumalanga Province ([www.municipalities.co.za](http://www.municipalities.co.za))

## 8.2 DIPALESENG LOCAL MUNICIPALITY

The Dipaleseng Local Municipality is a Category B municipality located within the Gert Sibande District and covers an area of approximately 2 645km<sup>2</sup> ([www.municipalities.co.za](http://www.municipalities.co.za)). As shown in **Figure 10**, Dipaleseng Local Municipality bordered by Lekwa and Govan Mbeki local municipalities to the east. It also bordered with the South African provinces such as Free State Province to the south and the Gauteng Province to the

west. It is the smallest of seven municipalities in the district. The main economic sectors within the municipality are agriculture and mining. The proposed development will be undertaken in Balfour/Siyathemba within municipal ward 3. Balfour is the seat of the municipality and is its major town

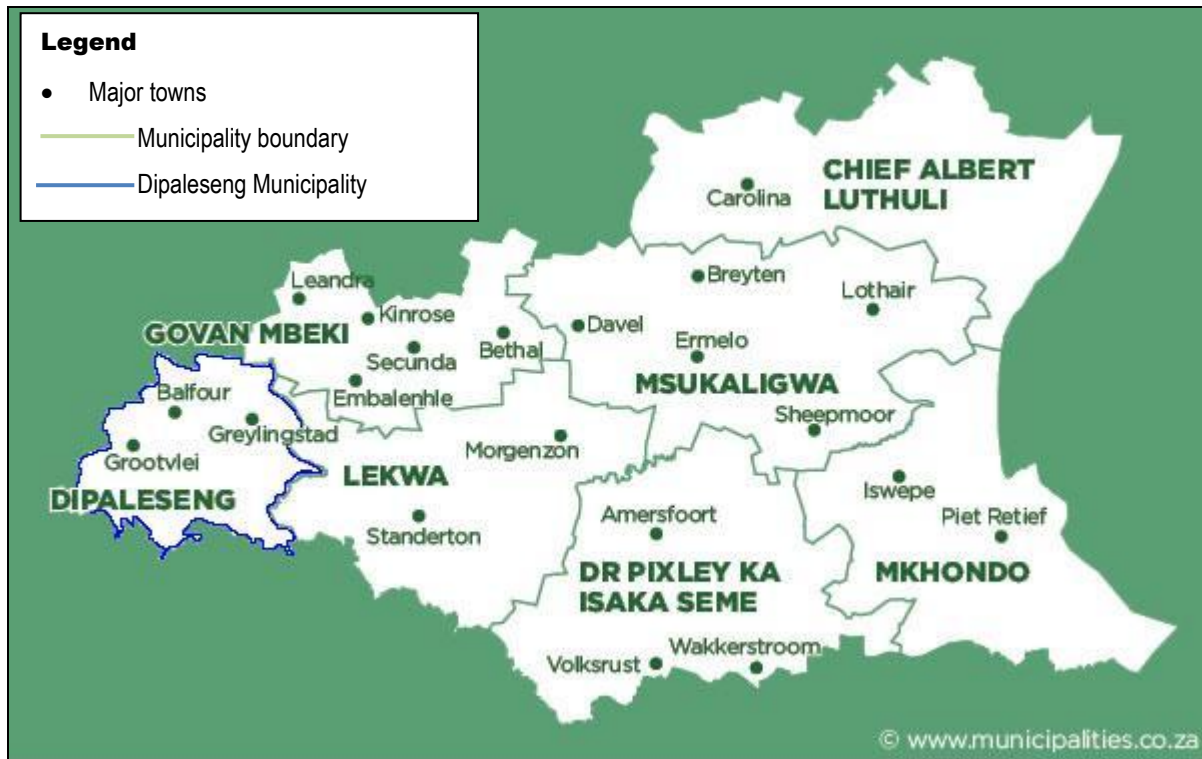


Figure 8:Map showing the Dipaleseng Local Municipality and major towns ([www.municipalities.co.za](http://www.municipalities.co.za))

### 8.2.1 GEOLOGY WITHIN THE STUDY AREA

Geologically, the proposed study area is situated on the Andesite which entails the andesitic to deictic lava, tuff, chert, agglomerate and quartzite of the Ventersdorp Supergroup. As shown in **Figure 11**, the proposed site is completely covered with the land type known as Ba27.

