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Eskom Holdings SOC Limited

ERMELO-RICHARDS BAY COAL LINE UPGRADE PROJECT: PROPOSED DEVELOPMENT OF THE SHEEPMOOR TRACTION STATION AND TWO NEW ASSOCIATED 88 KV TURN IN LINES WITH 20MVA TRANSFORMER BAYS, MPUMALANGA PROVINCE, SOUTH AFRICA

Final Basic Assessment Report

DEA Reference Number: 14/12/16/3/3/2/1102

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BASIC ASSESSMENT REPORT

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Document title:	FINAL BAR: PROPOSED DEVELOPMENT OF THE SHEEPMOOR TRACTION STATION AND TWO NEW ASSOCIATED 88/25KV TURN IN LINES WITH 20MVA TRANSFORMER BAYS, MPUMALANGA PROVINCE, SOUTH AFRICA
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EXECUTIVE SUMMARY OF THE CONTENT OF THE BASIC ASSESSMENT REPORT

INTRODUCTION AND PROJECT DESCRIPTION:

The Applicant, Eskom Holdings (SOC) Ltd. is making an Application for Environmental Authorisation for the development of a new 88/25kV traction substation with two 20MVA transformer bays at the Sheepmoor Traction Substation, Mpumalanga, in terms of the National Environmental Management Act, Act No. 107 of 1998 (as amended). The Substation will be fed from two new 88kV lines and will feed the existing 25kV traction line. This Application for Environmental Authorisation is being made to the Competent Authority, namely, the National Department of Environmental Affairs (DEA). The proposed development requires compliance with the Environmental Impact Assessment (EIA) Regulations of 2010 (as amended), promulgated in terms of the National Environmental Management Act (No. 107 of 1998) (NEMA).

SiVEST Environmental has been appointed by Eskom Holdings (SOC) Ltd (herein after referred to as the Applicant) to undertake a Basic Assessment Process for the above-mentioned project.

Background

The proposed Sheepmoor TSS and associated power lines are part of a suite of projects collectively known as the Ermelo-Richards Bay Coal Link Upgrade.

Transnet is South Africa's sole provider of rail transport infrastructure for coal transportation. One of South Africa's largest foreign exchange earners is the export of high quality coal products to China. The Transnet rail link between the coal fields in Mpumalanga Province and the export node, the Richards' Bay Coal Terminal, is one of the busiest railway links in South Africa.

The increase in demand for South Africa's high quality coal necessitates the increase in production, which in turn has demands on the railway network infrastructure. In response to the increased demand for South Africa's coal in the global market place, Transnet needs to increase the volume of coal that is being transported between the Mpumalanga coal fields and the Richards' Bay Coal Terminal. This increase will be facilitated through capital expenditure on two fronts, the supporting infrastructure, i.e. the electrical network supplying the locomotives and the locomotives themselves.

In order for Transnet to accomplish the above they need to upgrade their power supply to their various traction substations between Ermelo and Richards Bay to facilitate the introduction of the new, larger locomotives that will be added to increase the volume of coal being transported and exported. Eskom Holdings (SOC) Ltd being one of the main suppliers of electrical energy in South Africa has been tasked by Transnet to supply the additional energy requirements to these traction substations. In trying to meet the task Eskom Holdings (SOC) Ltd requires environmental authorisation from the Department of Environmental Affairs (DEA) to establish new substations and power lines.

Proposed Development

The proposed development is situated in Southern Mpumalanga, approximately 40 kilometres South East of the town of Ermelo. The site falls within Msukaligwa Local Municipality. The proposed project entails the construction of a new 88/25kV traction substation with two 20MVA transformer bays at the Sheepmoor Traction Substation (TSS). The Substation will be fed from two new 88kV lines and will feed the existing 25kV traction line. The proposed traction substation site is located in the north-eastern sector of the town of Sheepmoor, 50m south of the Ermelo-Richards Bay railway line. The proposed 25kV power lines will be of 100m length and connect from the proposed traction substation to the existing 25kV railway power line.

Power line:

For all power line alignment options, the structure is proposed to be a monopole structure. The monopole tower type will have approximately a minimum height of 16m and a maximum height of 26m. This tower type is consistent with the existing tower types in the area and in addition Eskom has the necessary tools, skills, vehicles and resources to maintain this type of structure in this area.

One line will run to the North and the other will run to the South. The Northern Circuit involves the establishment of a new 88kV power line from Sheepmoor to the existing 88kV line. The Southern Circuit involves the establishment of a new 88kV power line from Sheepmoor to the existing 88kV line. For both the proposed new Northern and Southern power lines, the structure is proposed to be a monopole structure and will cross agricultural and forestry land. All 88kV power lines will be constructed with 132kV capacity but operated at 88kV at inception, in order to cater for future capacity increases.

Seven (7) alternative options were assessed for the two proposed 88kV power lines that run from Sheepmoor TSS to the existing 88kV power line:

- Option 1 – Contain the two 88kV power lines within route Alternative 1 (light green) – approximately 11km;
- Option 2 – Contain the two 88kV power lines within route Alternative 2a (blue) – approximately 8km;
- Option 3 – Contain the two 88kV power lines within route Alternative 2b (orange) – approximately 5.5km;
- Option 4 – Contain the two 88kV power lines within route Alternative 2c (dark green) – approximately 8km;
- Option 5 – Contain one 88kV power line within route Alternative 1 and one 88kV power line within route Alternative 2a;
- Option 6 – Contain one 88kV power line within route Alternative 1 and one 88kV power line within route Alternative 2b; and
- Option 7 – Contain one 88kV power line within route Alternative 1 and one 88kV power line within route Alternative 2c.

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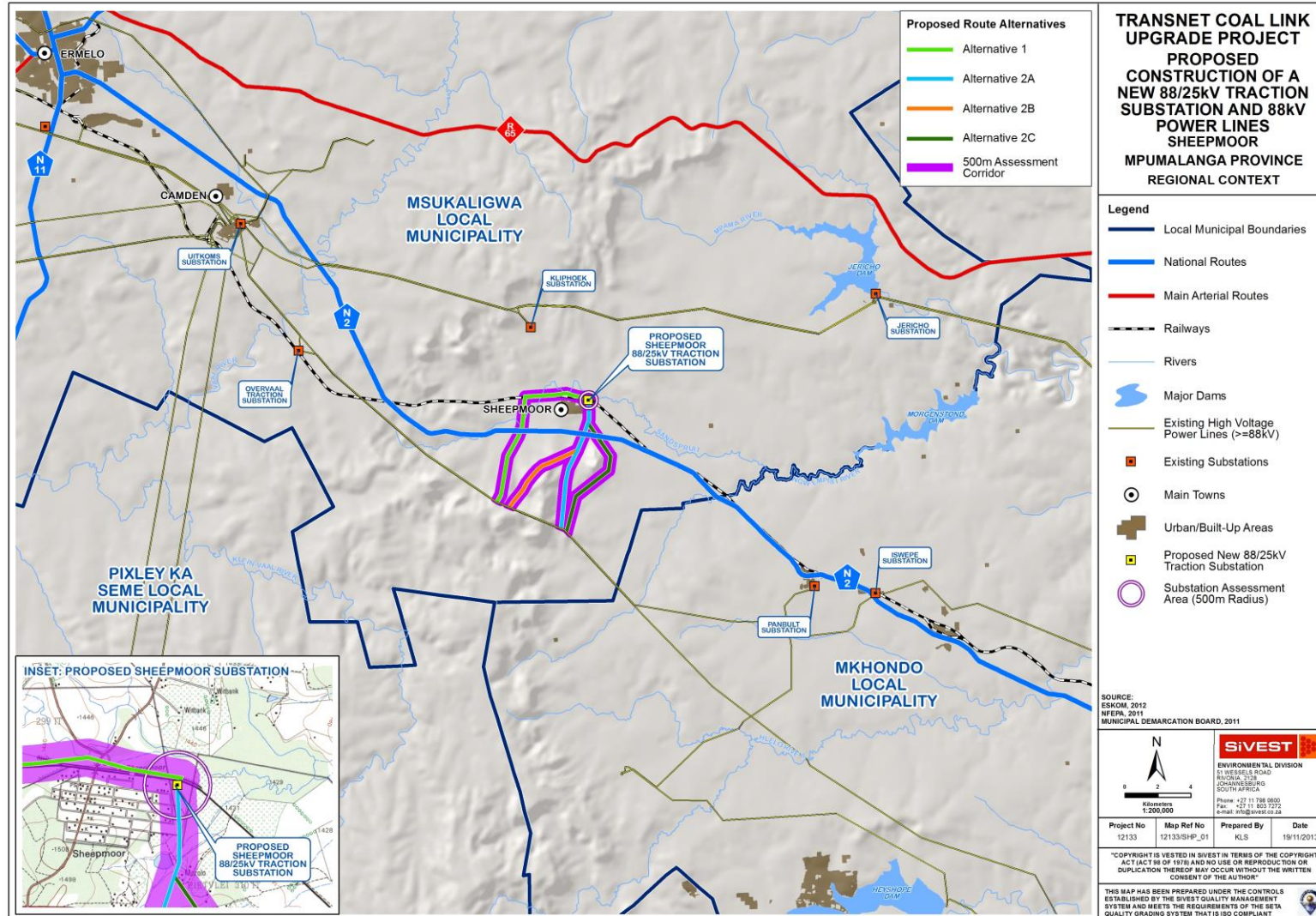


Figure 1: Site Locality Map

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The power lines will consist of a series of towers located approximately 200m apart, depending on the terrain and soil conditions. It is proposed that a monopole tower type with a minimum height of 16m and a maximum height of 26m will be used, however the exact tower type will be determined (based on load and other calculations) during the final design stages of the power lines.

Proposed access roads to the substation and along the length of the proposed 88kV power lines will utilise the existing road network. The line corridor width is 500m. Within this 500m corridor a 32m wide servitude will be required for the 88kV power lines. Access to the substation site is to comprise a single-lane, 200m long gravel access road turning off north from the existing gravel road that leads to the Ermelo-Richards Bay railway line 50m north of the proposed traction substation.

For the proposed Sheepmoor TSS a radius of 0.5km from the centre point of the proposed site must be assessed as the orientation of the Substation (SS) is unknown at this stage and as such the positioning of all incoming and outgoing lines and access roads remains to be determined.

The location given for the proposed Sheepmoor TSS is the only locations acceptable to Transnet as it has been determined that they are:

- 1) The optimal positions between the existing substations that will provide the overhead traction supply voltage and current profiles that will meet Transnet's requirements;
- 2) The only positions that meet the requirements of 1) plus there is sufficient space within Transnet's existing rail reserve for building the substation and does not require the procurement of additional land by Transnet; and
- 3) The only positions that meet the requirements of 1) and 2) and are also closest to a track gradient suitable for the positioning of an overhead track equipment neutral section (or phase break). The requirement being that electric locomotives be automatically switched off before entering the neutral section and have sufficient momentum to coast through the neutral section without electrical power and then be automatically switched on again after the neutral section. This is necessary as either side of the neutral section is fed on different electrical phases.

The minimum size (footprint) of the proposed Sheepmoor Traction Substation site is approximately 2.0ha, which needs to accommodate:

- Two (2) 88 kV Distribution power line bays;
- Two (2) 88/25 kV transformer bays;
- Two (2) 25kV line bays;
- Stormwater drainage systems;
- Earth mat underlying the proposed substation at approx. 1m depth to ensure earthing/grounding of the substation;
- Associated control room buildings housing support services infrastructure;
- Storm water infrastructure; and
- All 88kV infrastructure will be constructed at 132kV.

At the location of proposed substation sites, earth mats (grounds mats) will be installed underground to provide a uniform potential gradient over the substation site.

APPLICABILITY OF NEMA EIA REGULATIONS (2010):

The proposed development requires compliance with the Environmental Impact Assessment (EIA) Regulations of 2010 (as amended), promulgated in terms of the National Environmental Management Act, Act 107 of 1998, as amended, as the BA was initiated prior to the EIA 2014 Regulations coming

into effect. The proposed activity requires a Basic Assessment Process be undertaken as listed **Activities 10(i), 11(xi) and 18(i)** under **Government Notice No R. 544** as well as listed **Activities 4(a)ii.(cc)(ee), 12(b), 13(a)(c)i.(cc), 14(a)(i) and 16(iv)(a)ii.(dd)(ff)** of **Government Notice No R. 546** of the EIA 2010 Regulations are triggered.

RECEIVING ENVIRONMENT:

The proposed new Sheepmoor Traction Substation (TSS) and power lines are situated in Southern Mpumalanga, approximately 40 kilometres South East of the town of Ermelo.

The proposed power lines would run in a South-easterly direction from the proposed Sheepmoor TSS to the existing 88kV power line with a total approximate length of 11 km. The power line would run through vacant natural land and between Eucalyptus plantations and spans across the Sandspruit River.

The alternative route (Route1) runs in a north-easterly direction alongside the Ermelo-Richards Bay railway line for approximately 4km before branching off into a South-easterly direction for approximately 7 km, towards the existing 88kV Uitkoms-Iswepe power line between eucalyptus plantations and the natural land.

The alternative route (Route 2a) runs in a south-easterly direction from the proposed Sheepmoor Traction Substation for approximately 8km along vacant land and connects to the existing 88kV Uitkoms-Iswepe power line.

The alternative route (Route 2b) runs in a south-easterly direction following the same route as alternative 2a from the proposed Sheepmoor Traction Substation for approximately 3km before it branches off into a south-westerly direction for 5.5km across vacant land and connects to the existing 88kV Uitkoms-Iswepe power line.

The alternative route (Route 2c) runs in a south-easterly direction following the same route as alternative 2a from the proposed Sheepmoor Traction Substation for approximately 1.5km before it branches off into an easterly direction for 2.5 km until it bends into a south-westerly direction for 5.5km until it connects to the existing 88kV Uitkoms-Iswepe power line.

The surrounding areas of the proposed Substation site is characterised by natural undeveloped land that is mainly used as grazing land for cattle and numerous water bodies are dispersed throughout the study area. Isolated patches of commercial cultivation practices occur in areas to the north and east of the power line alternatives and dense commercial forestry plantations occur directly south of Sheepmoor and in the south eastern and north eastern parts of the study area. The only built-up area in the study area is the rural small village of Sheepmoor, which is located directly south west of the proposed site for the Sheepmoor Traction Substation. Other built forms in the study area are limited to scattered farmsteads, power lines and telecommunication towers, the N2 road and a railway line that runs in a west east alignment through the study area as well as a network of local and farming access roads.

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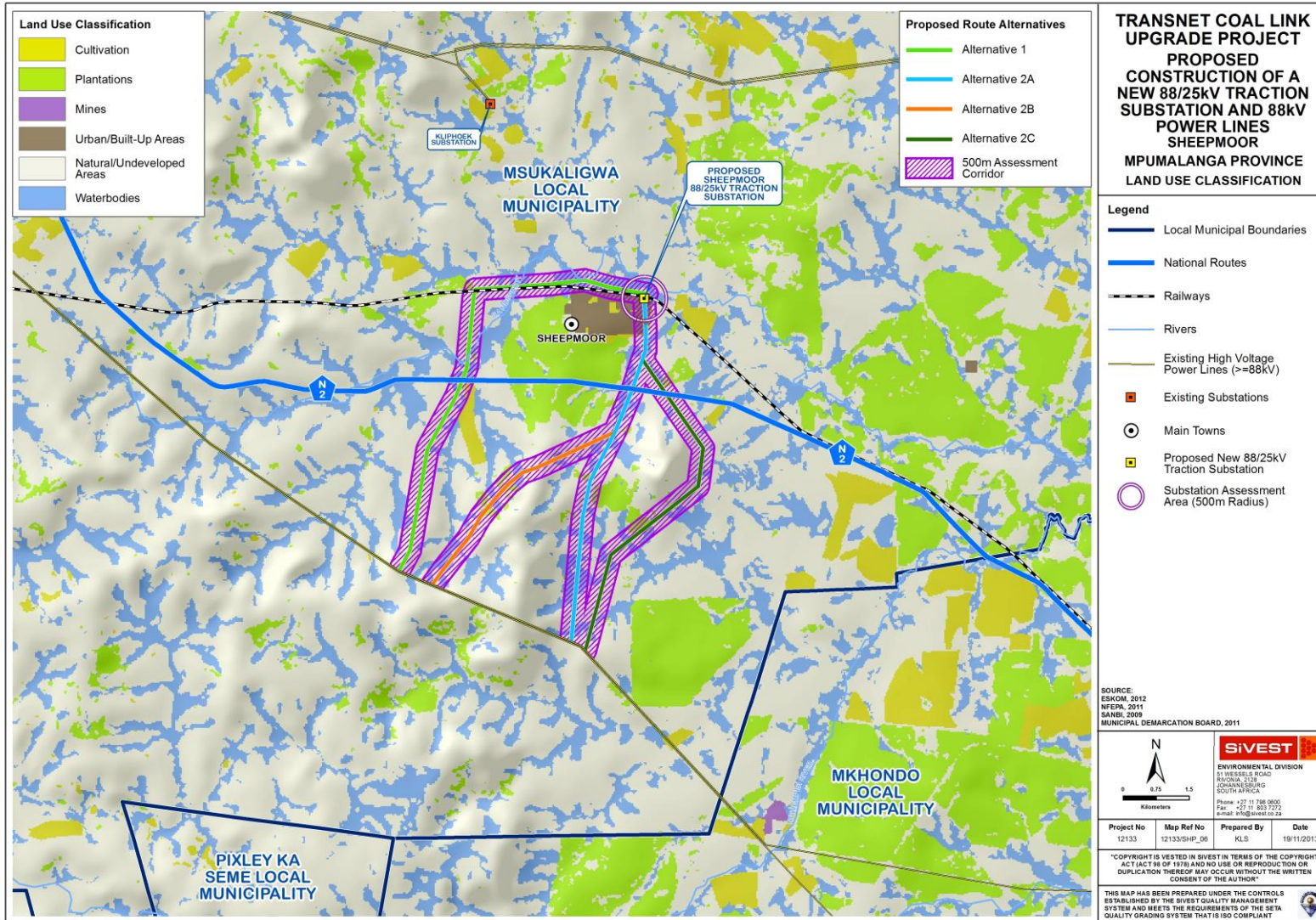


Figure 2: Land Use

ALTERNATIVES:

Alternatives are defined in the NEMA EIA Regulations (2010) as “different means of meeting the general purpose and requirements of the activity, which may include alternatives to: (a) the property on which or location where it is proposed to undertake the activity; (b) the type of activity to be undertaken; (c) the design or layout of the activity; (d) the technology to be used in the activity; and (e) the operational aspects of the activity and (f) the option of not implementing the activity”.