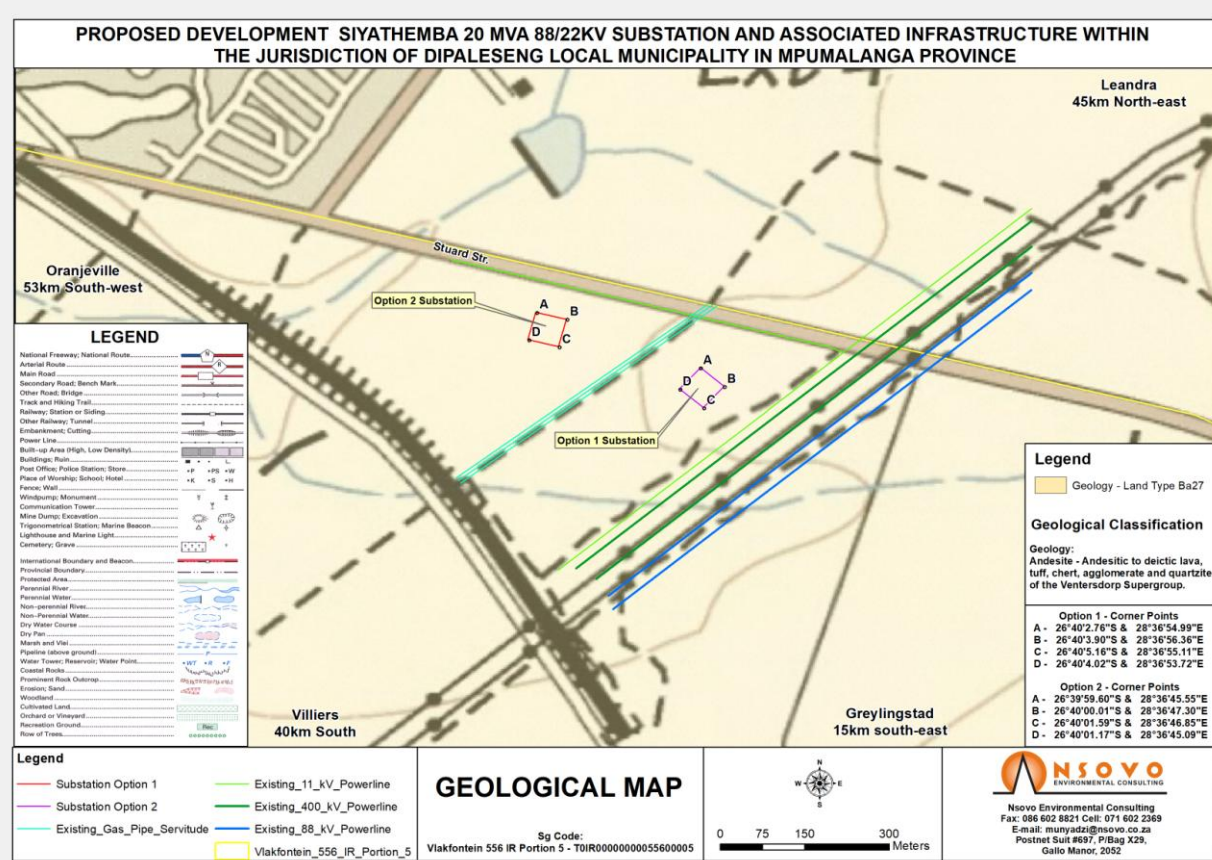


Figure 9: Geological map of the study area

### 8.2.2 TOPOGRAPHY OF THE STUDY AREA

The affected area is fairly flat with shallow soils and a series of low rocky areas distributed across the therefore development will not have significant impact on the topography.

### 8.2.3 SURFACE WATER WITHIN THE AREA

The whole of the study area is completely covered with the C21B quaternary catchment (Figure 12) with the rainfall of approximately 696.mm per annum. There is the Suikerbosrand non-perennial river around the proposed study area. In addition, there is also artificial wetland located approximately 250m from the study area. The hydrological map on a scale of 1:50 is attached as **Appendix A**

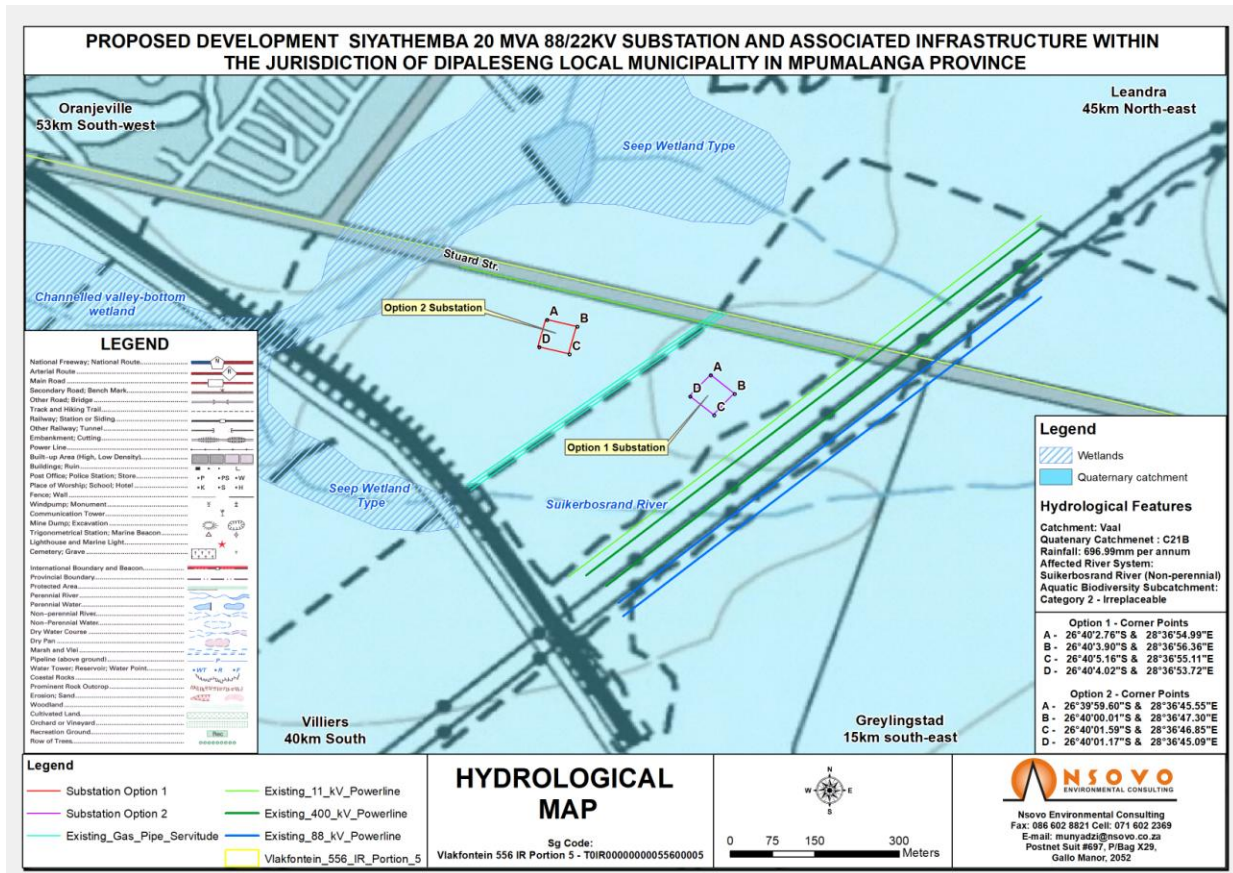


Figure 10: Hydrological map of the proposed location

## 8.2.4 AIR QUALITY AND POLLUTION

Air quality is defined to include noise and odour as well as addressing all sources of air pollution (i.e. point, area and mobile sources). The Mpumalanga Air Quality Management Plan has been developed to comply with the National Environmental Management: Air Quality Act, 39 of 2004 and more specifically, to provide guidance on Air Quality Management in the Gert Sibande District Municipality. The Plan identifies air pollution sources in the proposed locations as follows:

- Railway line (Train);
- Agricultural activities;
- Biomass burning (veld fires);
- Domestic fuel burning (wood and paraffin);

- Vehicle emissions;
- Waste treatment and disposal;
- Dust from infrastructural development;
- Dust from unpaved roads; and
- Other fugitive dust sources such as wind erosion of exposed areas.

There are few sources of air pollutants within the immediate and around the proposed area. Ambient particulate concentrations are likely to be low in residential areas where wood is used as primary fuel source. The motor vehicle along the R51 road and Stuart Street may result in elevated ambient concentrations of particulates and Nitrogen Oxides (NO<sub>2</sub>) at times.

#### **8.2.5 VEGETATION STRUCTURE AND COMPOSITION**

The project area is located within a single primary vegetation division namely the Savanna Biome which is defined by SABAP1 as having a grassy under-storey and a distinct woody upper-storey of trees and tall shrubs (Harrison *et al* 1997). Any remaining natural woodland occurring within the project area is likely to be comprised of Andesite Mountain Bushveld vegetation which occurs across Gauteng, North-West, Mpumalanga and Free State Provinces. Relevant to the project area, small and isolated pockets of savanna or open woodland exist, none of which occur within the areas earmarked for the proposed project. . In terms of birds, the savanna/woodland biome is regarded as the most species-rich community in southern Africa and is particularly rich in raptors.

However, a fairly substantial expanse of natural and intact grassland occurs within the proposed project area, particularly the area earmarked for the proposed development. Mesic grassland, associated with the wetland habitat located adjacent to the Siyathemba settlement to the North West of the proposed development site, is another key habitat feature within the broader project area, which could potentially support African Marsh-Harrier and White Stork.

The site consists of open grassland with shrubs and small trees present only on larger rocky outcrops where there is some refuge from fire. There are some service roads, previous excavations and other types of disturbance present at the site, but overall it can be considered largely natural. The affected area is fairly flat with shallow soils and a series of low rocky areas distributed across the site. There is a small wetland

about 230m from Substation Alternative 1, but this is well beyond the development footprint and would not be affected by the development.

The vegetation of the site is dominated by grasses with a well-developed forb component and occasional trees and low shrubs concentrated on the more rocky ground. Grasses present include *Cymbopogon pospischilii*, *Digitaria eriantha*, *Setaria nigrirostris*, *Tristachya leucothrix*, *Andropogon schirensis*, *Melinis repens*, *Themeda triandra*, *Brachiaria serrata*, *Heteropogon contortus* and *Cynodon dactylon*. Low trees and shrubs present include *Searsia discolor*, *Searsia pyroides*, *Celtis africana*, *Rhamnus prinoides*, *Diospyros lycioides*, *Euclea crispa subsp. crispa*, *Lantana rugosa*, *Pollichia campestris*, *Teucrium trifidum*, *Osteospermum scariosum*, *Asparagus laricinus* and *Indigofera hedyantha*. Forbs and geophytes present include *Boophone disticha*, *Gladiolus crassifolius*, *Eucomis autumnalis*, *Kniphofia ensifolia*, *Aloe greatheadii var. davyana*, *Berkheya pinnatifida*, *Berkheya radula*, *Monsonia angustifolia*, *Hermannia linnaeoides*, *Gerbera viridifolia*, *Blepharis integrifolia*, *Dicoma anomala*, *Hibiscus microcarpus*, *Helichrysum aureonitens*, *Helichrysum callicomum*, *Helichrysum nudifolium var. nudifolium*, *Hilliardiella aristata*, *Acalypha caperonioides var. caperonioides*, *Rhynchosia totta var. totta*, *Striga bilabiata subsp. bilabiata*, *Solanum sisymbriifolium*.

Alien species abundance at the site is relatively low, but several species were observed to be present including *Datura stramonium*, *Tagetes minuta*, *Bidens pilosa*, *Conyza bonariensis*, *Cirsium vulgare*, *Bromus catharticus* and *Pennisetum clandestinum*.

#### 8.2.6 PRESENCE OF SENSITIVITY AREAS

The majority of the proposed study area is situated on Critical Biodiversity Area (CBA) and surrounding the study area there is Ecological Support Area. It was noted that there are no NFEPA rivers close to the site but there is Non-perennial River (Suikerbosrant River) located approximately 220m to the south of substation option 1 (see Figure below). The entire site is covered by aquatic biodiversity catchment. The sensitivity map on a scale of 1:50 is attached as **Appendix A**.



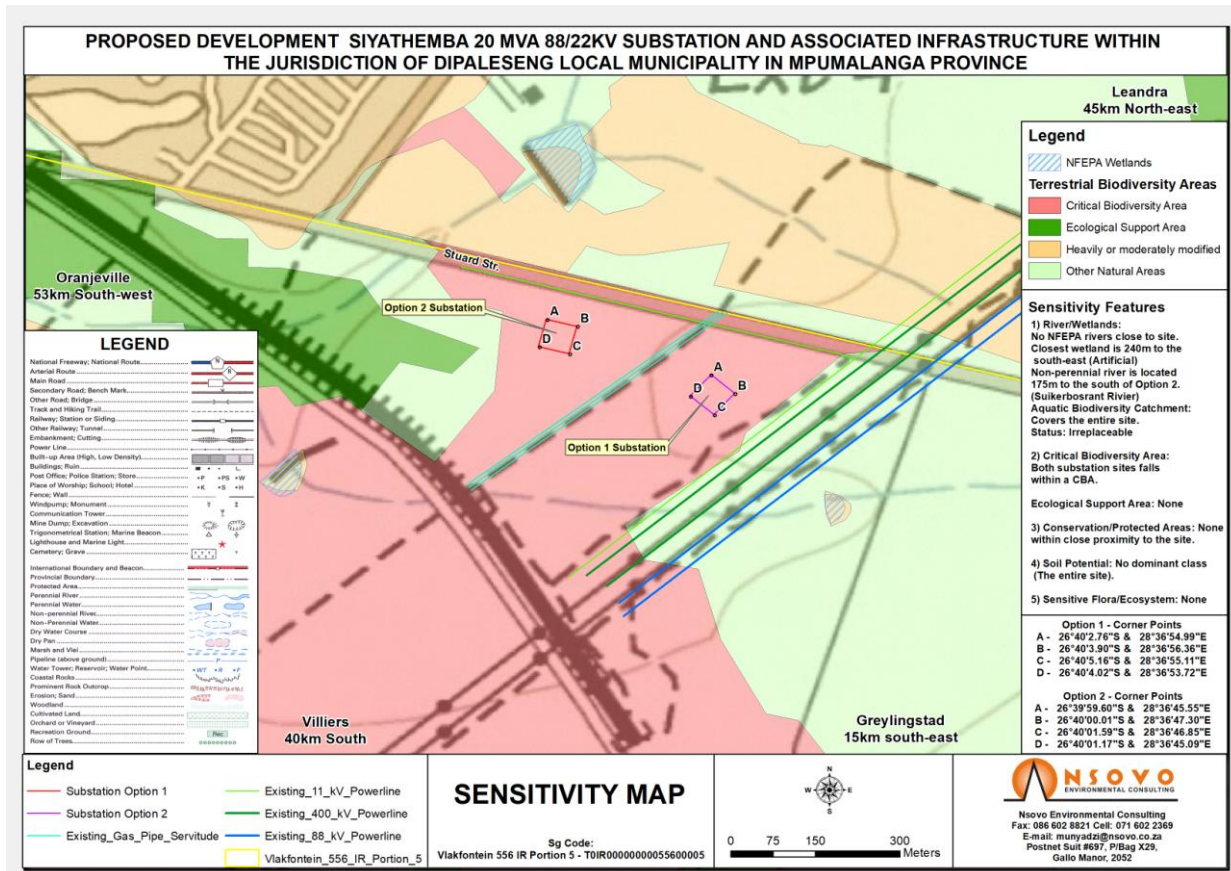


Figure 11: Sensitivity map of the proposed site

According to the specialist the site lies within a Critical Biodiversity Area which forms part of the optimal design of the spatial plan. In other words, the site is not considered irreplaceable, but is required to meet vegetation targets and forms part of the optimal design of the plan, with the result that while there may be other areas that can meet the required targets, these would need to be larger than the current CBA or would not be contiguous with other required areas. The impact of the development on the affected CBA is therefore considered to be relatively low and would be of a local nature only.