For the purpose of this Application, the following Alternatives were investigated:

Route Alternatives:

Seven (7) alternative options were assessed for the two proposed 88kV power lines that run from Sheepmoor TSS to the existing 88kV power line. These are as follows:

- Option 1 – Contain the two 88kV power lines within route Alternative 1 (light green) – approximately 11km
- Option 2 – Contain the two 88kV power lines within route Alternative 2a (blue) – approximately 8km
- Option 3 – Contain the two 88kV power lines within route Alternative 2b (orange) – approximately 5.5km
- Option 4 – Contain the two 88kV power lines within route Alternative 2c (dark green) – approximately 8km
- Option 5 – Contain one 88kV power line within route Alternative 1 and one 88kV power line within route Alternative 2a
- Option 6 – Contain one 88kV power line within route Alternative 1 and one 88kV power line within route Alternative 2b
- Option 7 – Contain one 88kV power line within route Alternative 1 and one 88kV power line within route Alternative 2c

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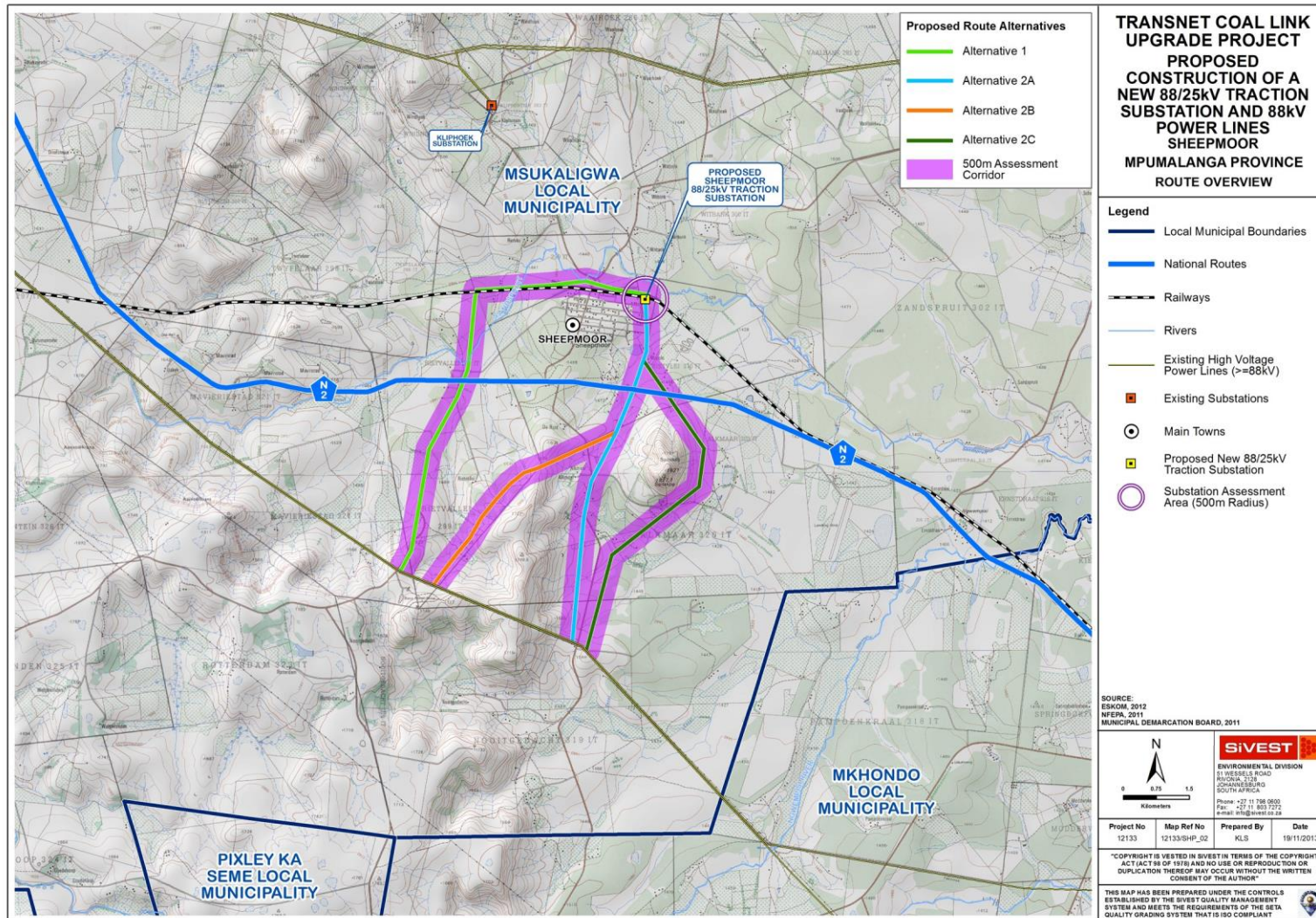


Figure 3: Route overview Map

Technological Alternatives:

None

No-Go Alternative:

The No-Go Alternative refers to the option of not implementing the proposed infrastructure development and ultimately the continuation of the current *status quo*. In order for Transnet to achieve the increased demand for coal and the associated mining activities they need to upgrade their power supply to their various traction substations between Ermelo and Richards Bay. This will facilitate the introduction of the new, larger locomotives that will be added to increase the volume of coal being transported and exported. Should this development not go forward then the electricity demands will not be met and this may affect the mining activities in the area.

Power line Option 5 (Containing one 88kV power line within route Alternative 1 and one 88kV power line within route Alternative 2a) has been identified as the preferred alternative as it is both technically feasible and traverses land which is less environmentally sensitive. It will result in the least environmental impact.

PUBLIC PARTICIPATION

A public participation process was undertaken in accordance with the NEMA EIA 2010 Regulations, as the BA was initiated prior to the EIA 2014 Regulations coming into effect, and in terms of the Department of Environmental Affairs Companion to the EIA Regulations 2010, Integrated Environmental Management Guideline Series 5, October 2012.

Initial and Draft BAR Notification

Interested and Affected Parties (I&AP's) were identified and provided with an opportunity to register their interest in the application process. The Draft Basic Assessment Report was submitted for review and comment to any interested and affected parties.

The following parties were notified of the Basic Assessment Process and the availability of the Background Information Document (BID), Draft Basic Assessment Report (DBAR) and Environmental Management Programme (EMPr) for review and comment:

- Department of Environmental Affairs
- Department of Water and Sanitation
- Department of Agriculture, Forestry and Fisheries
- Gert Sibande District Municipality
- Msukaligwa Local Municipality
- NGO and Ratepayers Association of the Area
- Adjacent landowners
- Ward Councillor of the area

In addition to this, newspaper advertisements were published between the 23rd March 2015 – 3rd April 2015 in the Sowetan Newspaper, Ermelo Tribune, Zululand Observer and the Paulpietersburg Advertiser. Due to the high likelihood of overlapping stakeholders, all 8 Ermelo-Richards Bay Coal Link Upgrade projects are being advertised together.

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Additionally, site notices were placed on the site (along route alternatives and at the substation sites); and the BID, Draft BAR and Draft EMPr were delivered to:

- Msukaligwa Municipality Public Library, Ermelo, Corner of Smuts and Kerk Streets, Ermelo [tel: 017 801 3621]

The documents were also made available on SiVEST's website (www.sivest.co.za) for review and comment. Stakeholders were given the opportunity to review and comment on the Draft BAR for a period of **40 days (26th March 2015 – 8th May 2015)**. All comments received or responses sent during the public comment period for the Draft BAR are recorded in a Comments and Responses Report (to be included in Appendix E3 of the FBAR)

ENVIRONMENTAL IMPACT STATEMENT

The impact statement for the Substation Alternative and power line alternatives are listed below. Due to the homogenous nature of the area traversed by the various alternatives, the substation and all power line alternatives were assessed together. The impact statements for the alternative route and substation site can be found in Appendix F (Impact Assessment Report) of this report along with a comparative assessment of the preferred and alternative routes and substation sites.

The impacts rated for the CONSTRUCTION PHASE:

Impact rating summary for all the power line and substation alternatives during the construction phase.

Type of Impact	Description	Status	Significance Rating Pre-Mitigation	Status after mitigation
Botanical	Disturbance to degraded Vulnerable Eastern Highveld Grassland and Vulnerable Eastern Temperate Freshwater Wetlands.	Negative	Low (Substation Alternatives)	Low (Substation Alternatives)
Botanical	Disturbance to and loss of Vulnerable Eastern Highveld Grassland, Endangered Wakkerstroom Montane Grassland and Vulnerable Eastern Temperate Freshwater Wetlands. This corridor is largely covered by Eastern Highveld Grassland.	Negative	Medium (Power Line Alternative 1)	Low (Power Line Alternative 1)
Botanical	Disturbance to and loss of Eastern Highveld Grassland and Wakkerstroom Montane Grassland, both of which are well represented in this corridor. Disturbance to and loss of Vulnerable Eastern Temperate Freshwater Wetlands.	Negative	High (Power Line Alternative 2B)	High (Power Line Alternative 2B)
Botanical	Disturbance to and loss of Vulnerable Eastern Highveld Grassland, Endangered Wakkerstroom Montane Grassland and Vulnerable Eastern Temperate Freshwater Wetlands. This corridor is largely covered by Eastern Highveld Grassland	Negative	Medium (Power Line Alternative 2A)	Low (Power Line Alternative 2A)
Botanical	Disturbance to and loss of Vulnerable Eastern Highveld Grassland, Endangered Wakkerstroom Montane Grassland and Vulnerable Eastern	Negative	Medium (Power Line Alternative 2C)	Low (Power Line Alternative 2C)

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Type of Impact	Description	Status	Significance Rating Pre-Mitigation	Status after mitigation
	Temperate Freshwater Wetlands. This corridor is largely covered by Eastern Highveld Grassland.			
Floral Habitat	Loss of floral habitat including sensitive habitat types, fragmentation of habitat.	Negative	Medium	Low
Floral Habitat	Loss of floral diversity, increase in alien and invasive floral species	Negative	Medium	Low
Floral Habitat	Loss of floral SCC and RDL species	Negative	Medium	Low
Fauna	Vegetation clearing, disturbance and the use of heavy machinery and human presence along the power line route and at substation locations during construction is likely to negatively affect resident fauna directly and through habitat loss.	Negative	Medium	Low
Surface Water	Pre-Construction Lay-down area potential impacts: drainage lines and watercourse riparian habitat degradation	Negative	Medium	Low
Surface Water	Degradation and removal of wetland and riparian habitat soils and vegetation	Negative	High	Low
Surface Water	Vehicle and Machinery Impacts: drainage lines and watercourse compaction/degradation	Negative	Medium	Low
Surface Water	Human degradation impacts: surface water resource fauna and flora physical degradation	Negative	Medium	Low
Surface Water	Erosion, increased run-off and sedimentation impacts	Negative	Low	Low
Surface Water	Degradation Impacts: stringing of power lines through surface water resources	Negative	Low	Low
Physical and Geographical	Soil erosion through vegetation clearance and soil compaction by heavy duty construction vehicles.	Negative	Low	Low
Physical and Geographical	Contamination of soils through indiscriminate disposal of construction waste and accidental spillage of petroleum products.	Negative	Low	Low
Soil and Agriculture	Loss of agricultural land and / or production as a result of the proposed substation construction	Negative	Medium (Power Line Alternatives)	Low (Power Line Alternatives)
			Medium (Substation Alternative)	Low (Substation Alternative)
Avifauna	Disturbance of birds during construction of project	Negative	Low	Low
			Medium- (in areas close to wetlands)	
Avifauna	Destruction and alteration of habitat available to birds and the area during construction of the proposed project	Negative	Medium - High	Low
Visual	Large construction vehicles and equipment during the construction phase may change the visual character of the study area and	Negative	Low	Low

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Type of Impact	Description	Status	Significance Rating Pre-Mitigation	Status after mitigation
	expose sensitive receptors to visual impacts associated with the construction phase.			
Heritage	Two cemeteries and one Later Iron Age site occurs on the footprint	Negative	High	None
Dust	Dust impacts on surrounding environment associated with construction activities.	Negative	Low	Low
Noise	Noise impacts on surrounding environment associated with construction activities.	Negative	Low	Low
Waste	Generating of additional waste / Litter and building rubble or hazardous material during the construction phase.	Negative	Medium	Low

The impacts rated for the OPERATIONAL PHASE

Impact rating summary for the proposed power line and substation alternatives during the operational phase.

Type of Impact	Description	Status	Significance Rating Pre-Mitigation	Status after mitigation
Floral Habitat	Loss of floral habitat including sensitive habitat types, fragmentation of habitat.	Negative	Low	Low
Floral Habitat	Loss of floral diversity, increase in alien and invasive floral species	Negative	Low	Low
Floral Habitat	Loss of floral SCC and RDL species	Negative	Low	Low
Surface Water	Service Road Establishment and Subsequent Vehicle Degradation Impacts to Riparian Habitats	Negative	Medium	Low
Avifauna	Electrocution of birds by pylons/towers and in the substation yard.	Negative	Medium	Low
Avifauna	Collision of birds with overhead power line cables	Negative	High	Low
Visual	Change to the visual character of the surrounding area and visual impact on potentially sensitive visual receptors that may perceive the substation to be an unwelcome intrusion.	Negative	Medium	Medium
Socio - Economic	Positive socio-economic impacts as a result of constant, adequate, reliable supply of electricity to the area, thereby contributing positively to the expansion and strengthening of local economic activities.	Positive	High	High

The impact rated for the NO-GO Alternative:

Type of Impact	Description	Status	Significance Rating Pre-Mitigation	Status after mitigation
Socio - Economic	Negative socio-economic impacts as a	Negative	High	High

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Type of Impact	Description	Status	Significance Rating Pre-Mitigation	Status after mitigation
	result of inadequate supply of electricity to the Transnet railway system thereby preventing an increased export tonnage of coal. This will prevent job creation in the area and hinder South Africa's economic growth in the coal export sector.			

To summarise, the negative environmental impacts associated with the proposed development (Preferred Substation Site and Route Alternatives) are generally considered to be local in nature and can be mitigated to a low level of significance in accordance with the detailed EMPr (Appendix G). The project will however, result in positive cumulative impacts on a national, regional and local level as a result of increased economic output in the coal export sector as well as temporary and permanent job creation.

CONCLUSION AND RECOMMENDATIONS

The findings of the specialist studies undertaken within this BA provide an assessment of both the benefits and potential negative impacts anticipated as a result of the proposed development. The findings conclude that there are no environmental fatal flaws that should prevent the proposed project from proceeding. Areas of special concern have however been identified which will require site specific mitigation measures. These are included within the EMPr to ensure that these areas receive special attention.

The proposed development has an overall positive benefit to the socio-economic development of the region. The project is aligned with the objectives of the policies and frameworks at both Provincial and local level.

Power line Option 5 (Containing one 88kV power line within route Alternative 1 and one 88kV power line within route Alternative 2a) has been identified as the preferred alternative as it is both technically feasible and traverses land which is less environmentally sensitive. It will result in the least environmental impact. For a full report of environmental impacts refer to the Impact Assessment Report included in Appendix F.

The Environmental Assessment Practitioner is therefore of the opinion that the negative environmental impacts associated with the proposed preferred route can be mitigated in accordance with the detailed EMPr (Appendix G).

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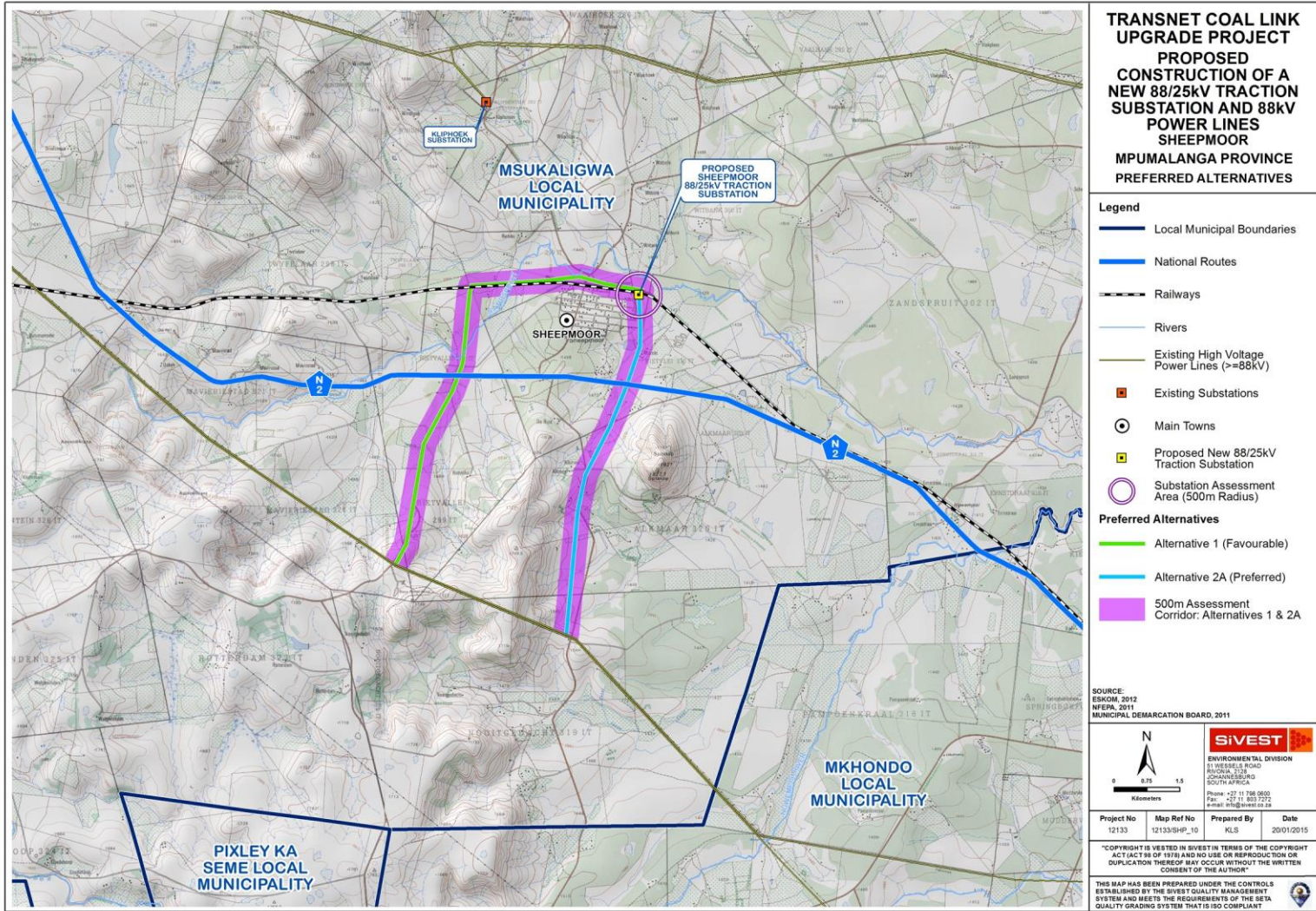


Figure 4: Preferred Alternatives Map

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environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

(For official use only)

File Reference Number:

14/12/16/3/3/1/1102

Application Number:

Date Received:

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

Kindly note that:

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

15. Shape files (.shp) for maps must be included in the electronic copy of the report submitted to the competent authority.

SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section?

YES

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

1. PROJECT DESCRIPTION

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

Background

The proposed Sheepmoor TSS and associated power lines are part of a suite of projects collectively known as the Ermelo-Richards Bay Coal Link Upgrade.

SiVEST Environmental Division has been appointed by Trans-Africa Projects, the implementation agents for Eskom Holdings (SOC) Ltd, to undertake the Environmental Authorisation Process for the proposed project. The project is part of a suite of projects collectively known as the Ermelo-Richards Bay Coal Link Upgrade.

Transnet is South Africa’s sole provider of rail transport infrastructure for coal transportation. One of South Africa’s largest foreign exchange earners is the export of high quality coal products to China. The Transnet rail link between the coal fields in Mpumalanga Province and the export node, the Richards’ Bay Coal Terminal, is one of the busiest railway links in South Africa.

The increase in demand for South Africa’s high quality coal necessitates the increase in production, which in turn has demands on the railway network infrastructure. In response to the increased demand for South Africa’s coal in the global market place, Transnet needs to increase the volume of coal that is being transported between the Mpumalanga coal fields and the Richard’s Bay Coal Terminal. This increase will be facilitated through capital expenditure on two fronts, the supporting infrastructure, i.e. the electrical network supplying the locomotives and the locomotives themselves.

In order for Transnet to accomplish the above they need to upgrade their power supply to their various traction substations between Ermelo and Richards Bay to facilitate the introduction of the new, larger locomotives that will be added to increase the volume of coal being transported and exported. Eskom Holdings (SOC) Ltd being one of the main suppliers of electrical energy in South Africa has been tasked by Transnet to supply the additional energy requirements to these traction substations. In trying to meet the task Eskom Holdings (SOC) Ltd requires environmental authorisation from the Department of Environmental Affairs (DEA) to establish new substations and power lines.

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One line will run to the North and the other will run to the South. The Northern Circuit involves the establishment of a new 88kV power line from Sheepmoor to the existing 88kV line. The Southern Circuit involves the establishment of a new 88kV power line from Sheepmoor to the existing 88kV line. For both the proposed new Northern and Southern power lines, the structure is proposed to be a monopole structure and will cross agricultural and forestry land. All 88kV power lines will be constructed with 132kV capacity but operated at 88kV at inception, in order to cater for future capacity increases.

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- Option 1 – Contain the two 88kV power lines within route Alternative 1 (light green) – approximately 11km;
- Option 2 – Contain the two 88kV power lines within route Alternative 2a (blue) – approximately 8km;
- Option 3 – Contain the two 88kV power lines within route Alternative 2b (orange) – approximately 5.5km;
- Option 4 – Contain the two 88kV power lines within route Alternative 2c (dark green) – approximately 8km;
- Option 5 – Contain one 88kV power line within route Alternative 1 and one 88kV power line within route Alternative 2a;
- Option 6 – Contain one 88kV power line within route Alternative 1 and one 88kV power line within route Alternative 2b; and
- Option 7 – Contain one 88kV power line within route Alternative 1 and one 88kV power line within route Alternative 2c.

The power lines will consist of a series of towers located approximately 200m apart, depending on the terrain and soil conditions. It is proposed that a monopole tower type with a minimum height of 16m and a maximum height of 26m will be used, however the exact tower type will be determined (based on load and other calculations) during the final design stages of the power lines.

Proposed access roads to the substation and along the length of the proposed 88kV power lines will utilise the existing road network. The line corridor width is 500m. Within this 500m corridor a 32m wide servitude will be required for the 88kV power lines. Access to the substation site is to comprise a single-lane, 200m long gravel access road turning off north from the existing gravel road that leads to the Ermelo-Richards Bay railway line 50m north of the proposed traction substation.

For the proposed Sheepmoor TSS a radius of 0.5km from the centre point of the proposed site must be assessed as the orientation of the Substation (SS) is unknown at this stage and as such the positioning of all incoming and outgoing lines and access roads remains to be determined.

The location given for the proposed Sheepmoor TSS is the only locations acceptable to Transnet as it has been determined that they are:

- 1) The optimal positions between the existing substations that will provide the overhead traction supply voltage and current profiles that will meet Transnet's requirements;
- 2) The only positions that meet the requirements of 1) plus there is sufficient space within Transnet's exiting rail reserve for building the substation and does not require the procurement of additional land by Transnet; and
- 3) The only positions that meet the requirements of 1) and 2) and are also closest to a track

gradient suitable for the positioning of an overhead track equipment neutral section (or phase break). The requirement being that electric locomotives be automatically switched off before entering the neutral section and have sufficient momentum to coast through the neutral section without electrical power and then be automatically switched on again after the neutral section. This is necessary as either side of the neutral section is fed on different electrical phases.

The minimum size (footprint) of the proposed Sheepmoor Traction Substation site is approximately 2.0ha, which needs to accommodate:

- Two (2) 88 kV Distribution power line bays;
- Two (2) 88/25 kV transformer bays;
- Two (2) 25kV line bays;
- Stormwater drainage systems;
- Earth mat underlying the proposed substation at approx. 1m depth to ensure earthing/grounding of the substation;
- Associated control room buildings housing support services infrastructure; and
- All 88kV infrastructure will be constructed at 132kV.

At the location of proposed substation sites, earth mats (grounds mats) will be installed underground to provide a uniform potential gradient over the substation site. This is needed so that individuals who are walking in the area are not exposed to excessive voltages across the length of a stride ('step potential') or when they touch a metallic structure ('reach potential'). Additional earth mats also provide a connection to the earth through which lightning or system fault currents can be dissipated. In effect, this objective amounts to managing the potential different relative to a remote location.

In an electrical substation a ground (earth) mat is a mesh of conductive material installed at places where a person would stand to operate a switch or other apparatus; it is bonded to the local supporting metal structure and to the handle of the switchgear, so that the operator will not be exposed to a high differential voltage due to a fault in the substation. Earthing mats normally consist of a rectangular (or square) grid of copper wires that are buried in underground trenches. This grid must lie underneath the entire area to be protected, and must extend beyond any security fencing that may be present to prevent intrusion by civilians.

The soil resistivity will be measured and the detail design of the earth mat completed, once the substation platform has been established. Adherence to the Eskom standard, D-DT 5240, regarding substation earth mats, will be monitored. Additionally, the detailed drainage design will be completed as soon as the site is confirmed, the relevant survey information received and the detailed design aspect of the project underway. Terrace slopes are usually designed with a 1% slope. This allows for adequate storm water run-off to cut-off drains. These flow towards natural drainage courses around the substation.

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

Note: New EIA Regulations were promulgated on 4 December 2014 (Government Gazette No. 38282 of 04 December 2014) and came into effect on 8 December 2014. However, the BA for this proposed project was initiated on 18 December 2013, prior to the new EIA Regulations coming into effect. Therefore in accordance with Regulation 53 (1) of the EIA 2014 Regulations, any applications submitted in terms of the previous NEMA regulations must be undertaken as if the previous NEMA regulations were not repealed. This EIA has therefore been undertaken in

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accordance with the EIA 2010 Regulations which are contained in four Government Notices (GN 543, 544, 545 and 546) which were promulgated on 18 June 2010 and came into effect on 02 August 2010.

Listed activity as described in GN R.544, 545 and 546	Description of project activity
<p>GN R544, activity 10 (i): The construction of facilities or infrastructure for the transmission and distribution of electricity –</p> <p>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or</p>	<p>The capacity of the new distribution lines are 88kV. The construction of the distribution lines will occur outside an urban area.</p>
<p>GN R544, activity 11 (xi): The construction of:</p> <p>(xi) infrastructure or structures covering 50 square metres or more</p> <p>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p>	<p>The surface water assessment identified 42 surface water features. The erection of the pylons might fall within 32m of a watercourse.</p>
<p>GN R. 544 Item 18 (i): The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from</p> <p>(i) a watercourse;</p>	<p>The surface water assessment identified 42 surface water features. It is likely that construction activities may need to take place within at least one of these surface water features. During these construction activities, soil may be removed from the watercourses.</p>
<p>GN 546 activity 4(a)ii. (cc) (ee) (gg): The construction of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p>(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p>	<p>The construction of a road may be required for construction and maintenance purposes. The botanical assessment identified Critical biodiversity areas along the proposed power line corridors due to the presence of two threatened vegetation types namely: Vulnerable Eastern Highveld Grassland and the Endangered Wakkerstroom Montane Grassland.</p> <p>Should the road be required for the proposed development, the road may be greater than 4 m wide but will be less than 8 m wide.</p>
<p>GN R546, Activity 12 (b): The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation.</p> <p>(b) Within critical biodiversity areas identified in bioregional plans;</p>	<p>The construction of the power lines may require the clearance of an area of 300 square metres where 75% of the vegetation is indigenous. The botanical assessment identified Critical biodiversity areas along the proposed power line corridors due to the presence of two threatened vegetation types namely: Vulnerable Eastern Highveld Grassland and the Endangered</p>

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<p>GN R546, Activity 13(a)(c)ii.(cc): The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation</p> <p>(a) Critical biodiversity areas and ecological support areas as identified in systematic biodiversity plans adopted by the competent authority.</p> <p>c) In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga, Northern Cape and Western Cape:</p> <p>ii. Outside urban areas, the following:</p> <p>(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority.</p>	<p>Wakkerstroom Montane Grassland.</p> <p>The botanical assessment identified Critical biodiversity areas along the proposed power line corridors due to the presence of two threatened vegetation types namely: Vulnerable Eastern Highveld Grassland and the Endangered Wakkerstroom Montane Grassland. The construction of the substation will require the clearance of an area of 2 hectares where 75% of the vegetation may be indigenous.</p>
<p>GN R546, Activity 14(a)(i): The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation:</p> <p>(a) In Eastern Cape, Free State, KwaZulu-Natal, Gauteng, Limpopo, Mpumalanga, Northern Cape, Northwest and Western Cape:</p> <p>i. All areas outside urban areas.</p>	<p>The botanical assessment identified Critical biodiversity areas along the proposed power line corridors due to the presence of two threatened vegetation types namely: Vulnerable Eastern Highveld Grassland and the Endangered Wakkerstroom Montane Grassland.</p> <p>The construction of the power lines and substation may require the clearance of an area of 5 hectares where 75% of the vegetation is indigenous.</p>
<p>GN R546, Activity 16 (iv)(a)ii.(dd)(ff): The construction of:</p> <p>(iv) infrastructure or structures covering 10 square metres or more</p> <p>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p> <p>(a) In Eastern Cape, Free State, KwaZulu-Natal, Limpopo, Mpumalanga and Northern Cape:</p> <p>(ii) Outside urban areas, in:</p> <p>(dd) Sensitive Areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as</p>	<p>The surface water assessment identified 42 surface water features. The erection of the pylons might fall within 32m of a watercourse. The botanical assessment identified Critical biodiversity areas along the proposed power line corridors due to the presence of two threatened vegetation types namely: Vulnerable Eastern Highveld Grassland and the Endangered Wakkerstroom Montane Grassland.</p>

adopted by the competent authority. (ff) Critical biodiversity areas or ecosystem service areas identified in systematic biodiversity plans adopted by the competent authority or in biological plans.	
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2. FEASIBLE AND REASONABLE ALTERNATIVES

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

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

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

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the, competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

a) Site alternatives

<p>Please note: The location given for the proposed Sheepmoor TSS is the only locations acceptable to Transnet as it has been determined that they are:</p>
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| <ul style="list-style-type: none"> 1) The optimal positions between the existing substations that will provide the overhead traction supply voltage and current profiles that will meet Transnet’s requirements; 2) The only positions that meet the requirements of 1) plus there is sufficient space within Transnet’s exiting rail reserve for building the substation and does not require the procurement of additional land by Transnet; and 3) The only positions that meet the requirements of 1) and 2) and are also closest to a track gradient suitable for the positioning of an overhead track equipment neutral |
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section (or phase break). The requirement being that electric locomotives be automatically switched off before entering the neutral section and have sufficient momentum to coast through the neutral section without electrical power and then be automatically switched on again after the neutral section. This is necessary as either side of the neutral section is fed on different electrical phases.

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
Sheepmoor Traction Substation	26° 42' 53.600" S	30° 18' 31.100" E
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
N/A N/A		
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)

In the case of linear activities:

Corridor Alternatives:

Option 1 (Alternative 1)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

Latitude (S):

Longitude (E):

26° 42' 53.600" S	30° 18' 31.100" E
26° 43' 22.555" S	30° 16' 7.628" E
26° 46' 12.580" S	30° 15' 8.840" E

Option 2 (Alternative 2a)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

26° 42' 53.600" S	30° 18' 31.100" E
26° 44' 56.412" S	30° 17' 52.111" E
26° 47' 5.358" S	30° 17' 29.573" E

Option 3 (Alternative 2b)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

26° 42' 53.600" S	30° 18' 31.100" E
26° 45' 9.604" S	30° 16' 38.411" E
26° 46' 22.780" S	30° 15' 36.043" E

Option 4 (Alternative 2c)

- Starting point of the activity
- Middle/Additional point of the activity
- End point of the activity

26° 42' 53.600" S	30° 18' 31.100" E
26° 45' 13.250" S	30° 19' 12.148" E
26° 47' 11.923" S	30° 17' 41.085" E

Option 5 (Preferred Combination of Alternative 1 and Alternative 2a)

- Starting point of the activity (Alt 1)
- Middle/Additional point of the activity (Alt 1)
- End point of the activity (Alt 1)
- Starting point of the activity (Alt 2a)
- Middle/Additional point of the activity (Alt 2a)
- End point of the activity (Alt 2a)

26° 42' 53.600" S	30° 18' 31.100" E
26° 43' 22.555" S	30° 16' 7.628" E
26° 46' 12.580" S	30° 15' 8.840" E
26° 42' 53.600" S	30° 18' 31.100" E
26° 44' 56.412" S	30° 17' 52.111" E
26° 47' 5.358" S	30° 17' 29.573" E

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Option 6 (Combination of Alternative 1 and Alternative 2b)

• Starting point of the activity (Alt 1)	26° 42' 53.600" S	30° 18' 31.100" E
• Middle/Additional point of the activity (Alt 1)	26° 43' 22.555" S	30° 16' 7.628" E
• End point of the activity (Alt 1)	26° 46' 12.580" S	30° 15' 8.840" E
• Starting point of the activity (Alt 2b)	26° 42' 53.600" S	30° 18' 31.100" E
• Middle/Additional point of the activity (Alt 2b)	26° 45' 9.604" S	30° 16' 38.411" E
• End point of the activity (Alt 2b)	26° 46' 22.780" S	30° 15' 36.043" E

Option 7 (Combination of Alternative 1 and Alternative 2c)

• Starting point of the activity (Alt 1)	26° 42' 53.600" S	30° 18' 31.100" E
• Middle/Additional point of the activity (Alt 1)	26° 43' 22.555" S	30° 16' 7.628" E
• End point of the activity (Alt 1)	26° 46' 12.580" S	30° 15' 8.840" E
• Starting point of the activity (Alt 2c)	26° 42' 53.600" S	30° 18' 31.100" E
• Middle/Additional point of the activity (Alt 2c)	26° 45' 13.250" S	30° 19' 12.148" E
• End point of the activity (Alt 2c)	26° 47' 11.923" S	30° 17' 41.085" E

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

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

Please refer to Appendix J3 for the bend point coordinates of the power line corridor for each alignment

b) Lay-out alternatives

Alternative 1 (preferred alternative)		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 2		
Description	Lat (DDMMSS)	Long (DDMMSS)
Alternative 3		
Description	Lat (DDMMSS)	Long (DDMMSS)

c) Technology alternatives

Alternative 1 (preferred alternative)
N/A
Alternative 2
N/A
Alternative 3
N/A

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

Alternative 1
Alternative 2
Alternative 3
N/A

e) No-go alternative

The No-Go Alternative refers to the option of not implementing the proposed infrastructure development and ultimately the continuation of the current *status quo*. In order for Transnet to achieve the increased demand for coal and the associated mining activities they need to upgrade their power supply to their various traction substations between Ermelo and Richards Bay. This will facilitate the introduction of the new, larger locomotives that will be added to increase the volume of coal being transported and exported. Should this development not go forward then the electricity demands will not be met and this may affect the mining activities in the area. Trans-Africa Projects, on behalf of Eskom Pty Ltd and Transnet Railways, is therefore proposing the above mentioned Sheepmoor substation and associated power lines, in order to provide the necessary electrical infrastructure in the area, to allow for the increase in coal transport between Richards Bay, KwaZulu-Natal and Ermelo, Mpumalanga.

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

3. PHYSICAL SIZE OF THE ACTIVITY

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

Substation Alternative:

Alternative 1¹ (preferred activity alternative)

Alternative A2 (if any)

Alternative A3 (if any)

Size of the activity:

20000 m ²

or, for linear activities:

Power Line Alternative:

Option 1 (Alternative 1)

Option 2 (Alternative 2a)

Option 3 (Alternative 2b)

Option 4 (Alternative 2c)

Option 5 (Preferred Combination of Alternative 1 and Alternative 2a)

Option 6 (Combination of Alternative 1 and Alternative 2b)

Option 7 (Combination of Alternative 1 and Alternative 2c)

Length of the activity:

(approx.) 11km
(approx.) 8km
(approx.) 5.5km
(approx.) 9km
(approx.) 19km
(approx.) 16.5km
(approx.) 20km

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

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

Alternative:	Size of the site/servitude:
Option 1 (Alternative 1)	(approx.) 55m
Option 2 (Alternative 2a)	(approx.) 32m
Option 3 (Alternative 2b)	(approx.) 32m
Option 4 (Alternative 2c)	(approx.) 32m
Option 5 (Preferred Combination of Alternative 1 and Alternative 2a)	(approx.) 32m
Option 6 (Combination of Alternative 1 and Alternative 2b)	(approx.) 32m
Option 7 (Combination of Alternative 1 and Alternative 2c)	(approx.) 32m

4. SITE ACCESS

Does ready access to the site exist?

✓ YES

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

Describe the type of access road planned:

- Where possible existing access roads and tracks will be used.
- In instances where no access is available, an access road will be created.
- New access tracks will be single-lane 200m long gravel roads/tracks turning off north from the existing gravel road that leads to the Ermelo-Richards Bay railway line 50m north of the proposed traction substation.
- The potential impacts associated mitigation measures with the creation of access roads are addressed in the EMPr (Appendix G).
- The exact position and type of access roads cannot be determined until the power line positions have been confirmed through the servitude negotiation process. It is therefore recommended that the final road and power line alignments are submitted to the competent authority once these are confirmed and prior to construction

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

5. LOCALITY MAP

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

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s);
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);

- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection).

A locality map is included in Appendix A.

6. LAYOUT/ROUTE PLAN

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

The site or route plans must indicate the following:

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

A Site Layout may indicating the alternative route alignments is included Appendix A.

7. SENSITIVITY MAP

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

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

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

Various sensitivity maps for the proposed site alternatives are included in Appendix A.

8. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to

this report. It must be supplemented with additional photographs of relevant features on the site, if applicable.

Site Photographs taken along the proposed alternative route corridors for the power lines and substation site are included in Appendix B. Key features of the site are depicted in the site photographs.

9. FACILITY ILLUSTRATION

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

A schematic drawings of the proposed tower types are included in Appendix C.

10. ACTIVITY MOTIVATION

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

1. Is the activity permitted in terms of the property's existing land use rights?	✓ YES	
The surrounding area of Sheepmoor is substantially altered with existing eucalyptus and pine plantations and an informal community living near the proposed site of the substation. The proposed power line route traverses vacant land and the existing plantation corridors with some commercial cultivation occurring within the western and northern parts of the study area. The proposed development does not alter the surrounding area substantially as this has already been substantially altered and the vegetation has been transformed for agricultural purposes. A change in land use will not be required as the power line servitude will be considered as special use within the existing land use.		

2. Will the activity be in line with the following?		
(a) Provincial Spatial Development Framework (PSDF)	✓ YES	
<p>Reference is made to the Mpumalanga Economic Growth and Development Path (2011) Section 3.7.1 that mentions that the Integrated Resource Plan will help improve the economic efficiency and create jobs. In order to facilitate growth and job creation in the agricultural sector Section 4.3.2.2 of the Mpumalanga Economic Growth and Development Path (2011) places emphasis on infrastructure development including electricity. The electricity production industry of Mpumalanga is contributing directly and indirectly to the economic growth and job creation as eleven of the currently operational coal-fired power stations in the country are situated in Mpumalanga and contribute roughly 76% of the total electricity generated in South Africa (Mpumalanga Economic Growth and Development Path (2011) Section 4.3.2.4 on Mining and energy industries).</p> <p>The main purpose of the proposed development is for electricity distribution to the railway for coal transport to Richard's Bay. Revenue will here by be generated for the province from exporting coal to Richard's Bay via the railway. The electricity from the proposed substations will be for the primary use by the railway line as currently, this electricity is too unstable to be used for public/commercial use.</p> <p>The Coal Rail Link is identified as one of the existing infrastructures that greatly complement and expand existing opportunities for manufacture and trade, if upgraded and further developed. The proposed Power line and Substation is considered an upgrade of the Coal Link railway line by providing additional electricity capacity to increase the operational capacity of the railway line.</p>		
(b) Urban edge / Edge of Built environment for the area		✓ Please explain
The proposed development will lie outside the urban edge or built environment.		
(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).	✓ YES	
<p>Reference is made to the Msukaligwa IDP (2013-2014) Section 6.5.2 identifies the coal link railway as contributing the provisions of job opportunities to local communities. Section 4.2.5 identifies the need to increase rail transport within the province and the municipality to relieve strain on the road networks due to industrial haulage of goods. Section 6.1.5.3.2 further identifies the opportunity to utilize the rail network as a future passenger commuting alternative. Therefore, the proposed Sheepmoor Substation and associated Power lines indirectly support the Msukaligwa IDP (2013-2014) by providing essential electricity to the railway to further its operational capacity for coal transport, and potentially commuter transport.</p>		
(d) Approved Structure Plan of the Municipality	✓ NO	
Approved Structure Plans do not exist for the area in question.		

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<p>(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)</p>	<p>✓ YES</p>	
<p>No EMF is available for the area in question. The proposed development would not compromise the integrity of the environmental management priorities for the area. No environmental fatal flaws were identified and it was established that the impacts can be suitably mitigated to low levels. In addition, the development would result in socio-economic benefits for the area at large.</p>		
<p>(f) Any other Plans (e.g. Guide Plan)</p>		<p>✓ NO</p>
<p>N/A – no further plans are available for the area in question</p>		
<p>3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?</p>	<p>✓ YES</p>	
<p>Yes, the land use is considered within the timeframe of the Msukaligwa IDP, as the proposed development would be operational by 2015.</p>		
<p>4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)</p>	<p>✓ YES</p>	
<p>The proposed project is not a societal priority, however the proposed project is necessary to increase the electricity capacity of the Transnet railway between Richards Bay and Mpumalanga to respond to increased coal transport demands. This project is designated as part of a “Strategic Infrastructure Project” to aid in the continued development of the mining and export industry of South Africa. Therefore, this project will impact positively on the local, provincial and national economies and ensure that South Africa continues to improve its national transport system, hereby increasing economic output and revenue.</p>		

<p>5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</p>		<p>✓ Please explain</p>
<p>The proposed development does not require municipal services. The proposed power line will require water and electricity resources, however these will be provided through trucked water and diesel generators.</p> <p>Construction waste will be generated during the construction process. Any excavated material not suitable for re-use will be disposed of at a licensed land-fill site. Hazardous material generation is not anticipated, however should small quantities be produced, these would be disposed of at a licensed Hazardous Materials Landfill site. All relevant local and district municipalities were provided with the opportunity to comment on the proposed development as well as the DBAR. Confirmation from the Municipality will be forwarded to the DEA upon receipt. Proof of request for comments from the Municipality have been included as an Appendix to the FBAR.</p>		
<p>6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)</p>		<p>✓NO</p>
<p>The proposed development is not provided for in the infrastructure planning of the municipality as it is a national-level SIP project that is not provided for on a municipal level. Eskom has identified the need to develop the Sheepmoor Substation and Power line in order to meet the increasing electricity demands for coal railway transport.</p>		
<p>7. Is this project part of a national programme to address an issue of national concern or importance?</p>	<p>✓ YES</p>	
<p>This project forms part of a suite of projects throughout Mpumalanga and Kwazulu-Natal, collectively known as the Ermelo-Richards Bay Coal Link Upgrade Project. This project will significantly increase the volume of coal that South Africa can export, meeting the international demand for South African coal. This suite of projects are further considered to form part of the National Strategic Infrastructure Projects and falls within the parameters of SIP 2 and SIP 10, thus this proposed development is considered to be of national importance. The proposed development is further in line with the National Spatial Development Perspective which states that “South Africa will become a nation in which investment in infrastructure...support government’s growth and development objectives: by focusing economic growth...in areas where it is most effective and sustainable; by fostering development on the basis of local potential...”.</p>		

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<p>8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)</p>	<p>✓ YES</p>	
<p>As mentioned above, the proposed corridor occurs on already transformed or altered land and the proposed study area is already substantially altered. As such, the proposed development is a suitable development within this context. The development will conform to the typical visual character and pattern of elements that make up the landscape form. The proposed development is near existing power line infrastructure already present in the area.</p>		
<p>9. Is the development the best practicable environmental option for this land/site?</p>	<p>✓ YES</p>	
<p>As mentioned above, the proposed corridor occurs on already transformed or altered land and the proposed study area is already substantially altered. As such, the proposed development is a suitable development within this context. The development will conform to the typical visual character and pattern of elements that make up the landscape form.</p>		
<p>10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?</p>	<p>✓ YES</p>	
<p>The negative impacts of the proposed development are low due to the location in a rural area on low grade agricultural land as well as the presence of existing power line and substation infrastructure in the immediate vicinity. Any residual environmental impacts will be mitigated based on the EMPr (Appendix G). The proposed project is necessary to increase the electricity capacity of the Transnet railway between Richards Bay and Mpumalanga to respond to increased coal transport demands. This project is designated as part of a “Strategic Infrastructure Project” to aid in the continued development of the mining and export industry of South Africa. Therefore, this project will impact positively on the local, provincial and national economies and ensure that South Africa continues to improve its national transport system, hereby increasing economic output and revenue.</p>		
<p>11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?</p>		<p>✓ NO</p>
<p>The proposed development of the Sheepmoor Substation and associated Turn-in Power lines serve to increase the electricity capacity to accommodate increasing transport of coal for export. The negative impacts associated with the proposed development are generally low. However, no precedent is set for future development as the proposed development will increase electrical input into the existing Transnet railway line to transport coal for export.</p>		
<p>12. Will any person’s rights be negatively affected by the proposed activity/ies?</p>		<p>✓ NO</p>
<p>Landowners affected, as well as landowners adjacent to the proposed preferred Northern Route 1, preferred southern Route 2a and the southern alternative routes 2b and 2c have been notified timeously (see Appendix E2) about the proposed development and given opportunity to comment. A public workshop was held two weeks into the Draft PPP Phase. Therefore all affected I&AP’s, were given an opportunity to voice any concerns with regards to the proposed development. Consent for land access and construction (where applicable) will be obtained prior to begin of the construction phase.</p>		
<p>13. Will the proposed activity/ies compromise the “urban edge” as defined by the local municipality?</p>		<p>✓ NO</p>
<p>The proposed power line lies outside the urban edge.</p>		

BASIC ASSESSMENT REPORT

14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPs)?	✓ YES	
The proposed development will contribute to two (2) SIP namely: SIP 2 on “strengthening the logistics and transport corridor between SA’s main industrial hubs” and SIP 10: Electricity Transmission and Distribution for all – <i>“Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity.”</i>		
15. What will the benefits be to society in general and to the local communities?	✓ Please explain	
The proposed Sheepmoor Power line and Substation, as part of the Coal Link Upgrade, will ensure that electricity capacity to the Ermelo, Mpumalanga – Richards Bay, KwaZulu-Natal railway line contributes to the increase in coal transport capacity for export. Therefore, an increased national revenue will benefit the South African society in general, while local and regional job creation will provide potential employment to the region.		
16. Any other need and desirability considerations related to the proposed activity?	✓ Please explain	
All need and desirability aspects have been identified and considered in this report.		
17. How does the project fit into the National Development Plan for 2030?	✓ Please explain	
With reference to Chapter 4 – Economic infrastructure , sub-chapter “The energy reality” (pg. 164) the NDP notes that “The quality of market competition and regulation in the energy sector has been far from optimal” and that the “crippling [rail] transport constraints” result in “the lack of rail capacity that constrain[s]...the expansion of coal exports.” It is further noted that the export capacity at the Richard’s Bay coal terminal is one third higher than the rail capacity from the coal fields. Therefore, the proposed Sheepmoor Substation and power line, as part of the Ermelo-Richards Bay Coal Link Upgrade Project, directly contribute to alleviating the identified coal export constraints outlined in the NDP for 2030.		

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

- a) *promote the integration of the principles of environmental management set out in section 2 into the making of all decisions which may have a significant effect on the environment;*
- **This Basic Assessment process takes into account all the general objectives of Integrated Environmental Management. The social, economic, cultural and biophysical impacts have been considered and evaluated. The impacts will be mitigated and managed according to a detailed Environmental Management Programme.**
- b) *Identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits and promoting compliance with the principles of environmental management set out in section 2;*
- **Impacts associated with the proposed development of the Sheepmoor Substation and 88kV Powerlines (construction and operational phases) have been identified, assessed and mitigation measures provided. These are detailed in Section D of this BAR.**
- c) *Ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them;*
- **This Application is being undertaken in accordance with the NEMA EIA Regulations (2010), the provisions of which themselves take into account the general objectives of Integrated Environmental Management in Section 23 of the NEMA**
 - **Please also refer to the attached Environmental Management Programme (Appendix G)**
- d) *Ensure that adequate and appropriate opportunity for public participation in decisions that may affect the environment;*
- **This Application has been undertaken in accordance with the Public Participation Requirements (and proposed deviations) set out in the NEMA EIA Regulations (2010). Public Participation Deviations are included in Section C of the BAR.**
 - **Please refer to section C of this BAR for details relating to PPP.**
- e) *Ensure the consideration of environmental attributes in management and decision-making which may have a significant effect on the environment; and*
- **This Basic Assessment process takes into account all the general objectives of Integrated Environmental Management. The social, economic, cultural and biophysical impacts have been considered and evaluated. The impacts will be mitigated and managed according to a detailed Environmental Management Programme.**
- f) *Identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section*
- **This Basic Assessment process takes into account all the general objectives of Integrated Environmental Management. The social, economic, cultural and biophysical impacts have been considered and evaluated. The impacts will be mitigated and managed according to the detailed Environmental Management Programme attached at Appendix G.**

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

The principles of environmental management as set out in section 2 of the NEMA require that environmental management must place people and their needs at the forefront of development and that development must be socially, environmentally and economically sustainable. As described above; these principles have been taken into account by undertaking a thorough PPP in order to ensure that all Interested and Affected Parties (I&APs) are given the opportunity to be involved in the BA process and ultimately that their comments are taken into consideration by the DEA when reviewing the application. Several specialist studies were also undertaken to ensure that the development is sustainable and that disturbance to the environment is avoided where possible, minimised through appropriate mitigation measures and remedied via appropriate measures.

11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

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

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
National Environmental Management Act, 107 of 1998. NEMA EIA Regulations (Government Notices 543; 544; 546)	Identification of activities triggered by the proposed project for a Basic Assessment/Environmental Authorisation	Department of Environmental Affairs	1998 2010
DEA Integrated Environmental Management Guideline Series, Guideline 5: Assessment of the Environmental Impact Assessment Regulations, 2010	Guideline for the correct interpretation of legislation	Department of Environmental Affairs	2010
DEA Integrated Environmental Management Guideline Series, Guideline 7: Public Participation in the Environmental Impact Assessment Process, 2012	Guideline for the correct interpretation of regulations	Department of Environmental Affairs	2012
National Water Act, 36 of 1998	A General Authorisation may be required for the altering or temporary impedance of watercourses during the construction phase.	Department of Water Affairs	1998
National Heritage Act, 25 of 1999	Authorisation from Amafa/SAHRA for	Amafa/SAHRA	1999

BASIC ASSESSMENT REPORT

	commencement of construction and for a permit if required		
Mpumalanga Economic Growth and Development Path (2011)	Identifies the need for additional electricity supply based on spatial development information on a provincial level.	Mpumalanga Province Government	2011
Msukaligwa Integrated Development Plan (2007-2012)	Identifies the importance of a Power line development in a District Development context.	Msukaligwa Local Municipality	2007
Msukaligwa Spatial Development Framework (2010)	Identifies the importance of visual and other environmental impacts in association with Power line developments.	Msukaligwa Local Municipality	2010
Gert Sibande District Municipality Integrated Development Plan (2012/13 – 2016.17)	Utilised for socio-economic status of the receiving environment	Gert Sibande District Municipality	2012
Census 2011 Municipal report Mpumalanga	Utilised for socio-economic status of the receiving environment	Statistics South Africa	2011
The Vegetation of South Africa, Lesotho and Swaziland. Mucina & Rutherford (2006). SANBI, Pretoria	Utilised as a reference guide for the identification of upgrade-specific environmental information	CapeNature	2006
Mpumalanga Nature Conservation Act (MNCA) (Act 10 of 1998)	Permits must be obtained from the Mpumalanga Tourism and Parks Agency (MTPA).	Mpumalanga Tourism and Parks Agency (MTPA).	1998

12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

a) Solid waste management

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

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

✓YES	
Approx. 3m ³	

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

Solid waste (minimal construction waste and regular household waste) will be collected by independent contractors and disposed of at a registered licensed municipal landfill site with proof of safe disposal required.

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

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Solid waste (construction waste and builders rubble) will be collected by independent contractors and disposed of at the registered licensed municipal landfill site with proof of safe disposal required.

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

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

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

N/A

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

N/A

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

Can any part of the solid waste be classified as hazardous in terms of the NEM:WA? [REDACTED] ✓ NO

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

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

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

b) Liquid effluent

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? [REDACTED] ✓ NO

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

Will the activity produce any effluent that will be treated and/or disposed of on site? [REDACTED] ✓ NO

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

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

If YES, provide the particulars of the facility:

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

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

N/A

c) Emissions into the atmosphere

Will the activity release emissions into the atmosphere other than exhaust emissions and dust associated with construction phase activities?

NO

If YES, is it controlled by any legislation of any sphere of government? **N/A**

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

If NO, describe the emissions in terms of type and concentration:

N/A

d) Waste permit

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

NO

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

e) Generation of noise

Will the activity generate noise?

YES

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

NO

Describe the noise in terms of type and level:

Noise, during normal working hours associated with the construction phase of the project is anticipated. Any equipment used during the construction or operational phase will not exceed a noise level of 80 decibel amperes (dbA).

13. WATER USE

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

<input checked="" type="checkbox"/> Municipal	Water board	Groundwater	River, stream, dam or lake	Other	The activity will not use water
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If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month: **N/A**

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

YES

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

Awaiting comments from Department of Water and Sanitation (DWS) on the Draft BAR to confirm if a water use authorisation is required for construction activities at/near watercourses. Should an application be necessary, proof of submission to DWS will be provided in due course. A minimal amount of water may be required during the construction phase, this water will be supplied by the Municipality and will be trucked to the site. The amount of water is assumed to be negligible and only required for the foundations. The Municipality will be consulted in this regard through the Public Participation Process.

14. ENERGY EFFICIENCY

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

The proposed development does not have specific energy efficient measures implemented.

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

The proposed development does not contain any alternative energy sources, as the development is an electricity transmission and distribution infrastructure.