The sensitivity map for the study area is illustrated below in Figure 16. There is not a lot of variation in vegetation composition and hence sensitivity across the study area. Although the rocky areas are considered somewhat more sensitive than the surrounding grassland, this is not a large difference as the rocky outcrops are not well developed and do not have a well-developed associated flora or faunal community. Overall the affected area is considered moderate sensitivity and there is also little difference between the two substation alternatives as both will impact a similar array of habitats.

---

## 8.2.7 HERITAGE AND ARCHAEOLOGICAL ASPECTS

The Heritage Impact Assessments (HIA) was conducted within the proposed study area (i.e. alternatives footprints). The project area has considerable existing built-up areas and as such no significant impacts are anticipated on the built environment given the existence of contemporary built-infrastructure or structures already in the project area.

## 9. DESCRIPTION OF THE ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS INCLUDING CUMULATIVE IMPACTS IDENTIFIED

This section describes the potential impacts that the proposed project may pose on the receiving environment. Impacts associated with the relevant environmental components within the study area as identified, have been assessed based on the EAP's opinion as well as consultation with specialist studies. Refer to **Table 9** below, for the potential impacts identified. These impacts are similar for all three alternatives and will be comprehensively assessed during the EIA phase.

## 9.1 POTENTIAL ENVIRONMENTAL IMPACTS IDENTIFIED

Potential environmental impacts identified are described in **Table 9** below.

**Table 9 : Potential environmental impact identified**

Issue	Rating	Description
Employment	Positive-No mitigation required	Job creation and investments into the project will result in opportunities during the planning and design phase. This impact will typically be limited to skilled engineers and planning professionals. Proposed project will result in very limited opportunities to the skilled local community during the construction phase. This impact will be positive and provincial in extent.
Air Pollution	Neutral	Potential air pollutant during construction may be dust emanating from site preparation and excavations during construction. Given the nature and magnitude of the proposed project, it is anticipated that before mitigation the impact will be local in extent and short term. Mitigation measures such as dust suppression can reduce the impact to become site specific.
Visual Impact	Negative	<p>The visual impact of an object in the landscape decreases quickly as the distance between the observer and the object increases. The visual impact at 1 km is approximately a quarter of the impact viewed from 500m; and the visual impact at 2km is one eighth of the impact viewed from 500m. Therefore, objects appear insignificant in any landscape beyond 5km.</p> <p>The visibility of the proposed structure and infrastructure would be a function of several factors, including:</p>

Issue	Rating	Description
		<p>landform, vegetation, views and visibility, genius loci (or sense of place), visual quality, existing and future land use, landscape character and scale.</p> <p>The elevated points of the site can be viewed from the nearby roads, however, it must be noted that there are already existing overhead power lines (400kV, 11kV and 88Kv) located within the vicinity of the proposed project site. Given the topography of the study area the impact can be considered definite, long term, local in extent but low significance.</p>
Fauna	Negative	<p>No sensitive species or sensitive areas are flagged. The project will not substantially change the reigning ecological character of the general area. Further, the proposed project will not significantly impact negatively on the assemblages and conservation of the general area. Considering the insignificant extent of the relatively narrow and linear servitude it is not expected that endangered species of conservation will be put at risk; however, should any species of conservation concern be encountered, these will be protected.</p>
Flora	Negative	<p>Potential ecological impacts resulting from the proposed development would stem from a variety of different activities and risk factors associated with the pre-construction, construction and operational phases of the project potentially including the following:</p> <p><b>Construction Phase</b></p> <ul style="list-style-type: none"> <li>Vegetation clearing for lay down areas, and substation site may impact intact vegetation.</li> </ul>

Issue	Rating	Description
		<ul style="list-style-type: none"> <li>• Increased erosion risk would occur due to the loss of plant cover and soil disturbance during the construction phase.</li> <li>• Increased human presence can lead to illegal plant harvesting and other forms of disturbance such as fire.</li> </ul> <p><b>Operational Phase</b></p> <ul style="list-style-type: none"> <li>• The presence of the facility may disrupt the connectivity of the landscape for some species which may impact their ability to disperse or maintain gene flow between subpopulations.</li> <li>• The facility will require maintenance and if this is not done appropriately, it could impact adjacent intact areas through impacts such as erosion, alien plant invasion and contamination from pollutants, herbicides or pesticides.</li> </ul> <p><b>Cumulative</b></p> <p>The development would contribute to the cumulative fragmentation of the landscape and would potentially disrupt the connectivity of the landscape for fauna and flora and impair their ability to respond to environmental fluctuations.</p>
Noise	Negative	<p>In South Africa, the assessment of noise levels in the environment is governed by the South African Bureau of Standards (SABS) noise standard 0103 – ‘The measurement and rating of environmental noise with respect to annoyance and to speech communication’ (SABS 1994). Additional SABS standards cover</p>

Issue	Rating	Description
		<p>the measurement of noise over different distances from the source (SABS 0357 – ‘The calculation of sound propagation by the Concave method’), and standards for different sectors (e.g. industry).</p> <p>An increase in noise is expected to emanate from construction activities, which might have an impact especially on the surrounding farms. Noise associated with the construction activities can be mitigated by limiting the construction operation to business hours, during which noise will not be of such a big concern to surrounding residents. According to the SABS 0103 acceptable noise levels at day time is 45dBA. A noise intrusion is disturbing if it exceeds 7dBA or more. Given the nature of the project, it is highly unlikely that the stipulated noise levels will be exceeded at any given time. During the operational phase the impact of noise will also be reduced to almost insignificant levels, given the nature of the proposed project.</p> <p>Noise has been identified as potentially low due to the proposed development being in a remote area, far removed from communities. The noise impact may be local during construction and site specific during operations.</p>
Waste	Negative	<p>Naturally, the inhabitation of the land will result in the accumulation of various forms of waste in the area. The aesthetic value of the area would decrease if such waste is not collected and disposed of appropriately. Waste material will be generated during the construction phase. Such waste may accumulate from the workers campsite or from litter left around the work area by the construction staff. Other waste substances may accumulate from cement bags amongst other construction material.</p>

Issue	Rating	Description
		The impact of waste is definite and will last for the duration of the construction phase as well as the operational phase, although reduced.
Soil Erosion	Negative	Movement of heavy machinery as well as vegetation clearance may cause destabilisation of soils which then become susceptible to erosion. Continuous movement of vehicles over the land during the construction phase may leave it susceptible to erosion.
Heritage	Negative	The heritage significance of each alternative site has been assessed in terms of the National Heritage Resources Act, 1999 (No 25 of 1999). <b>(Also refer to Appendix C3 for specialist report).</b>
Surface and Groundwater Pollution	Negative	<p>The proposed alternatives are in close proximity to a number of watercourses. The impact on water quality, if any, could be sedimentation, decrease in quality and possible contamination of surface water and groundwater. This could result from fuel spillages, sewer systems, liquid waste, etc.</p> <p>An increased volume of storm water runoff, peak discharges and frequency as well as severity of flooding is therefore often characteristic of transformed catchment. The impact on water is site specific but can be local or regional if proper measures are not put in place.</p> <p>There may be a need to apply for a Water Use Licence (WUL) with DWS considering the proximity of the study area to surface water bodies.</p>
Social Environment	Negative/Positive	The construction phase may have a negative impact on the surrounding landowners if not properly managed. Social related issues may include risk of fire. Conversely, a positive impact can emanate from

Issue	Rating	Description
		the proposed development through employment of local residents. Also, a micro-economic environment could be created through vending/trade between contract workers and the locals.
Climate	Neutral	Local climate conditions do not appear to be of a significant concern to the proposed project. In a broader scale the project will have no impact on the local and/or global climate change.
Topography	Neutral	The topography of the study area is flat.
Traffic	Negative	Given the magnitude of the project amount of material and equipment will be delivered to the site during the construction phase of the development. It is therefore expected that there will be a considerable impact considering that the R51 and Stuart street forms part of the primary access to the study area.



---

## 9.2 ASSESSMENT OF THE IMPACTS PER SITE

Cumulative impacts in relation to an activity, means the past, present and reasonably foreseeable future impacts of an activity, considered together with the impacts of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities (DEA, 2014 EIA Regulations).

This section presents the assessment of impacts of the proposed project as per substation options as well as mitigation measures. Impacts for these alternatives would include:

- Impact on wetland ;
- Biodiversity (Flora and fauna); and
- Heritage

Substations alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Impact on Biodiversity</b>							
<b>Impact on vegetation and protected plant species</b>							
Vegetation clearing for the substation, pylons, servitude roads and other infrastructure would result in loss of currently intact vegetation and on plant species of conservation concern. The overall extent of the development footprint is less than 1ha and as a result, this impact would be of site consequence only and low in significance.							
Substation option 1	No	Negative	Site (1)	Long Term (4)	Low (2)	Medium (3)	<b>Low (21)</b>
	Yes	Negative	Site (1)	Long Term (4)	Minor (1)	Low (2)	<b>Low (12)</b>
Substation option 2	No	Negative	Site (1)	Long Term (4)	Low (2)	Medium (3)	<b>Low (21)</b>
	Yes	Negative	Site (1)	Long Term (4)	Low (2)	Low (2)	<b>Low (14)</b>
<b>Direct Faunal impacts</b>							
Increased levels of noise, pollution, disturbance and human presence during construction of the substation will be detrimental to fauna. Disturbance would however be transient and restricted to the construction phase and as a result would be of short duration.							
Substation option 1	No	Negative	Site (1)	Short Term (2)	Low (2)	Medium (3)	<b>Low (15)</b>
	Yes	Negative	Site (1)	Short Term (2)	Minor (1)	Low (2)	<b>Low (8)</b>
Substation option 2	No	Negative	Site (1)	Short Term (2)	Low (2)	Medium (3)	<b>Low (15)</b>
	Yes	Negative	Site (1)	Short Term (2)	Minor (1)	Low (2)	<b>Low (8)</b>
<b>Habitat destruction impact</b>							

Substations alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
The proposed project will result in the habitat loss and destruction through the site establishment. Although habitat loss would be of long-term effect, the loss of less than 1ha of habitat would be of low consequence for fauna as there are not highly localized species known from the area which makes this impact to be of low significance.							
Substation option 1	No	Negative	Site (1)	Long Term (4)	Low (2)	Medium (3)	<b>Low (21)</b>
	Yes	Negative	Site (1)	Long Term (4)	Minor (1)	Low (2)	<b>Low (12)</b>
Substation option 2	No	Negative	Site (1)	Long Term (4)	Low (2)	Medium (3)	<b>Low (21)</b>
	Yes	Negative	Site (1)	Long Term (4)	Low (2)	Low (2)	<b>Low (14)</b>
<b>Operational phase</b>							
<b>Impact on Critical Biodiversity Areas (CBA)</b>							
The proposed footprint falls within areas that have been demarcated as CBAs and the loss of habitat within the CBAs would potentially result in a loss of biodiversity as well as a potential loss in ecosystem function within the CBA, with negative consequences for biodiversity maintenance in the long-term. Given the low extent of the development footprint this impact would be of local impact only and low significance.							
Substation option 1	No	Negative	Site (1)	Long Term (4)	Minor (2)	Medium (3)	<b>Low (21)</b>
	Yes	Negative	Site (1)	Long Term (4)	Minor (2)	Low (2)	<b>Low (14)</b>
Substation option 2	No	Negative	Site (1)	Long Term (4)	Minor (2)	Medium (3)	<b>Low (21)</b>
	Yes	Negative	Site (1)	Long Term (4)	Minor (2)	Low (2)	<b>Low (14)</b>

Substations alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Mitigation Measures							
<p><b>Construction phase mitigation measures:</b></p> <ul style="list-style-type: none"> <li>Any fauna threatened by construction activities should be removed to safety by the ECO or other suitably qualified person.</li> <li>Existing roads and access routes should be used wherever possible.</li> <li>During construction all vehicles should adhere to demarcated tracks or roads and the speed limit should not exceed 40km/h on larger roads and should be 20-30km/h on smaller access tracks.</li> <li>All construction staff should undergo environmental induction before construction commences in order to raise awareness and reduce potential faunal impacts.</li> <li>To avoid impacts on amphibians, all spills of hazardous material should be cleared in the appropriate manner according to the nature and identity of the spill and all contaminated soil removed from the site.</li> <li>No fires should be allowed within the site as there is a risk of runaway veld fires.</li> <li>If any parts of site such as construction camps must be lit at night, this should be done with low-UV type lights (such as most LEDs) as far as practically possible, which do not attract insects and which should be directed downwards.</li> <li>All hazardous materials should be stored in the appropriate manner to prevent contamination of the site.</li> </ul> <p><b>Operational phase mitigation measures:</b></p> <ul style="list-style-type: none"> <li>The development footprint should be kept to a minimum and natural vegetation should be encouraged to return to disturbed areas as far as possible.</li> <li>The facility should be lit in an environmentally-friendly manner with low-UV emitting lights that do not attract insects at night.</li> </ul>							