SECTION B: SITE/AREA/PROPERTY DESCRIPTION

Important notes:

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

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

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

3. Has a specialist been consulted to assist with the completion of this section? **✓YES**
 If YES, please complete the form entitled “Details of specialist and declaration of interest” for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

Property description/physical address:

Province	Mpumalanga	
District Municipality	Gert Sibande District Municipality	
Local Municipality	Msukaligwa Local Municipality	
Ward Number(s)	11	
Farm name and number	Please refer to full list in Appendix E3	
Portion number	Please refer to Appendix 3	
SG Code	Please refer to Appendix 3	

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

Current land-use zoning as per local municipality IDP/records:

Agriculture

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

Is a change of land-use or a consent use application required? **✓NO**

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1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Option 1 (Alternative 1):

✓ Flat	✓1:50 1:20	-	✓1:20 1:15	-	✓1:15 1:10	-	1:10 – 1:7,5	✓1:7,5 1:5	-	Steeper than 1:5
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Option 2 (Alternative 2a):

✓ Flat	✓1:50 1:20	-	✓1:20 1:15	-	1:15 – 1:10	✓1:10 1:7,5	-	1:7,5 – 1:5	Steeper than 1:5
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Option 3 (Alternative 2b):

✓ Flat	✓1:50 1:20	-	✓1:20 1:15	-	1:15 – 1:10	1:10 – 1:7,5	✓1:7,5 1:5	-	Steeper than 1:5
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Option 4 (Alternative 2c):

✓ Flat	✓1:50 1:20	-	✓1:20 1:15	-	✓1:15 1:10	-	1:10 – 1:7,5	✓1:7,5 1:5	-	Steeper than 1:5
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Option 5 (Preferred Combination of Alternative 1 and Alternative 2a):

✓ Flat	✓1:50 1:20	-	✓1:20 1:15	-	✓1:15 1:10	✓1:10 1:7,5	-	✓1:7,5 1:5	-	Steeper than 1:5
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Option 6 (Combination of Alternative 1 and Alternative 2b):

✓ Flat	✓1:50 1:20	-	✓1:20 1:15	-	✓1:15 1:10	-	1:10 – 1:7,5	✓1:7,5 1:5	-	Steeper than 1:5
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Option 7 (Combination of Alternative 1 and Alternative 2c):

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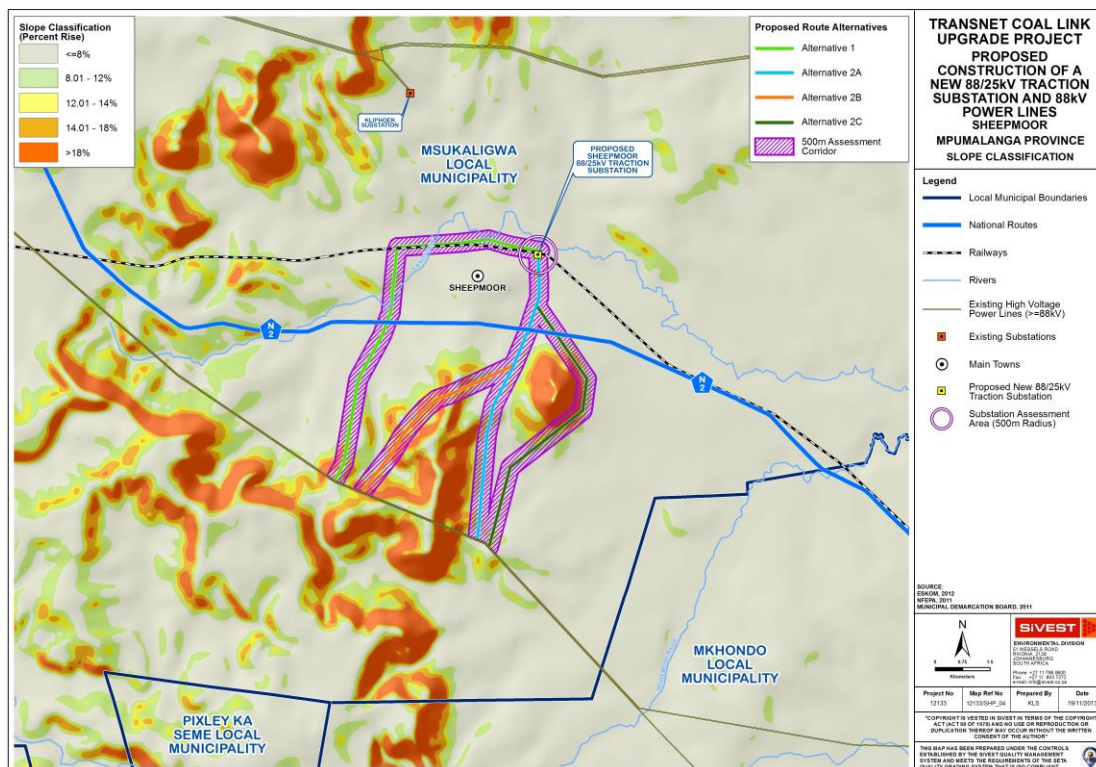


Figure 5: Slope classification Map

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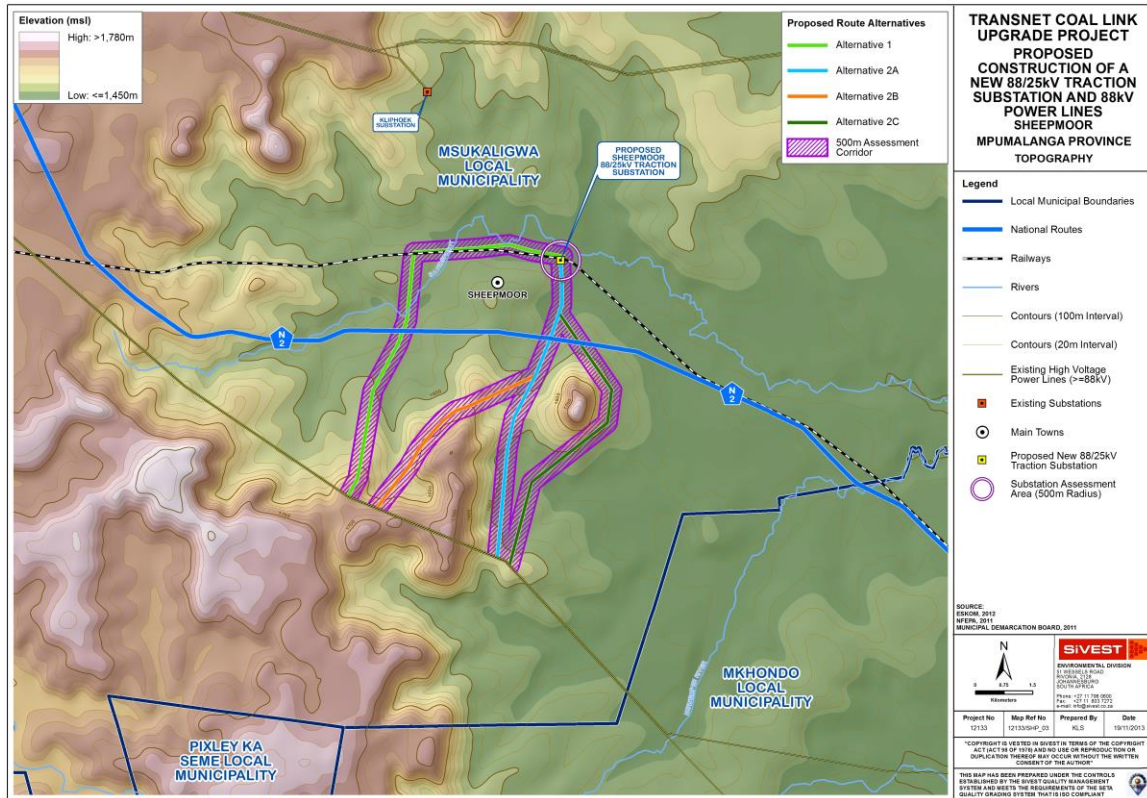


Figure 6: Topography Map

2. LOCATION IN LANDSCAPE

All Route Alternatives & Substation site

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

2.1 Ridgeline	<input type="checkbox"/>	2.4 Closed valley	<input type="checkbox"/>	2.7 Undulating plain / low hills	<input checked="" type="checkbox"/>
2.2 Plateau	<input checked="" type="checkbox"/>	2.5 Open valley	<input checked="" type="checkbox"/>	2.8 Dune	<input type="checkbox"/>
2.3 Side slope of hill/mountain	<input checked="" type="checkbox"/>	2.6 Plain	<input type="checkbox"/>	2.9 Seafront	<input type="checkbox"/>

3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

	Substation Alternative: (Preferred Alternative)	All Corridor Alternatives:
Shallow water table (less than 1.5m deep)	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> YES
Dolomite, sinkhole or doline areas	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> NO
Seasonally wet soils (often close to water bodies)	<input checked="" type="checkbox"/> YES	<input checked="" type="checkbox"/> YES
Unstable rocky slopes or steep slopes with loose soil	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> NO

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Dispersive soils (soils that dissolve in water)
 Soils with high clay content (clay fraction more than 40%)
 Any other unstable soil or geological feature
 An area sensitive to erosion

	✓NO		✓NO
	✓NO		✓NO
	✓NO		✓NO
	✓NO		✓NO

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

A geotechnical assessment of the proposed substation sites was conducted by Mark Richter of WorleyParsons RSA (Pty) Ltd and is included in Appendix D8. The geological assessment concluded that the Sheepmoor substation site is underlain by transported and residual dolerite soils.
Described in specialist Geotechnical Assessment Report (refer to Appendix D).

4. GROUNDCOVER

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

Option 1: Alternative 1

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

Option 1: Alternative 2a

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

Option 3: Alternative 2b

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

Option 4: Alternative 2c

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

BASIC ASSESSMENT REPORT

Option 5: Preferred Combination of Alternative 1 and Alternative 2a

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

Option 6: Combination of Alternative 1 and Alternative 2b

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

Option 7: Combination of Alternative 1 and Alternative 2c

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

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

5. SURFACE WATER

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

Perennial River		✓NO	
Non-Perennial River	✓YES		
Permanent Wetland	✓YES		
Seasonal Wetland	✓YES		
Artificial Wetland		✓NO	
Estuarine / Lagoonal wetland		✓NO	

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

Reference is made to the Freshwater Assessment by Alistair Fyfe (as attached in Appendix D).

Permanent Wetlands

Thirteen (13) hillslope seep wetlands were identified within the study area. The topography of the general landscape comprised predominantly of undulating hills. Surface water drainage that was identified was constrained to the relatively steep sloping hillslope seep wetlands, often found on the mid-slopes on elevated hills.

A large portion of land within the proposed development area has been altered, either through pastoral land or dissecting dirt roads. Specific to the identified Hillslope seep wetlands within the study area, *Pennisetum clandestinum* was found to be the dominant vegetation species, alongside Nile grass (*Acroceras macrum*), which is often associated with wetlands and other damp places.

Non-Perennial Rivers/Tributaries:

Twenty-one (21) channelled valley-bottom wetlands were identified within the study area. The topography of the general landscape comprised predominantly of undulating hills. Surface water drainage that was identified was constrained to the relatively gentle sloping channelled valley-bottom wetlands.

Large portions of land within the proposed development area have been altered, either through pastoral land or dissecting dirt and tarred roads. This has led to the occurrence of *Eragrostis curvula* and *Hyparrhenia hirta*, both of which prefer disturbed habitats such as cultivated lands and roadside reserves. Specific to the identified channelled valley-bottom wetlands within the study area, obligate wetland species such as the perennial tufted *Cyperus marginatus*, the perennial ground-creeping *Phragmites australis*, the brown spikeleted *Pycneus mundtii*, the densely tufted, alien species *Juncus effuses*, and the densely green-clumped *Schoenoplectus brachyceras*. Furthermore, the facultative negative wetland plat species *Cyperus congestus* was present alongside the margins of present water bodies.

Permanent Wetlands:

Four (4) unchannelled valley-bottom wetlands were identified within the study area. The topography of the general landscape comprised of predominantly flat terrain, with the presence of few undulating hills. Surface water drainage that was identified was constrained to the relatively gentle sloping unchannelled valley bottom wetlands.

In most cases the unchannelled valley bottom wetlands were surrounded by pastoral land. Within the specific HGM unit, the perennial grass *Imperata cylindrica* was the dominant -graminoid species. *Kyllinga melanosperma*, an obligate wetland species, formed dense conspicuous stands along the water margins. Alongside the wetted edge, the densely-tufted, perennial *Juncus effuses* was present. *Pennisetum clandestinum* was prevalent on the outer edges of the unchannelled valley-bottom wetlands, moving into the surrounding pastoral land.

6. LAND USE CHARACTER OF SURROUNDING AREA

All Power Line Route Alternatives & the Substation Site

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

✓ Natural area	Dam or reservoir	Polo fields
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BASIC ASSESSMENT REPORT

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

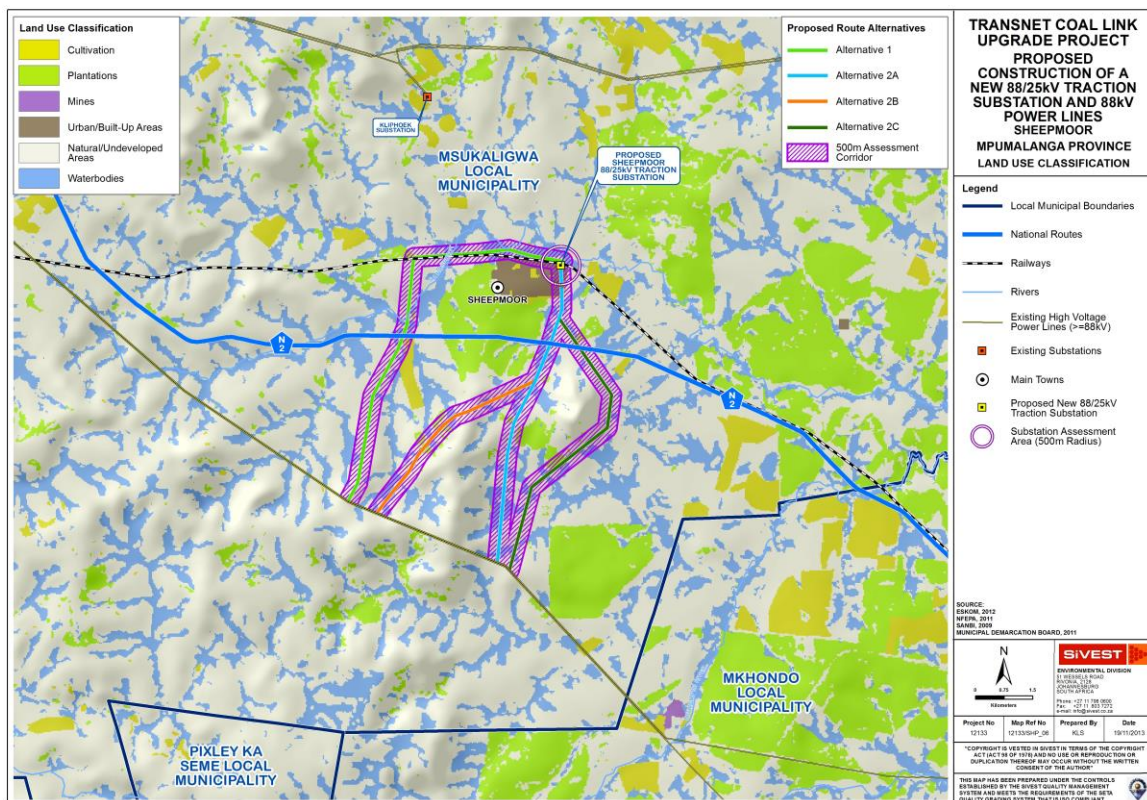


Figure 7: Land Use Map

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

N/A

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

N/A

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

N/A

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

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

The proposed area for the substation occurs in **Vulnerable Eastern Highveld Grassland**, with **Vulnerable Eastern Temperate Freshwater Wetlands** also present. The four possible corridors for the 88 kV lines occur in **Vulnerable Eastern Highveld Grassland** and **Endangered Wakkerstroom Montane Grassland**, with **Vulnerable Eastern Temperate Freshwater**. These vegetation types occur within Critical Biodiversity Areas.

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

7. CULTURAL/HISTORICAL FEATURES

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

✓YES

A Heritage Assessment was conducted by Frans E Prins of Active Heritage CC and is included in Appendix D6. A later Iron Age site was identified approximately 30m to the north of the proposed preferred northern power line trajectory. This later Iron Age site consists of eight stone walled circles. Five circles are approximately 4m x 5m in diameter and four measures approximately 9m X 10m. The whole area covered by the stone walled circles measures 40m x 15m. There are no artefacts visible on the surface. It was most probably built and occupied by early Sotho-speaking agropastoralists during the early 19th century.

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

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A cultural heritage survey of the proposed Sheepmoor Traction substation and power lines, Mpumalanga Province identified three heritage features on the identified footprint. These include two Cemeteries and one Later Iron Age Site.

The Later Stone age site was identified along the proposed preferred northern power line route 1. The first identified cemetery is located adjacent to the proposed Sheepmoor Traction substation, while the second cemetery is located along the preferred southern power line route 2a.

It is suggested that the developer shift the trajectory for the proposed substation and associated power lines at least 30m in the opposite direction from the relevant heritage sites in order to allow for a buffer zone of at least 40m.

Mitigation would be impractical and there is no archaeological reason why the proposed development may not proceed on the remainder of the footprint as planned. However, attention is drawn to the South African National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) which requires that operations that expose archaeological or historical remains should cease immediately, pending evaluation by the provincial heritage agency in the Mpumalanga Province.

Described in specialist Heritage Assessment Report (refer to Appendix D6).

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

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

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

	✓ NO
	✓ NO

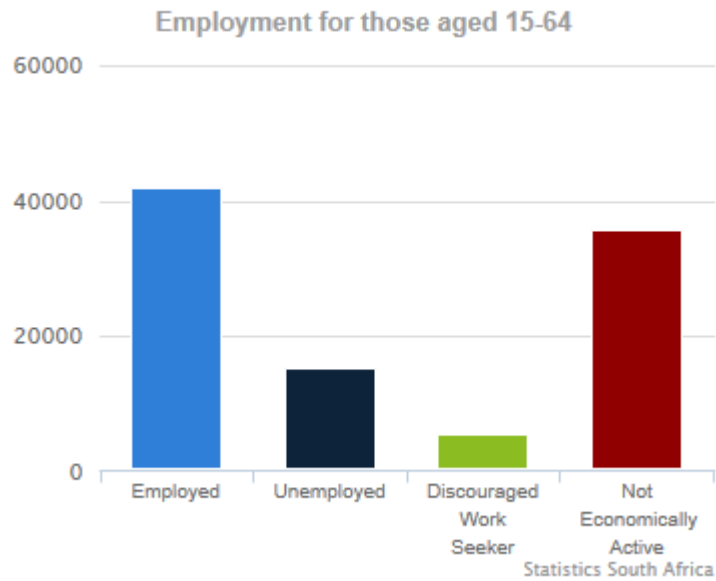
8. SOCIO-ECONOMIC CHARACTER

a) Local Municipality

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

Level of unemployment:

Reference is made to Statistics South Africa with unemployment statistics for Msukaligwa Local Municipality as follows:



“According to Statistics South Africa Census 2011, in the Msukaligwa Local Municipality, there are 41 698 people employed, whereas 5 311 people are discouraged work-seekers. The unemployment rate is 26.8%. There are also 15 267 unemployed people in the Msukaligwa Local Municipality. Of the youth aged 15–34 residing in the Msukaligwa Local Municipality, 20 261 are employed while 10 679 are unemployed. The unemployment rate for the youth is 34.5%.