Substations alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<ul style="list-style-type: none"> <li>The facility should not have electrified fencing on the outside fence within 30cm of the ground as this may negatively affect fauna.</li> </ul>							
<b>Surface and underground water pollution</b>							
<p>During construction there is a risk that construction material may pollute the surface and/or ground water on site. There is non-perennial river (Suikersbosrand) located approximately more than 250m from the proposed site and channelled valley-bottom wetland as well as seep wetland type This impact is of low negative significance as the watercourses are located far from the site.</p>							
Substation option 1	No	Negative	Local (2)	Long Term (4)	Low (2)	Medium (3)	<b>Low (24)</b>
	Yes	Negative	Local (2)	Long Term (4)	Low (2)	Low (2)	<b>Low (16)</b>
Substation option 2	No	Negative	Local(2)	Long Term (4)	Low (2)	Medium (3)	<b>Low (24)</b>
	Yes	Negative	Local (2)	Long Term (4)	Low (2)	Low (2)	<b>Low (16)</b>
<b>Mitigation measures of surface and underground water pollution</b>							
<ul style="list-style-type: none"> <li>Fuel must be stored in bunded areas in accordance with the legal requirements of storage of hazardous substances.</li> <li>No activities should occur within a 100m or within a 1:100 year flood line whichever is greater without approval from DWS.</li> <li>Care must be taken during construction to prevent leaks and spillage of materials that may detrimentally affect water quality (especially fuels and chemicals).</li> <li>Care must be taken to avoid destruction of water courses.</li> <li>Adequate measures must be put in place to prevent runoff of construction debris to nearby water bodies.</li> </ul>							

Substations alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Impact on agriculture</b>							
The proposed project does not impact on any active agricultural lands, therefore the impact significance of this activity on agriculture is considered low. The only active agriculture land is for hay agricultural activities situated more than 500m from the proposed site.							
Substation option 1	No	Negative	Site (1)	Short Term (2)	Minor (1)	Medium (3)	<b>Low (12)</b>
	Yes	Negative	Site (1)	Short Term (2)	Minor (1)	Low (2)	<b>Low (6)</b>
Substation option 2	No	Negative	Site (1)	Short Term (2)	Minor (1)	Medium (3)	<b>Low (12)</b>
	Yes	Negative	Site (1)	Short Term (2)	Minor (1)	Low (2)	<b>Low (6)</b>
<b>Mitigation measures for the agriculture impact</b>							
<ul style="list-style-type: none"> <li>• Approved roads must be utilised.</li> <li>• Construction activities will only be undertaken on authorised areas.</li> <li>• No waste will be buried on site</li> </ul>							
<b>Noise Pollution</b>							
An increase in noise is expected due to construction, however, the proposed site is located approximately more than 500m far from the communities and there is also an existing railway as well as road close to the site. Therefore, the significant of this impact is rated low							
Substation option 1 and 2	No	Negative	Site (1)	Long Term (4)	Minor (2)	Medium (3)	<b>Low (21)</b>
	Yes	Negative	Site (1)	Long Term (4)	Minor (2)	Low (2)	<b>Low (14)</b>

Substations alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Mitigation measures for noise pollution</b>							
<ul style="list-style-type: none"> <li>It must be ensured that all vehicles and equipment used during construction are properly maintained.</li> <li>Selecting equipment with lower sound power levels which is in accordance with the Health and Safety Regulations.</li> </ul>							

Substation alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Impact on Soil</b>							
The loss of topsoil in South Africa is a national concern and thus erosion control should be taken seriously, ineffective storm water management systems can result in soil erosion. The impact on soil is expected to be low and even lower with mitigation.							
Substation option 1	No	Negative	Site (1)	Long Term (4)	Low (2)	Medium (3)	<b>Low (21)</b>
	Yes	Negative	Site (1)	Long Term (4)	Minor (1)	Low (2)	<b>Low (12)</b>
Substation option 2	No	Negative	Site (1)	Long Term (4)	Low (2)	Medium (3)	<b>Low (21)</b>
	Yes	Negative	Site (1)	Long Term (4)	Low (2)	Low (2)	<b>Low (14)</b>
<b>Mitigation measures for soil erosion</b>							

Substation alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<ul style="list-style-type: none"> <li>• During construction, the Contractor will protect areas susceptible to erosion by installing necessary temporary and / or permanent drainage and by taking suitable measures to prevent surface water concentration into nearby roadways.</li> <li>• Prior to construction, all topsoil must be stripped and stockpiled separately from subsoil and rocky material. Soil must be stripped in a phased manner so as to retain vegetation cover for as long as possible.</li> <li>• Stockpiled topsoil must not be compacted and must be replaced as the final soil layer.</li> <li>• Stockpiled soil must be protected by erosion-control berms if exposed for a period of greater than 14 days during the wet/windy season.</li> </ul>							
<b>Fire hazards</b>							
<p>The risk of fire may be increased by onsite storage of fuel and other flammable solvents during construction. Uncontrolled fires on site could cause damage to infrastructure and the biophysical environment and impact on the social environment as well. However, the proposed site is situated on a disturbed area and with mitigation measures implemented, the significance of the impact will low</p>							
Substation option 1	No	Negative	Site (1)	Short Term (2)	Low (2)	Medium (3)	<b>Low (15)</b>
	Yes	Negative	Site (1)	Short Term (2)	Minor (1)	Low (2)	<b>Low (8)</b>
Substation option 2	No	Negative	Site (1)	Short Term (2)	Low (2)	Medium (3)	<b>Low (15)</b>
	Yes	Negative	Site (1)	Short Term (2)	Minor (1)	Low (2)	<b>Low (8)</b>
<b>Mitigation measures for fire hazards</b>							



Substation alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<ul style="list-style-type: none"> <li>The contractor must ensure that fire-fighting equipment (e.g. fire-extinguishers, fire beaters etc.) is available at all times, on site.</li> <li>Areas where flammable substances are kept must have proper warning signs on display (highly flammable, no smoking etc.) to warn personnel on site of risk associated with such areas.</li> <li>No burning of waste or cooking will be allowed on site</li> </ul>							
<b>Impact on heritage resources</b>							
The project area has considerable existing built-up areas and as such no significant impacts are anticipated on the built environment given the existence of contemporary built-infrastructure or structures already in the project area. Impacts to heritage resources are not considered to be adverse to warrant abandonment of the proposed project.							
Substation option 1	No	Negative	Site (1)	Long Term (4)	Minor (2)	Medium (3)	<b>Low (21)</b>
	Yes	Negative	Site (1)	Long Term (4)	Minor (2)	Low (2)	<b>Low (14)</b>
Substation option 2	No	Negative	Site (1)	Long Term (4)	Minor (2)	Medium (3)	<b>Low (21)</b>
	Yes	Negative	Site (1)	Long Term (4)	Minor (2)	Low (2)	<b>Low (14)</b>
<b>Mitigation measures for heritage resources</b>							