Reference is made to the Gert Sibande District Municipality IDP (2012 – 2016): Levels of unemployment (gender specific) are as follows:

GERT SIBANDE DM		UNEMPLOYMENT 2009 OFFICIAL DEFINITION (%)	
LABOUR		UNEMPLOYMENT RATE,	NUMBER OF UNEMPLOYED PEOPLE
Male		18.1%	34,216
Female		28.4%	40,160
Total		22.5%	74,376

Source: Global Insight South Africa: Regional Explorer 421 (2.2), 2010

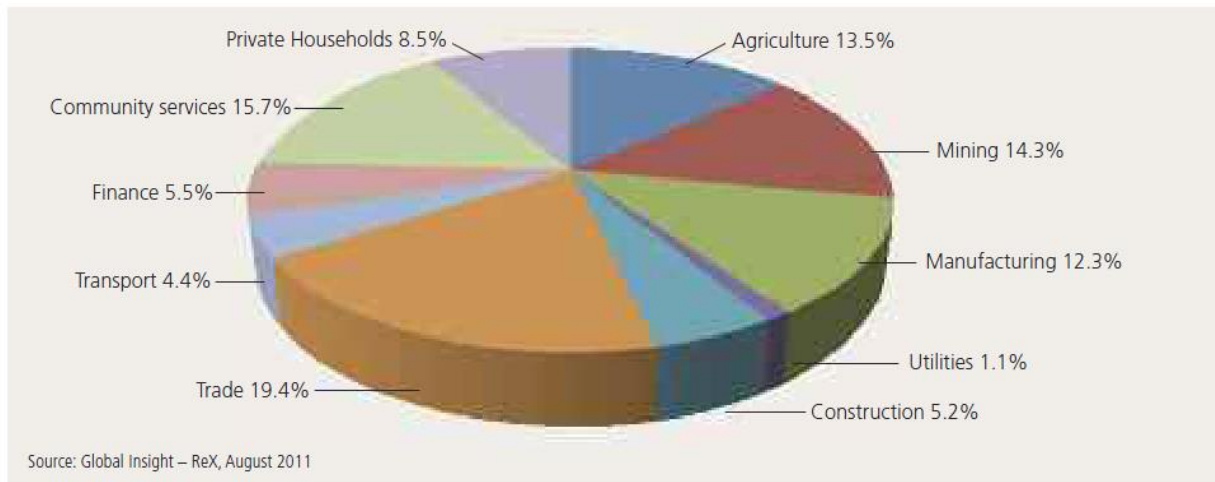
“The table above indicates that there are more female’s unemployed than men. While the unemployment rate for females is also much higher than men.”

Economic profile of local municipality:

Reference is made to the Gert Sibande District Municipality IDP (2012 – 2016): Economic Sector employment per local municipality

“The above table illustrates sectorial employment per local municipalities in Gert Sibande in 2010 where Msukaligwa employed the largest share of individuals in agriculture sector (24.2 %) across all the municipalities. However, the next highest economic employment sectors in this municipality were the transport and community service industry with 20.9 % and 19.9 % respectively.”

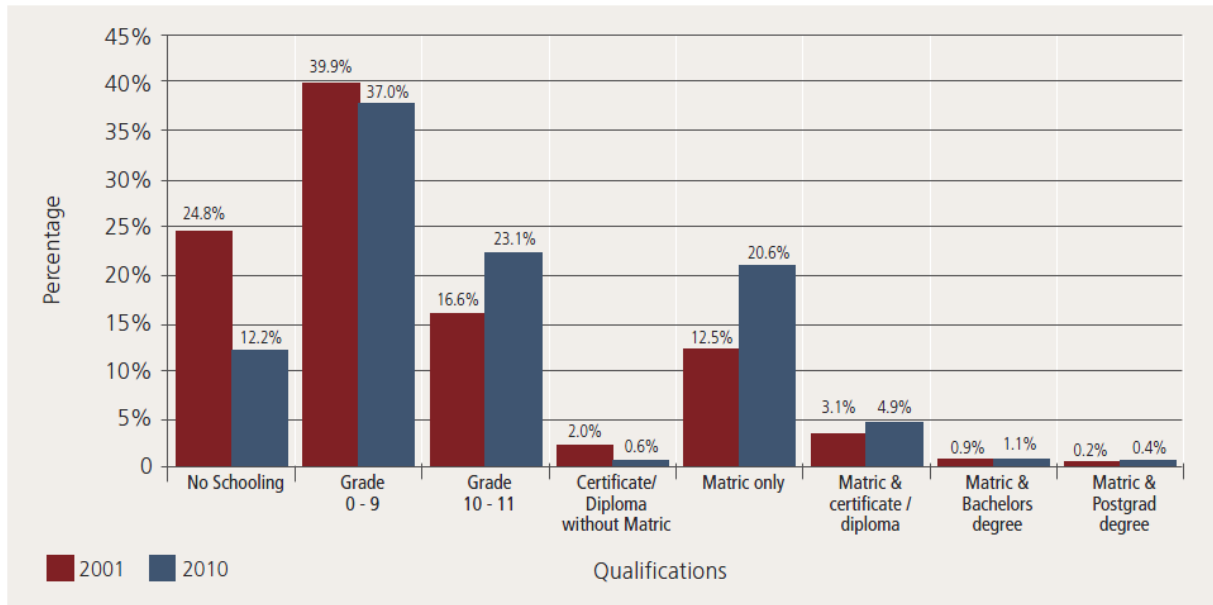
Reference is made to the Gert Sibande District Municipality IDP (2012 – 2016): Sector Percentage employment by industry



“Employment by industry in Gert Sibande. Trade (19.4 %), community services (15.7 %), mining (14.3 %) and agriculture (13.5 %) contributed the largest shares towards employment in the district in 2010. Utilities (1.1 %) and transport (4.4 %) sectors recorded the lowest employment contributions.”

Level of education:

Reference is made to the Gert Sibande District Municipality IDP (2012 – 2016) on education statistics:



Source: Local Municipalities Data 2010

“The percentage of people (15 years +) with no schooling in Gert Sibande District Municipality decreased from 24.8 % in 1996 to 12.2 % in 2010 whilst the percentage of people with matric and post matric qualifications increased from 16.6 % to 27.1 % in 2010. It is also evident that the number of people with no schooling and without matric is decreasing as more people are now opting to finish their matric and continue to obtain certificates, diplomas or degrees.”

b) Socio-economic value of the activity

What is the expected capital value of the activity on completion?

What is the expected yearly income that will be generated by or as a result of the activity?

Will the activity contribute to service infrastructure?

Is the activity a public amenity?

How many new employment opportunities will be created in the development and construction phase of the activity/ies?

What is the expected value of the employment opportunities during the development and construction phase?

What percentage of this will accrue to previously disadvantaged individuals?

How many permanent new employment opportunities will be created during the operational phase of the activity?

What is the expected current value of the employment opportunities during the first 10 years?

What percentage of this will accrue to previously disadvantaged individuals?

R 32 000 000
Transnet will be able to increase their export tonnage.
<input checked="" type="checkbox"/> YES
<input checked="" type="checkbox"/> NO
Unknown
R 320 000
80%
Unknown
Unknown
80%

9. BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult <http://bgis.sanbi.org> or BGIShelp@sanbi.org. Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

PREFERRED SUBSTATION SITE

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

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	✓ Other Natural Area (ONA)	No Natural Area Remaining (NNR)	ONA is relevant here.

- b) **Indicate and describe the habitat condition on site**

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc.).
Natural	30%	The area has highly disturbed, degraded Vulnerable Eastern Highveld Grassland with low species richness. Existing impacts on the terrestrial vegetation are due to overgrazing, over-burning and human related activities. The stream and wetland which are present in the area have also been affected by the latter impacts (Fig. 8).
Near Natural (includes areas with low to moderate level of alien invasive plants)	35%	Habitat condition in the "Near Natural" areas is worse than in the "Natural" areas, also due to human related activities. This habitat quality category includes highly disturbed, degraded Vulnerable Eastern Highveld Grassland.
Degraded (includes areas	10%	Infestation of Black Wattle (<i>Acacia mearnsii</i>), a category 2 plant invader.

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heavily invaded by alien plants)		
Transformed (includes cultivation, dams, urban, plantation, roads, etc.)	25%	Edge of Sheepmoor village, cemetery, railway lines and gravel roads.

c) Complete the table to indicate:

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

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

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

The area has highly disturbed, degraded **Vulnerable** Eastern Highveld Grassland with very low Species richness. A Black Wattle infestation (*Acacia mearnsii*, a category 2 plant invader) is present in part of the area. Part of a wetland and stream (**Vulnerable** Eastern Temperate Freshwater Wetlands) are present in the area and also exhibit disturbance due to human related activities. No threatened plant species or species of conservation concern were found in this area. Some sensitive vegetation areas are present.

Described in specialist Botanical Assessment Report (refer to Appendix D1).

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CORRIDOR ALTERNATIVE 1

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

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
✓Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	Other Natural Area (ONA)	No Natural Area Remaining (NNR)	CBA – CBA is relevant here due to the presence of two threatened vegetation types: Vulnerable Eastern Highveld Grassland & Endangered Wakkerstroom Montane Grassland

- b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc.).
Natural	60%	Vulnerable Eastern Highveld Grassland covers most of the corridor, except towards the end where Endangered Wakkerstroom Montane Grassland is present. Habitat condition and vegetation quality are better between waypoints 7 and 8 where Eastern Highveld Grassland with moderate species richness is found as well as between waypoints 9 and 10 and towards waypoint 11 on the eastern side of the centre-line. Towards waypoint 11 and in the vicinity of this waypoint, Wakkerstroom Montane Grassland has moderate species richness, which increases the habitat and vegetation quality in this area. Sensitive vegetation areas are present in this corridor. The remaining natural areas have lower species richness and poorer habitat condition mainly due to overgrazing, overburning, alien invader trees and the edge effects of roads and tracks. Railway lines, roads and tracks are found in this corridor increasing the disturbance and lowering the habitat quality. Several good quality streams and wetlands that are functioning well ecologically are present in the corridor.
Near Natural	10%	Areas of Black Wattle (<i>Acacia mearnsii</i>), a category 2 plant

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(includes areas with low to moderate level of alien invasive plants)		invader, are present along the corridor.
Degraded (includes areas heavily invaded by alien plants)	10%	Infestations of Black Wattle (<i>Acacia mearnsii</i>) and Grey Poplar (<i>Populus X canescens</i>) occur along the corridor. Both species are category 2 plant invaders.
Transformed (includes cultivation, dams, urban, plantation, roads, etc.)	20%	Edge of Sheepmoor village, railway lines, gravel roads and plantations of <i>Eucalyptus grandis</i> and Pine.

c) Complete the table to indicate:

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

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

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

Vulnerable Eastern Highveld Grassland covers most of the corridor, except towards the end where Endangered Wakkerstroom Montane Grassland is present. Vegetation quality is better between waypoints 7 and 8 where Eastern Highveld Grassland with moderate species richness is found, as well as on the eastern side of the centre-line. Towards waypoint 11 and in the vicinity of this waypoint, Wakkerstroom Montane Grassland has moderate species richness, which increases the vegetation quality in this area. Sensitive vegetation areas are present in this corridor. The remaining natural areas have lower species richness due to overgrazing, over-burning and the edge effects of roads and tracks. No threatened plant species or species of conservation concern were found in this corridor. Several good quality streams and wetlands (Vulnerable Eastern Temperate Freshwater Wetlands) that are functioning well ecologically are present in the corridor.
Described in specialist Botanical Assessment Report (refer to Appendix D1).

CORRIDOR ALTERNATIVE 2A

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

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
✓ Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	Other Natural Area (ONA)	No Natural Area Remaining (NNR)	CBA – CBA is relevant here due to the presence of two threatened vegetation types: Vulnerable Eastern Highveld Grassland & Endangered Wakkerstroom Montane Grassland

- b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc.).
Natural	70%	This corridor is covered largely by Eastern Highveld Grassland together with small areas of Wakkerstroom Montane Grassland. Disturbance due to overgrazing, over-burning, alien invader trees and the edge effects of roads is relatively high in this corridor, and the grassland is generally of moderate to low species richness. Habitat condition is consequently moderate to poor. Habitat of better condition with moderate species richness is found from waypoints 16 to 21. Existing tracks and roads are present through most of the corridor, consequently increasing disturbance and lowering habitat quality. Numerous good quality and ecologically sound streams, wetlands and associated vegetation are present in this corridor.
Near Natural (includes areas with low to moderate level of alien invasive plants)	10%	Areas of Black Wattle (<i>Acacia mearnsii</i>), a category 2 plant invader, are present along the corridor.
Degraded (includes areas heavily invaded by	10%	Infestations of Black Wattle (<i>Acacia mearnsii</i>), a category 2 plant invader, occur along the corridor.

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alien plants)		
Transformed (includes cultivation, dams, urban, plantation, roads, etc.)	10%	Edge of Sheepmoor village, gravel roads, tracks and plantations of <i>Eucalyptus grandis</i> .

c) Complete the table to indicate:

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

Terrestrial Ecosystems		Aquatic Ecosystems						
Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	Critical	Wetland (including rivers, depressions, channelled and unchannelled wetlands, flats, seeps pans, and artificial wetlands)			Estuary		Coastline	
	<input checked="" type="checkbox"/> Endangered							
	<input checked="" type="checkbox"/> Vulnerable							
	Least Threatened	<input checked="" type="checkbox"/> YES	NO	UNSURE	YES	<input checked="" type="checkbox"/> NO	YES	<input checked="" type="checkbox"/> NO

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

This corridor is covered largely by Eastern Highveld Grassland together with small areas of Wakkerstroom Montane Grassland. Disturbance due to overgrazing, over-burning, alien invader trees and the edge effects of roads is relatively high, and the grassland is generally of moderate to low species richness. More sensitive areas of moderate species richness from waypoints 16 to 21 are present. No threatened plant species or species of conservation concern were found. Numerous good quality streams, wetlands and associated vegetation (**Vulnerable** Eastern Temperate Freshwater Wetlands) that are functioning well ecologically, are present in this corridor.

Described in specialist Botanical Assessment Report (refer to Appendix D1).

CORRIDOR ALTERNATIVE 2B

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

Systematic Biodiversity Planning Category	If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
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✓ Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	Other Natural Area (ONA)	No Natural Area Remaining (NNR)	CBA – CBA is relevant here due to the presence of two threatened vegetation types: Vulnerable Eastern Highveld Grassland & Endangered Wakkerstroom Montane Grassland
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b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc.).
Natural	99%	This corridor is covered with Vulnerable Eastern Highveld Grassland and Endangered Wakkerstroom Montane Grassland. Habitat condition is good, disturbance is low and plant species richness is generally moderate, but high towards the end of the corridor, where Eastern Highveld Grassland and Wakkerstroom Montane Grassland are present. The whole corridor is sensitive botanically. There are very few existing tracks and no roads in this corridor, consequently minimizing disturbance and increasing habitat quality. Numerous streams, several wetlands and associated vegetation of good quality and ecological integrity are present.
Near Natural (includes areas with low to moderate level of alien invasive plants)	1%	Small areas of Black Wattle (<i>Acacia mearnsii</i>), a category 2 plant invader, are present in the corridor.
Degraded (includes areas heavily invaded by alien plants)	0%	N/A
Transformed (includes cultivation, dams, urban, plantation, roads, etc.)	0%	N/A

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c) Complete the table to indicate:

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

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

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

This corridor is covered with **Vulnerable Eastern Highveld Grassland** and **Endangered Wakkerstroom Montane Grassland**. Out of the four corridors compared in this report, this corridor has the highest presence of **Endangered Wakkerstroom Montane Grassland**. Disturbance is low and plant species richness is generally moderate, but high towards the end of the corridor, where Eastern Highveld Grassland and Wakkerstroom Montane Grassland are present. Threatened plant species or species of conservation concern may well be present in this corridor, although none were found. The whole corridor is sensitive botanically. Numerous streams, several wetlands and associated vegetation (Vulnerable Eastern Temperate Freshwater Wetlands), all of good quality and ecological integrity, are present in this corridor.

Described in specialist Botanical Assessment Report (refer to Appendix D1).

CORRIDOR ALTERNATIVE 2C

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

Systematic Biodiversity Planning Category				If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan
✓ Critical Biodiversity Area (CBA)	Ecological Support Area (ESA)	Other Natural Area (ONA)	No Natural Area Remaining (NNR)	CBA – CBA is relevant here due to the presence of two threatened vegetation types: Vulnerable Eastern Highveld Grassland & Endangered Wakkerstroom Montane Grassland

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b) Indicate and describe the habitat condition on site

Habitat Condition	Percentage of habitat condition class (adding up to 100%)	Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc.).
Natural	94%	This corridor is covered largely by Eastern Highveld Grassland together with a small area of Wakkerstroom Montane Grassland. Disturbance due to overgrazing, over-burning and alien invader trees is relatively high, and the grassland is generally of low species richness. Habitat condition is consequently relatively poor. Existing tracks are present through most of the corridor. Several good quality and ecologically sound streams, wetlands and associated vegetation are present in this corridor.
Near Natural (includes areas with low to moderate level of alien invasive plants)	2%	Areas of Black Wattle (<i>Acacia mearnsii</i>), a category 2 plant invader, are present along the corridor.
Degraded (includes areas heavily invaded by alien plants)	2%	Infestations of Black Wattle (<i>Acacia mearnsii</i>), a category 2 plant invader, occur along the corridor.
Transformed (includes cultivation, dams, urban, plantation, roads, etc.)	2%	Gravel roads, tracks and plantations of Black Wattle (<i>Acacia mearnsii</i>), a category 2 plant invader.

c) Complete the table to indicate:

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

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

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

This corridor is covered largely by Eastern Highveld Grassland together with a small area of Wakkerstroom Montane Grassland. Disturbance due to overgrazing, over-burning and alien invader trees is relatively high in this corridor, and the grassland is generally of low species richness. No threatened plant species or species of conservation concern were found. Several good quality and ecologically sound streams, wetlands and associated vegetation (**Vulnerable** Eastern Temperate Freshwater Wetlands) are present in this corridor.

Described in specialist Botanical Assessment Report (refer to Appendix D1).

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT AND NOTICE

Publication name	Sowetan Newspaper	
	Ermelo Tribune	
	Zululand Observer	
	Paulpietersburg Advertiser	
Date published	27 th March 2015	
	31 st March 2015	
	27 th March 2015	
	02 nd April 2015	
Site notice position	Latitude	Longitude
	S 26° 31' 41.9"	E 29° 59' 18.0"
	S 26° 42' 56.0"	E 30° 18' 27.4"
	S 26° 46' 12.0"	E 30° 15' 07.2"
	S 26° 44' 00.0"	E 30° 18' 21.9"
To be included in the FBAR		
Date placed	Site Notices were placed between the 24 th March – 28 th March 2015	

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

Proof of the Advertisements and Site notices are included in Appendix E1

2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 54(2)(e) and 54(7) of GN R.543.