Substation alternatives	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<ul style="list-style-type: none"> <li>• The footprint impact of the proposed development should be kept minimal to limit the possibility of encountering chance finds.</li> <li>• There are no burial sites or graves identified, however, should graves and burial sites be discovered during construction activities, all activities should cease and the site must be barricaded. Further, SAHRA / MPHRA or a professional archaeologist must be informed.</li> <li>• Should any unmarked burials exposed during construction, affected families must be trekked and consulted, relevant rescue / relocation permits must be obtained from SAHRA/MPHRA before any grave relocation can take place. Furthermore, a professional archaeologist must be retained to oversee the relocation process in accordance with the National Heritage Resources Act, 1999 ( ) 25 of 1999;</li> <li>• Should archaeological materials or human burials remains be exposed during construction, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately.</li> </ul>							

### 9.3 GENERAL CUMULATIVE IMPACTS

This section provides cumulative impacts ratings associated with the proposed project which include the waste generation, traffic, socio-economic and visual impacts. It also outlines the mitigation measures of each rated cumulative impacts as follows:

#### 9.3.1.1 Critical Biodiversity Areas

Aspect	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Waste	No	Negative	Site (1)	Long Term (4)	Minor (2)	Medium (3)	Low (21)
	Yes	Negative	Site (1)	Long Term (4)	Minor (2)	Low (2)	Low (14)
Corrective Actions	<ul style="list-style-type: none"> <li>The development footprint should be kept to a minimum and natural vegetation should be encouraged to return to disturbed areas as far as possible.</li> <li>The facility should be lit in an environmentally-friendly manner with low-uv emitting lights that do not attract insects at night.</li> <li>The facility should not have electrified fencing on the outside fence within 30cm of the ground as this may negatively affect fauna.</li> </ul>						

#### 9.3.1.2 Waste generation

During the construction phase of the proposed substation there will be a variety of waste material produced within the study area. The waste generation impact rating and the proposed mitigation measures are provided in table below as follows:

Aspect	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Waste	No	Negative	2	2	8	5	60=Medium
	Yes	Negative	1	2	4	4	28=Low
Corrective Actions	<ul style="list-style-type: none"> <li>No waste will be buried on site or incorporated into the foundation trenches;</li> <li>The work force must be encouraged to sort waste into recyclable and non-recyclable waste;</li> <li>No burning of waste will be allowed on site; and</li> <li>Waste must be regularly removed from site and disposed of at a registered waste disposal facility.</li> </ul>						

### 9.3.1.3 Socio-economic impact

The proposed development will result in a positive socio-economic impact as the demand for equipment, building material and labour will increase. Secondary service provision such as food supply, toilet hire, equipment maintenance and many more items would also stimulate the local economy especially during the construction phase. The impacts of socio-economic impacts associated with the proposed development are rated as follows:

Aspect	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Socio-economic	No	Positive	3	2	8	5	65=Medium
Corrective Actions	<ul style="list-style-type: none"> <li>Contractors must by all means practice the localisation matrix while seeking for construction equipment or building materials.</li> <li>For minimal jobs, the appointed contractor should by all means consider the local residents for jobs that do not need any skill transfer.</li> </ul>						

- Property owner must be treated with respect and courtesy at all times;
- The culture and lifestyles of the communities living in close proximity to the proposed development must be respected;
- No firewood is to be collected except with the written consent of the landowner; and
- A register must be maintained of all complaints or queries received as well as action taken.

#### 9.3.1.4 Visual Impact

The proposed activity will change the visual character of the area particularly considering that the proposed site is located next to Stuart Street connected from provincial R51 road. Given the undulating topography of the site and the proximity to these routes, the impact can be considered definite and long term. Cumulative impact will be higher than anticipated due to existing power lines and switching substation. The visual cumulative impacts and mitigation measures within the proposed study area are provided as follows:

Aspect	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Visual	No	Negative	2	4	8	5	70=High
	Yes	Negative	2	4	6	3	36=Medium
Corrective Actions	<ul style="list-style-type: none"> <li>• Keep the construction sites and camps neat, clean and organized in order to portray a tidy appearance; and</li> <li>• Screen the construction camp and lay-down yards by enclosing the entire area with a dark green or black shade cloth of no less than 2m height.</li> </ul>						

### 9.3.1.5 Traffic Impact

During the construction phase, increased heavy vehicle traffic should be expected. Without management, such increased traffic loads may negatively impact existing traffic flow. Further unmanaged construction vehicles may decrease road safety for other road users and uncontrolled movement of construction vehicles may result in unnecessary impacts to the environment through vegetation and habitat destruction. The traffic impacts ratings and mitigation measures associated with the proposed project presented in the table below as follows.

Aspect	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Traffic	No	Negative	3	2	8	3	39 = Medium
	Yes	Negative	2	2	6	2	20 = Low
Corrective actions	<ul style="list-style-type: none"> <li>The delivery of construction material and equipment should be limited to hours outside peak traffic times (including weekends) prevailing on the surrounding roads;</li> <li>Access roads must be clearly marked; and</li> <li>Delivery vehicles must comply with all traffic laws and bylaws.</li> </ul>						

## 9.4 METHODOLOGY FOR ASSESSING SIGNIFICANCE OF POTENTIAL IMPACTS

The assessment of impacts is largely based on the Department of Environmental Affairs and Tourism's (1998) Guideline Document: Environmental Impact Assessment Regulations. The assessment will consider impacts arising from the proposed activities of the project both before and after the implementation of appropriate mitigation measures.

The impacts are assessed according to the criteria outlined in this section. Each issue is ranked according to extent, duration, magnitude (intensity) and probability. From these criteria, a significance rating is obtained, the method and formula is described below. Where possible, mitigation recommendations have been made and are presented in tabular form.

The criteria given in the tables below will be used to conduct the evaluation. The nature of each impact will be assessed and described in relation to the extent, duration, intensity, significance and probability of occurrence attached to it.

**Table 10:** Methodology used in determining the significance of potential environmental impacts

<p><b>Status of Impact</b></p> <p>The impacts are assessed as either having a: negative effect (i.e. at a 'cost' to the environment), positive effect (i.e. a 'benefit' to the environment), or Neutral effect on the environment.</p> <p><b>Extent of the Impact</b></p> <p>(1) Site (site only), (2) Local (site boundary and immediate surrounds), (3) Regional (4) National, or (5) International.</p> <p><b>Duration of the Impact</b></p> <p>The length that the impact will last for is described as either: (1) immediate (&lt;1 year) (2) short term (1-5 years), (3) medium term (5-15 years),</p>
--

- (4) long term (ceases after the operational life span of the project),
- (5) Permanent.

### **Magnitude of the Impact**

The intensity or severity of the impacts is indicated as either:

- (0) none,
- (2) Minor,
- (4) Low,
- (6) Moderate (environmental functions altered but continue),
- (8) High (environmental functions temporarily cease), or
- (10) Very high / Unsure (environmental functions permanently cease).

### **Probability of Occurrence**

The likelihood of the impact actually occurring is indicated as either:

- (0) None (the impact will not occur),
- (1) improbable (probability very low due to design or experience)
- (2) low probability (unlikely to occur),
- (3) medium probability (distinct probability that the impact will occur),
- (4) high probability (most likely to occur), or
- (5) Definite.

### **Significance of the Impact**

Based on the information contained in the points above, the potential impacts are assigned a significance rating (**S**). This rating is formulated by adding the sum of the numbers assigned to extent (**E**), duration (**D**) and magnitude (**M**) and multiplying this sum by the probability (**P**) of the impact.

$$S=(E+D+M)P$$

### **The significance ratings are given below**

- (<30) low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- (30-60) medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- (>60) high (i.e. where the impact must have an influence on the decision process to develop in the area).

## **10. AN UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP**

In undertaking the draft BAR, the EAP took into consideration the requirements stipulated in the EIA Regulation of December 2014 (as amended in April 2017), as well as other relevant Acts and regulations. This will also apply in undertaking the final BAR phases. The EAP hereby confirms that with the information available at the time of preparing this report, the following has been taken into account:



- The correctness of the information provided in this BAR;
- The inclusion of comments and inputs from stakeholders and interested and affected parties (I&APs); and
- Any information provided by the EAP to the I&APs and any responses by the EAP to comments or inputs made by I&APs.

Refer to **Appendix E2** for the declaration of the EAP

## 11. ENVIRONMENTAL IMPACT STATEMENT

Both positive and negative environmental impacts (ranging from habitat loss to operational effects) were identified and assessed for the proposed development. From the heritage perspective, the identified impacts are considered to be **low to medium** in significance without mitigation which can be reduced to **low** by implementing the proposed mitigation measures.

The biodiversity specialist indicated that the construction of the proposed project will result in various impacts of **low** significance to the flora and fauna occurring in the vicinity of the new infrastructure, which can be reduced to **negligible** levels through the application of mitigation measures. Given the presence of existing habitat degradation in places and fairly significant levels of disturbance, it is anticipated that the proposed project can be constructed within the project area with acceptable levels of impact. Based on the findings of the specialists and the Impact Assessment undertaken by the EAP, **Option 1** is preferred and recommended.

## 12. SUMMARY OF IMPACT MANAGEMENT MEASURES IDENTIFIED FROM SPECIALISTS REPORTS

Three specialist studies (wetland, biodiversity and heritage) were identified and recommended for this project and they indicated in Table below. The table entails the mitigation measures and recommendation proposed by the specialist.

**Table 11: Summary of the impact management measures from specialist**

Proposed mitigation measures and recommendations by specialists		
Biodiversity	Heritage	Wetland
<ul style="list-style-type: none"> <li>• There should be a preconstruction walk-through of the substation footprint area to identify species of conservation concern that should be avoided or translocated.</li> <li>• Existing roads and access routes should be used wherever possible.</li> <li>• Ensure that lay-down and other temporary infrastructure is within low sensitivity areas, preferably previously transformed areas if possible.</li> <li>• Minimise the development footprint as far as possible and rehabilitate disturbed areas that are no longer required by the operational phase of the development.</li> <li>• Demarcate all areas to be cleared with construction tape or other appropriate and effective means. However, caution should be exercised to avoid using material that might entangle fauna.</li> </ul>	<ul style="list-style-type: none"> <li>• The footprint impact of the proposed development should be kept minimal to limit the possibility of encountering chance finds.</li> <li>• There are no burial sites or graves identified, however, should graves and burial sites be discovered during construction activities, all activities should cease and the site must be barricaded. Further, SAHRA / MPHRA or a professional archaeologist must be informed.</li> <li>• Should any unmarked burials exposed during construction, affected families must be trekked and consulted, relevant rescue / relocation permits must be obtained from SAHRA/MPHRA before any grave relocation can take place. Furthermore, a professional archaeologist must be retained to oversee the relocation process in accordance with the National Heritage Resources Act, 1999 ( ) 25 of 1999;</li> </ul>	<ul style="list-style-type: none"> <li>• The proposed project must take all wetlands and watercourses into consideration and these systems must be avoided.</li> <li>• The development footprint is to be limited to what is absolutely essential in order to minimise environmental damage.</li> <li>• No stockpiling of any materials may take place adjacent to any of the water resources.</li> <li>• Erosion control measures must be implemented in areas sensitive to erosion, particularly in areas prone to erosion and where erosion has already occurred.</li> <li>• Do not allow surface water or stormwater to be concentrated, or to flow down slopes without erosion protection measures being in place.</li> <li>• All disturbed areas must be rehabilitated as soon as construction in an area is complete or</li> </ul>

	<ul style="list-style-type: none"> <li>Should archaeological materials or human burials remains be exposed during construction, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately.</li> </ul>	<p>near complete and not left until the end of the project to be rehabilitated.</p> <ul style="list-style-type: none"> <li>Make use of existing access roads as much as possible and plan additional access routes to avoid vegetation communities.</li> <li>Minimise the extent of the work footprint as far as possible.</li> </ul>
--	---	---

---

### 13. CONCLUSION AND RECOMMENDATIONS

The Basic Assessment study was undertaken as dictated by the NEMA and the associated EIA Regulations of December 2014 as amended. The site alternatives have been proposed and the primary objective was to assess the suitability of each substation options for the intended use as well as to assess the impacts of the proposed project (i.e. substation). This report has comprehensively addressed the baseline environment which forms the backdrop of the impact assessment. Information provided in this report has been supported by the specialist studies that were undertaken and attached hereto.

---

## 14. REFERENCES

<http://weatherhq.co.za//swellendam>

DEAT, 1998. A National Strategy for Integrated Environmental Management in South Africa. Compiled by Environomics

DEAT, 1998 Guideline Document: Environmental Impact Assessment Regulations

Harrison, J.A., Allan, D.G., Underhill, L.G., Herremans, M., Tree, A.J., Parker, V & Brown, C.J. (eds). 1997. The atlas of southern African birds. Vol. 1&2. Bird Life South Africa: Johannesburg.

Mucina, L. & Rutherford, M.C. (2006): The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.

Raimondo, D., von Staden, L., Foden, W., Victor, J.E., Helme, N.A., Turner, R.C., Kamundi, D.A. & Manyama P.A., (eds) (2009): Red List of South African plants 2009. *Strelitzia* 25, South African National Biodiversity Institute.