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

Title, Name and Surname	Affiliation/ key stakeholder status	Contact details (tel number or e-mail address)
Refer to Appendix E for all key stakeholder information.		

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

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

Proof that the key stakeholder received written notification of the proposed activities is included in Appendix E2.

BASIC ASSESSMENT REPORT

3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summary of main issues raised by I&APs	Raised by	Summary of response from EAP
Questioned whether the above mentioned projects requires a Water Use License (WULA).	Lerato Mathibela Eskom Distribution	Yes, a Water Use License will be required. However, this will be undertaken once the areas that require a Water Use License have been identified. Kelly Tucker - SiVEST
What databases the EAP and Specialists had used for their studies. Upon looking through his email he saw that SiVEST had enquired about the databases that should be used and ML was happy that SiVEST and the specialists were using adequate databases / datasets for the analysis of the study area. Requested that SiVEST send through shapefiles of the proposed powerline corridors There may be some red flags with regards to protected areas, important biodiversity areas, and negotiating with land owners. MTPA would compare the shapefiles against the datasets that they have and they would send comments through to the DEA directly. MTPA is happy for the powerlines to follow existing servitudes as far as possible.	Mervyn Lotter Biodiversity planning MTPA	Comment noted regarding the datasets used. Shapefiles were sent to MTPA on the 28 April 2015. No further comments were received at the time that this C&R Report was finalised for the FBAR. KT noted all comments. Kelly Tucker / Jenny Barnard - SiVEST
Your Letter dated 26 March 2015 refers, the application was received on 16 April 2015. You are advised that the application is in the process of being investigated and that you will be advised accordingly of this Department's comments.	Mr R Ryan / Mrs J Reddy KZN Department of Transport, Infrastructure and Regional Services	Comment noted No comments were received at the time that this C&R Report was finalised for the FBAR. Kelly Tucker - SiVEST
This letter serves as a notice for receipt of the Draft Basic Assessment Report for the Proposed Development, dated 23 March 2015. Should any further information be required, please do not hesitate to contact this office.	Mr DJ Maivha DAFF	Comment noted Kelly Tucker - SiVEST
The District acknowledges receipt of your BID send for our attention.	Mr. D Hlanyane Senior Manager: Environmental Health and Environmental Services Gert Sibande District Municipality	Comment noted. Kelly Tucker - SiVEST
Mpumalanga Agriculture would like to register as an interested and affected party on the above mentioned project so as to ensure that our member's interests are protected.	Robert Davel. Assistent Bestuurder Mpumalanga Landbou	Comment noted. Kelly Tucker - SiVEST
Queried as to whether these projects were being conducted under the New Environmental	Tebogo Chauke Eskom	The DEA stipulated that any applications submitted to the DEA

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regulations.	Distribution	after December 2014 need to be conducted under the new regulations. However, these applications were submitted in December 2013 and then update in January 2014 therefore are being conducted under the NEMA 2010 regulations. <i>Kelly Tucker - SiVEST</i>
<p>Comments and issues raised by Interested and Affected Parties, as well as responses sent by the EAP during the Public Participation Process have been incorporated into the Final Basic Assessment Report and the Comments and Responses chapter (Appendix E3) for review by all registered stakeholders and for submission to the Department of Environmental Affairs.</p>		

4. COMMENTS AND RESPONSE REPORT

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

The Comments and Response Report (C&RR) is included in Appendix E3.

5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

Authority/Organ of State	Contact person (Title, Name and Surname)	Tel No	Fax No	e-mail	Postal address
Please refer to Appendix E4.					

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

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

Proof that the Authorities and Organs of State received written notification of the proposed activities is included in Appendix E4 of the FBAR. A list of Authorities and Organs of State that were notified about the proposed development and sent the DBAR for review is included in Appendix E4.

6. CONSULTATION WITH OTHER STAKEHOLDERS

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

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

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

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

Refer to Appendix E for a list of registered I&APs, copies of correspondence and minutes of meetings.

SECTION D: IMPACT ASSESSMENT

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

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

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

Please note: The impacts for all the proposed alternatives are similar and for this reason the impacts have been combined when they apply to all the alternatives and where the impacts diverge two (2) separate rows will be created highlighting the difference in terms of significance.

Activity	Impact summary	Significance	Proposed mitigation
Biodiversity	Direct impacts:		
	Disturbance to degraded Vulnerable Eastern Highveld Grassland and Vulnerable Eastern Temperate Freshwater Wetlands.	Low Negative (Substation Alternative)	<ul style="list-style-type: none"> - Locate substation in existing disturbed area close to Sheepmoor village. - Minimise disturbance impacts by confining construction and related activities to construction area. - Avoid any impacts to streams and wetlands and determine an ecologically sound buffer to protect them. - Use existing roads for access to construction site. - Ensure that no driving off-road occurs. - Confine all activities to specific construction site. - Remove all waste materials from construction site.
	Disturbance to and loss of Vulnerable Eastern Highveld Grassland, Endangered Wakkerstroom Montane Grassland and Vulnerable Eastern Temperate Freshwater Wetlands. This corridor is largely covered by Eastern	Medium Negative (Power line Alternative 1)	<ul style="list-style-type: none"> - Adhere to the recommended alignment: South of the centre-line from waypoint 1 to 6, east of the centre-line from waypoint 6 to 9 and west of the centre-line from waypoint 9 to 12, because these areas are less botanically sensitive and more disturbed in terms of overgrazing, over-burning and presence of alien trees. - Avoid any impacts to streams and wetlands and determine an ecologically sound buffer to protect these. - Use existing tracks and roads for installing and servicing the power-line. - Ensure that no driving off-road or off-track occurs. - Confine all activities to specific construction and installation sites. - Remove all waste materials from construction and installation sites.

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Activity	Impact summary	Significance	Proposed mitigation
	Highveld Grassland.		
	Disturbance to and loss of Eastern Highveld Grassland and Wakkerstroom Montane Grassland, both of which are well represented in this corridor. Disturbance to and loss of Vulnerable Eastern Temperate Freshwater Wetlands.	High Negative (Power line Alternative 2B)	<ul style="list-style-type: none"> - This corridor should not be used because of the presence of sensitive threatened vegetation types. - There are very few existing tracks in this corridor for installing and servicing the power-line. New tracks will have to be made through both threatened vegetation types. - A focused vegetation survey along specific new tracks and at construction and installation sites will be necessary to check for threatened plant species and plant species of conservation concern. - Ensure that no driving off-road or off-track occurs. - Confine all activities to specific construction and installation sites. - Remove all waste materials from construction and installation sites.
	Disturbance to and loss of Vulnerable Eastern Highveld Grassland, Endangered Wakkerstroom Montane Grassland and Vulnerable Eastern Temperate Freshwater Wetlands. This corridor is largely covered by Eastern Highveld Grassland.	Medium Negative (Power line Alternative 2A)	<ul style="list-style-type: none"> - Adhere to recommended alignment: Install power-line east of centre-line from waypoint 1 to 21 because this alignment is less botanically sensitive and more disturbed in terms of overgrazing, over-burning and presence of alien trees. - Use existing tracks and roads for installing and servicing the power-line. - Ensure that no driving off-road or off-track occurs. - Confine all activities to specific construction and installation sites. - Remove all waste materials from construction and installation sites.
	Disturbance to and loss of Vulnerable Eastern Highveld Grassland, Endangered Wakkerstroom Montane Grassland and Vulnerable Eastern Temperate Freshwater Wetlands. This corridor is largely covered	Medium Negative (Power line Alternative 2C)	<ul style="list-style-type: none"> - Adhere to recommended alignment: Install power-line east of centre-line from waypoint 15 to 25 because this alignment is less botanically sensitive and more disturbed in terms of overgrazing, over-burning and presence of alien trees. - Use existing tracks and roads for installing and servicing the power-line. - Ensure that no driving off-road or off-track occurs. - Confine all activities to specific construction and installation sites. - Remove all waste materials from construction and installation sites.

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Activity	Impact summary	Significance	Proposed mitigation
	by Eastern Highveld Grassland.		
	Loss of floral habitat including sensitive habitat types, fragmentation of habitat.	Medium Negative	<ul style="list-style-type: none"> - Consider the Sheepmoor Substation Alternative and Line Alternative 2A as the preferred options. - Keep the proposed development infrastructure as well as any temporary access roads within designated low sensitivity areas as far as possible. - Minimise wetland crossings to what is absolutely necessary. - Acute angle crossings of wetlands must be minimised. - Restrict vehicles to travelling only on designated roadways to limit the ecological footprint of the proposed development activities. - All soils compacted as a result of construction activities falling outside of the development footprint areas should be ripped and profiled. - To prevent the erosion of top soils, management measures may include berms, soil traps, hessian curtains and storm water diversion away from areas susceptible to erosion. It must be ensured that topsoil stockpiles are located outside of any drainage lines and areas susceptible to erosion.
Indirect impacts:			
	Loss of floral diversity, increase in alien and invasive floral species	Medium Negative	<ul style="list-style-type: none"> - Consider the Sheepmoor Substation Alternative and Line Alternative 2A as the preferred options. - Species specific and area specific alien and invasive floral eradication recommendations: - Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used; - Footprint areas should be kept as small as possible when removing alien plant species; and - No vehicles should be allowed to drive through designated sensitive wetland areas during the eradication of alien and weed species.
	Loss of floral SCC and RDL species	Medium Negative	<ul style="list-style-type: none"> - Consider the Sheepmoor Substation Alternative and Line Alternative 2A as the preferred options. - Keep the proposed development infrastructure within current servitude areas as far as possible. - Should any RDL or other protected plant species be encountered within the study, the following should be ensured: - If any threatened species will be disturbed, ensure effective relocation of individuals to suitable offset areas; and - All rescue and relocation plans should be overseen by a suitably qualified specialist. - A site specific walkdown of the preferred substation and power line alternative must be performed prior to construction in order to rescue and relocate any such species.
	Loss of floral habitat including sensitive habitat types, fragmentation of habitat.	Low Negative (Operational Phase)	<ul style="list-style-type: none"> - Avoid unnecessary clearance of vegetation, especially within sensitive habitat. - Minimise access and maintenance road wetland crossings to what is absolutely necessary. - Acute angle crossings of wetlands must be minimised. - Restrict vehicles to travelling only on designated roadways to limit the ecological footprint of the proposed operational activities. - Monitor access roads and disturbed areas for erosion and implement control measures as necessary.
	Loss of floral	Low Negative	<ul style="list-style-type: none"> - Avoid unnecessary clearance of vegetation, especially within

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Activity	Impact summary	Significance	Proposed mitigation
	diversity, increase in alien and invasive floral species	(Operational Phase)	sensitive habitat. <ul style="list-style-type: none"> - Minimise access and maintenance road wetland crossings to what is absolutely necessary. - Restrict vehicles to travelling only on designated roadways to limit the ecological footprint of the proposed development activities. - Monitor access roads and disturbed areas for erosion and implement control measures as necessary. - Species specific and area specific alien and invasive floral eradication recommendations: - Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used; - Footprint areas should be kept as small as possible when removing alien plant species; and - No vehicles should be allowed to drive through designated sensitive wetland areas during the eradication of alien and weed species.
	Loss of floral SCC and RDL species	Low Negative (Operational Phase)	<ul style="list-style-type: none"> - Avoid unnecessary clearance of vegetation, especially within sensitive habitat. - Minimise access and maintenance road wetland crossings to what is absolutely necessary. - Acute angle crossings of wetlands must be minimised. - Restrict vehicles to travelling only on designated roadways to limit the ecological footprint of the proposed development activities. - Monitor access roads and disturbed areas for erosion and implement control measures as necessary. - Should any RDL or other protected plant species be encountered during the operational and maintenance phase, the following should be ensured: - If any threatened species will be disturbed, ensure effective relocation of individuals to suitable offset areas; and - All rescue and relocation plans should be overseen by a suitably qualified specialist. - Should the need arise to obtain permits, this process needs to be undertaken.
Cumulative impacts:			
None identified.			
Desktop Faunal	Direct impacts: Vegetation clearing, disturbance and the use of heavy machinery and human presence along the power line route and at substation locations during construction is likely to negatively affect resident fauna directly and through habitat	Medium Negative	<ul style="list-style-type: none"> - Construction staff should undergo environmental induction to ensure that they are aware of fauna-related issues and that no fauna are harmed during construction. This pertains especially to fauna such as snakes which are persecuted regardless of the threat they may or may not pose. - The footprint of the development in the vicinity of the rivers should be kept as low as possible and existing access roads should be used wherever possible so that new river crossings are not required. - All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. - Fires should only be allowed on site if required for construction purposes, and then only in designated areas and a controlled environment. Refer to Eskom fire management procedures. - If any parts of site such as construction camps must be lit at

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Activity	Impact summary	Significance	Proposed mitigation
	loss.		<p>night, this should be done with low-UV type lights (such as most LEDs), which do not attract insects and which should be directed downwards.</p> <ul style="list-style-type: none"> - An ECO should be present during construction to ensure compliance as well as ensure that any affected fauna can be removed to safety. - Any active burrows within the footprint should be checked for fauna before construction commences and should it not be possible to adjust the footprint to avoid such features, then the resident fauna should be relocated or excluded from the burrows so that they are not impacted by construction activities. - All construction vehicles should adhere to a low speed limit (30 km/h) to avoid collisions with susceptible species such as snakes and tortoises. - Regular dust suppression during construction, especially along access roads which are used frequently. - No activity should be allowed at the site between sunset and sunrise. - Any dangerous fauna (snakes, scorpions etc.) that are encountered during construction should not be handled or molested by the construction staff and the ECO or other suitably qualified persons should be contacted to remove the animals to safety. - Holes and trenches should not be left open for extended periods of time and should only be dug when needed for immediate construction. Trenches that may stand open for some days, should have places where the loose material has been returned to the trench to form an escape ramp present at regular intervals to allow any fauna that fall in to escape.
Indirect impacts:			
None identified.			
Cumulative impacts:			
None Identified			
Surface Water	Direct impacts:		
	Construction Lay-down Area Potential Impacts: Drainage Line and Watercourse Riparian Habitat Degradation	Medium Negative	<ul style="list-style-type: none"> - Seasonal scheduling of the construction process: It is important that wherever possible construction activities be scheduled to take place over the dry winter season when there is little rainfall and flows are low - Location of the lay-down area: The location of the lay-down area is not to be within 100m of a drainage line, watercourse or the associated buffer zone. All materials, machinery and vehicles are to be kept in a designated area that is located outside and at least 100m away from the identified surface water resources and the associated buffer zones. - Preventing Fire Risks to Wetlands and People - Operational fire extinguishers are to be available in the case of a fire emergency. Given the dry seasons that the study site experiences, it is recommended that a fire management and emergency plan compiled by a suitably qualified health and safety officer be compiled and implemented for the proposed development.
	Degradation and removal of wetland and associated	High Negative	<ul style="list-style-type: none"> - Obtaining Relevant Authorisations and Licenses – Before any construction or removal of soils and vegetation in the delineated wetlands and riparian habitats is undertaken, the relevant water use license and environmental authorisation

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Activity	Impact summary	Significance	Proposed mitigation
	buffer zone soils and vegetation		<p>is to be obtained and conditions adhered to.</p> <ul style="list-style-type: none"> - Preventing Physical Degradation of Wetlands – A single access route or “Right of Way” (RoW) is to be established to the desired construction area in the wetlands and/or riparian habitat. The width of the RoW must be limited to the width of the vehicles required to enter the wetland (no more than a 3m width). An area around the location where the existing towers are to be removed will be required. This too must be limited to the smallest possible area (no bigger than 20m²) to prevent unnecessary degradation. - Limiting Removal and Preserving Excavated Soils – Where foundations for the proposed power line structures are to be placed in the wetlands, a 30cm topsoil layer is to be stripped and stockpiled for the post-construction rehabilitation process. All excavated topsoils should be stockpiled separately from subsoils so that it can be placed back in the correct order for rehabilitation purposes. Usually, wetland soils are inappropriate to provide suitably stable infill and often need to be removed and replaced by imported soils of a suitable grade. Wetland soils must only be removed if absolutely required if this is the case. Any of the removed soils and vegetation that are not required should be taken to a registered landfill site that has sufficient capacity to assimilate the spoil. The topsoil is to be used for rehabilitation purposes and should not be removed unless there is surplus that cannot be utilised, in which case excessive topsoils be used in other areas where required. It is important to note that when the soils are reinstated, the sub soils are to be backfilled first, followed by the topsoil. The topsoil contains a natural seedbank from which the affected wetland can naturally rehabilitate. - Where the soils are excavated from the sensitive areas, it is preferable for them to be stockpiled adjacent to the excavation pit to limit vehicle and any other movement activities around the excavation areas. These soil stockpiles should be protected from wind and water erosion. This can be done by using a suitable cover to prevent exposure to wind and rain elements. - Preventing Pollution Impacts – Cement mixing is to take place over a bin lined surface or alternatively in the load bin of a vehicle to prevent the mixing of cement with the soil of the wetland. Preferably however, this should be done outside of the wetland and transported in. Importantly, no mixing of cement directly on the surface is allowed in the sensitive wetland and RoW areas. All accidental spills must be cleaned up and removed immediately from the wetland. - Protection of Stockpiled Soils – Stockpiled soils will need to be protected from wind and water erosion. Stockpiled soils are not to exceed a 2m height and are to be bunded by suitable materials. Stacking bricks (approximately 40cm high) around the stockpiled soils can be adopted. Alternatively, wooden planks (also approximately 40cm height) pegged around the stockpiled soils can be used. - Limiting use of Construction Vehicles – When stringing of the proposed power lines takes place through the wetland, it is to be undertaken by hand. Vehicles must not be used for this exercise in order to limit compaction impacts to the soils of the wetland and riparian habitats.

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Activity	Impact summary	Significance	Proposed mitigation
			<ul style="list-style-type: none"> - Rehabilitation of RoW areas – The affected RoW areas in the wetlands must be re-instated with the wetland soil that was initially excavated. Additionally, the affected areas must be levelled, or appropriately sloped and scarified to loosen the soil and allow seeds contained in the natural seed bank to re-establish. Preferably scarification is to take place before the spring and summer rainy season and not in the dry season. De-weeding once every three months for a year will need to take place to allow natural species to establish sufficiently.
	Degradation Impacts: stringing of power lines through surface water resources	Low Negative	<ul style="list-style-type: none"> - Preventing Vehicle Degradation Impacts: Previously, recommendations to prohibit vehicle access into wetlands must be upheld. For the stringing process specifically, stringing of the power lines must be undertaken by hand with the fewest possible workers allowed to cross through the wetlands, to limit trampling impacts. Once this has been undertaken, access must be strictly prohibited in the highly sensitive areas unless a RoW has been established allowing limited access during the construction phase only. The ECO must be on site to observe the stringing process through the surface water resources to ensure that potential impacts are minimised and where required, adequate mitigation measures to address impacts are undertaken.
	Human Degradation Impacts: Surface Water Resource Fauna and Flora Physical Degradation	Medium negative	<ul style="list-style-type: none"> - Minimising Human Physical Degradation of Highly Sensitive Areas - Construction workers are only allowed in designated RoW construction areas and not into the surrounding wetland systems. The RoW areas are to be clearly demarcated and no access beyond these areas into wetland is to be allowed. - Preventing Loss or Harm to Wetland Fauna and Flora - No animals on the study site are to be hunted, captured, trapped, removed, injured, killed or eaten. Should any party be found guilty of such an offence, stringent penalties should be imposed. - Preventing the Usage of Wetlands for Sanitation Purposes - No “long drop” or chemical toilets are allowed in any surface water features or their applicable buffers. These must be in designated areas within the construction site. Suitable temporary chemical sanitation facilities are to be provided. Temporary chemical sanitation facilities must be placed at least 100 meters from the wetland. Temporary chemical sanitation facilities must be placed over a bunded or a sealed surface area and adequately maintained to prevent pollution impacts. - Preventing Water Extraction from Wetlands - No water is to be extracted unless a water use license is granted for specific quantities.
	Service Road Establishment and Subsequent Vehicle Degradation Impacts to Riparian Habitats	Medium Negative	<ul style="list-style-type: none"> - Roads must not be planned through wetlands. Alternative routes must be planned and established that circumvent wetlands completely. - Minimising Vehicle Damage to the Wetland – Potential impacts can be avoided with the utilisation of existing roads adjacent to the surface water resources where prevalent. Where no service / access roads are available and new roads will be required inside the wetland, it is recommended that the service road plan be submitted to the relevant wetland specialist as well as environmental (DEA) and water departments (DWA) for final approval prior to

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Activity	Impact summary	Significance	Proposed mitigation
			<p>implementation. Importantly, this can be averted where roads are established around and outside the wetlands and riparian habitats.</p> <ul style="list-style-type: none"> - Should the service roads in and through the wetland be approved, it is recommended that a layer of biddum / geotextile be laid down across the RoW first and then a gravel base laid on top for the service road. This material will not erode away after rainfall events and can provide a relatively solid foundation when surface water accumulates. Use of these materials can also assist with reducing potential storm water run-off impacts. However, this measure is only to be used where service roads enter or route along the out edges of the wetlands and riparian habitats. - Where a service road needs to be routed through a wetland, more appropriate structures may be necessary depending on the wetland in question. Wetlands vary in hydrological characteristics and therefore may require more permanent structures (such as culvert bridges etc.). Input from a suitably qualified wetland specialist must be obtained in consultation with an engineer and sent to the DEA and DWA for final approval prior to implementation. Ideally, this information should feed into the wider environmental authorisation and water use license process for the proposed power line. - Service roads will have to be regularly monitored and checked for erosion. Monitoring should be conducted on a weekly to monthly basis. Moreover, after short or long periods of heavy rainfall or after long periods of sustained rainfall, roads will need to be checked for erosion. Where erosion begins to take place, this must be dealt with immediately to prevent erosion damage to the wetland. - Should large scale erosion occur, a rehabilitation plan will be required. Specialist input with regards to the assessment of the degree of erosion, reporting and recommendations from a suitably qualified wetland specialist must be obtained in this respect.
Indirect impacts:			
	<p>Vehicle and Machinery Impacts: Drainage Line and Watercourse Compaction and Degradation</p>	<p>Medium Negative</p>	<ul style="list-style-type: none"> - Preventing Physical Degradation of Wetlands – The wetland and the associated buffer zone are to be designated as “highly sensitive” and any impact must be limited to the minimum possible extent where construction is to take place in the wetland. - Construction workers are only allowed in the servitude area of the proposed power lines and not into the surrounding surface water resource system. The required construction areas in the wetland and the associated buffer zones are to be clearly demarcated and no access beyond these areas is to be allowed. - The width of the RoW must be limited to the width of the vehicles required to enter the wetland (no more than a 3m width). The number and type of permissible vehicles or machinery into or near to the sensitive areas must be limited to the bare minimum. Preferably light vehicles are to be utilised where possible. - Preventing Soil and Wetland Contamination - All vehicles and machinery are to be checked for oil, fuel or any other fluid leaks before entering the construction areas. All

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Activity	Impact summary	Significance	Proposed mitigation
			<p>vehicles and machinery must be regularly serviced and maintained before being allowed to enter the construction RoW within the highly sensitive areas. No fuelling, re-fuelling, vehicle and machinery servicing or maintenance is to take place in the sensitive areas. The construction site is to contain sufficient safety measures throughout the construction process. These include, but are not limited to, oil spill kits and fire extinguishers. Fuel, oil or hazardous substances storage areas must be bunded to prevent oil or fuel contamination of the ground and/or nearby surface water resource or associated buffer zone.</p> <ul style="list-style-type: none"> - Prevention of Hazardous Materials in Wetlands - No hazardous materials are to be stored in or brought into the sensitive areas. Should a designated storage area be required, the storage area must be placed at the furthest location from the sensitive areas. Appropriate safety measures as stipulated above must be implemented.
	Erosion, Increased Run-off and Sedimentation to Surface Water Resources	Low Negative	<ul style="list-style-type: none"> - Preventing Increased Run-off, Erosion and Sedimentation Impacts. Vegetation clearing should take place in a phased manner, only clearing the areas that will need to be constructed on immediately. Vegetation clearing must not take place in areas where construction is to only take place in the distant future. Vegetation must not be completely removed and must be undertaken according to standard Eskom vegetation clearance standards and policies where required. - Adequate structures must be in place (temporary or permanent where necessary) to deal with run-off and sediment volumes as well as control erosion. The use of silt fencing and/or sandbags or hessian "sausage" nets should be used to prevent erosion in susceptible construction areas. - All impacted areas must be adequately sloped to prevent the onset of erosion. These erosion measures must be on hand during the construction phase. In the case of bare sloped areas, sandbags and silt fences, spaced at regular intervals, will need to be installed.
	Vehicle Degradation Impacts: stringing of power lines through surface water resources	Low negative	<ul style="list-style-type: none"> - Preventing Vehicle Degradation Impacts: Previously, recommendations to prohibit vehicle access into wetlands must be upheld. For the stringing process specifically, stringing of the power lines must be undertaken by hand with the fewest possible workers allowed to cross through the wetlands, to limit trampling impacts. Once this has been undertaken, access must be strictly prohibited in the highly sensitive areas unless a RoW has been established allowing limited access during the construction phase only. The ECO must be on site to observe the stringing process through the surface water resources to ensure that potential impacts are minimised and where required, adequate mitigation measures to address impacts are undertaken.
Cumulative impacts:			
None identified.			
Direct Impacts			
None identified.			
Indirect Impacts			
Geographical and physical Aspects	Soil erosion through vegetation	Low negative	Refer to EMPr attached in Appendix G: <ul style="list-style-type: none"> - All vehicles to remain within the designated vehicle tracks; and

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Activity	Impact summary	Significance	Proposed mitigation
	clearance and soil compaction by heavy duty construction vehicles		<ul style="list-style-type: none"> - Minimum / no movement in areas already eroded.
	Contamination of soils through indiscriminate disposal of construction waste and accidental spillage of petroleum products.	Low negative	Refer to EMP in Appendix G: <ul style="list-style-type: none"> - Storage of any materials shall not take place within 32m of any watercourses or sensitive environments. - Fuel, oil and any other hazardous substances and harmful materials shall be stored in suitable containers within adequately bunded areas (with 110% of the capacity of the volume of the container) in a dry, secure environment, with concrete or sealed flooring. - Material Safety Data Sheets shall be kept for all hazardous materials and substances and a copy of the Material Safety Data sheets shall be made available to all workers to ensure that the required safe handling and necessary precautions are taken when using the materials. - The PC will ensure that materials storage facilities are cleaned/ maintained on a regular basis, and that leaking containers are disposed of in a manner that allows no spillage onto the bare soil or surface water.
	Cumulative Impact		
	None identified.		
Agricultural Potential and Soils	Direct impacts:		
	Loss of agricultural land and / or production as a result of the proposed substation construction	Medium Negative (Substation Alternative)	<ul style="list-style-type: none"> - Avoid active cultivated land by building in the centre of the assessment area, which is characterised by low value agricultural land (grazing land). - Due to the overarching site characteristics and the nature of the proposed development viable mitigation measures are limited and will most likely revolve around erosion control: <ul style="list-style-type: none"> - Clearing activities should be kept to a minimum. - In the unlikely event that heavy rains are expected activities should be put on hold to reduce the risk of erosion. - If additional earthworks are required, any steep or large embankments that are expected to be exposed during the 'rainy' months should either be armoured with fascine like structures. - If earth works are required then storm water control and wind screening should be undertaken to prevent soil loss from the site
	Loss of agricultural land and / or production as a result of the proposed substation construction	Medium Negative (Power line Alternatives)	<ul style="list-style-type: none"> - Interact with impacted landowners to discuss where they would ideally like to see the power lines situated on their property to have the least impact on their farming practices, the negotiation phase should form part of the final survey / line route selection. - Employ a low impact routing to avoid / skirt high value agricultural land. This is particularly important for the various agricultural areas identified. - The utilisation of optimal tower designs can further reduce the potential impacts. - Attempt to place towers on the edge of existing agricultural areas and span active agricultural fields as far as possible. Following existing roads and utilising the edge of road servitudes is highly recommended due to the existing impacts associated with these areas. - Ensure adequate compensation is paid to land owners

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Activity	Impact summary	Significance	Proposed mitigation
			where necessary. - Employ erosion control: - Clearing activities should be kept to a minimum. - In the unlikely event that heavy rains are expected, activities should be put on hold to reduce the risk of erosion. - If additional earthworks are required, any steep or large embankments that are expected to be exposed during the 'rainy' months should be armoured with fascine like structures. - If earth works are required then storm water control and wind screening should be undertaken to prevent soil erosion.
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	None identified.		
Avifauna Impacts	Direct impacts:		
	Collision of birds with overhead power line cables, in particular the earth wire.	High negative	- An avifaunal walk through study will be required once tower positions are final in order to identify the exact spans of line posing a collision risk. - High risk sections of line should be fitted with the best Eskom approved anti bird collision line marking device available at the time of construction. These devices should be installed on the earth wire according to Eskom standards. These sections of line have been identified by this report. - It will be important for Eskom to report all bird collisions detected during maintenance line patrols, so that the significance of this impact and the effectiveness of mitigation can be accurately evaluated.
	Electrocution of birds on pylons/towers and in substation yard	High negative	- It is essential that the monopole structure be used with an Eskom Bird Perch to provide safe perching space for large birds well above the dangerous hardware. There is a likelihood of large raptors perching on the pylons occasionally. - It will be important for Eskom to report all bird electrocutions detected during maintenance line patrols, so that the significance of this impact and the effectiveness of mitigation can be accurately evaluated. - Refer to the Eskom bird policies and guidelines.
	Indirect impacts:		
	Disturbance of birds in the area during construction of the proposed project	Medium to Low Negative	- The avifaunal walk through should identify any breeding sensitive species along the servitudes and develop case specific management measures to reduce the effects of disturbance at such nests. - General environmental best practices should suffice for reducing the general disturbance as far as possible. These include; strict management of staff, vehicles and machinery on site; and completing construction within the shortest possible time.
	Destruction and alteration of habitat available to birds in the area during construction of the proposed project	Medium – High Negative	- All of the natural vegetation along the servitude and on the substation site should be protected as far as possible, although it is acknowledged that some removal is inevitable. It is recommended that vegetation removal is kept to an absolute minimum however. - In addition to the above exercise, general environmental best practices should suffice for reducing the disturbance of vegetation as far as possible. These include; strict management of staff, vehicles and machinery on site

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Activity	Impact summary	Significance	Proposed mitigation
	Cumulative impacts:		
	None Identified		
Heritage	Direct impacts:		
	Impact on Two cemeteries and one Later Iron Age site occurs on the footprint	High Negative	Not applicable in this instance as it would be possible to shift the power lines slightly in order to accommodate heritage conservation principles. However, the KwaZulu-Natal Heritage Act requires that any operations exposing archaeological and historical residues should cease immediately pending an evaluation by the heritage authorities.
	Indirect impacts:		
	None Identified. No heritage sites occur on or near footprint		
	Cumulative impacts:		
None Identified. No heritage sites occur on or near footprint			
Visual	Direct Impacts		
	Large construction vehicles and equipment during the construction phase may change the visual character of the study area and expose sensitive receptors to visual impacts associated with the construction phase.	Low Negative	<ul style="list-style-type: none"> - Locate construction camp and storage areas in zones of low visibility i.e. behind tall trees or in lower lying areas. - Minimise vegetation clearing and rehabilitate cleared areas as soon as possible. - Maintain a neat construction site by removing rubble and waste materials regularly. - Make use of existing gravel access roads where possible.
	Indirect impacts:		
	None Identified		
	Cumulative impacts:		
Change to the visual character of the surrounding area and visual impact on potentially sensitive visual receptors that may perceive the substation to be an unwelcome intrusion.	Medium Negative (Substation Alternative)	<ul style="list-style-type: none"> - Locate the substation as far away from sensitive receptor locations as possible. - Where possible, locate the substation behind tall trees so that it is less visible from local homesteads. 	
	Medium Negative (Power Line Alternatives)	<ul style="list-style-type: none"> - Align the power lines as far away from potentially sensitive receptor locations as possible. - In order to consolidate the visual impact, align the two power lines so that they run parallel to each other within the same route corridor alternative. - Where possible, align the power lines to run parallel to linear impacts such as the existing railway line. - Where possible, avoid crossing areas of higher elevation, especially ridges, koppies or hills. - Align the power lines within or behind the tall commercial forestry plantation, where possible. 	
Socio-economic	Direct Impacts		
	Positive economic impacts as a result of higher coal export tonnage, as well	High Positive	N/A: Mitigation not required.

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Activity	Impact summary	Significance	Proposed mitigation
	as temporary and permanent employment opportunities, thereby contributing positively to the expansion and strengthening of local economic activities.		
	Indirect impacts:		
	None identified.		
	Cumulative impacts:		
	None identified.		
Dust	Direct impacts:		
	None identified.		
	Indirect impacts:		
	Dust impacts on surrounding environment associated with construction activities	Low negative	<ul style="list-style-type: none"> - Generation of dust shall be minimised and dust nuisance for the surrounding areas shall be kept to a minimum wherever possible. - Dust from exposed soil surfaces shall be minimised at all times, only using water spray during extremely windy conditions - Reasonable measures must be undertaken by the contractor to ensure that any exposed areas and material stockpiles are adequately protected against the wind. - Dust screens of a suitable height should be erected wherever required and possible. - All exposed surfaces should be minimised in terms of duration of exposure to wind and stormwater.
	Cumulative impacts:		
	None identified.		
Noise	Direct impacts:		
	None identified.		
	Indirect impacts:		
	Noise impacts on surrounding environment associated with construction activities (Construction vehicles and equipment)	Low Negative	<ul style="list-style-type: none"> - The contractor shall adhere to the local by-laws and regulations regarding the noise and associated hours of operations. - The contractor shall limit noise levels (e.g. install and maintain silencers on machinery). The provisions of sans 1200a sub-clause 4.1 regarding "built-up" area shall apply to all areas within audible distance of residents whether in urban, peri-urban or rural areas. - Construction and demolition activities generating output of 85db or more, shall be limited to normal working hours and not allowed during weekends. - Should the contractor need to work outside normal working hours, any affected individuals shall be informed prior to the work taking place. - No amplified music shall be allowed on site.
	Cumulative impacts:		
	None identified.		
Waste	Direct impacts:		
	None identified.		
	Indirect impacts:		
	Generation of	Medium	Waste management mitigation measures as detailed in the EMPr

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Activity	Impact summary	Significance	Proposed mitigation
	additional waste/ litter and building rubble/hazardous material during the construction phase	Negative	(attached in Appendix G) includes: <ul style="list-style-type: none"> - Solid waste (construction waste and builders rubble) will be collected by independent contractors and disposed of at the registered licensed municipal landfill site in with proof of safe disposal as required. - The contractor shall ensure that all litter is collected from the work area. Similarly, all bins shall be emptied regularly and the waste disposed of at a permitted landfill site. - The contractor shall ensure that the construction site, working and eating areas are maintained in a clean, hygienic and orderly state. - Separate bins should be provided for various materials to facilitate recycling. The bins should have liner bags for easy control and safe disposal of waste. - The excavation and use of rubbish pits on site is forbidden. - The burning of waste is forbidden. - All vehicles and equipment must be maintained in a good condition in order to minimise the risk of leakage and possible contamination of the soil or storm water by fuels, oils and hydraulic fluids. - Sufficient quantities of suitable hydrocarbon absorption or remediation materials must be present on site at all times.
Cumulative impacts:			
None identified.			
No-go option			
Socio-economic	Direct impacts:		
	Socio - Economic	High Negative	Negative socio-economic impacts as a result of inadequate supply of electricity to the Transnet railway system thereby preventing an increased export tonnage of coal. This will prevent job creation in the area and hinder South Africa's economic growth in the coal export sector
	Indirect impacts:		
	None identified.		
Cumulative impacts:			
None identified.			

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

Please note: Due to the generic nature of the study area and the fact that the routes run in close proximity to each other (overlapping in part) for large portions of the alignments the impacts for each proposed alternative are relatively equal. A complete impact assessment in terms of Regulation 22(2)(i) of GN R.543 is included in Appendix F.

2. ENVIRONMENTAL IMPACT STATEMENT

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

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Substation Alternative (Preferred alternative)

Botanical	The proposed substation area with a radius of 0.5 km is on the eastern edge of Sheepmoor village. The area has highly disturbed, degraded Vulnerable Eastern Highveld Grassland with a Black Wattle infestation (<i>Acacia mearnsii</i> , a Category 2 plant invader) in part of the area. Sensitive areas are present. The stream and wetland should be avoided (Vulnerable Eastern Temperate Freshwater Wetlands). No threatened plant species or species of conservation concern were found in this area. The more disturbed parts closer to the village are suitable for a substation and will have minimal impact on the natural vegetation. The erosion potential is low to moderate in the area.
Floral Habitat	It is recommended that the Sheepmoor Substation Alternative and Line Alternative 2A be considered as the preferred alternatives in order to prevent highly significant impacts on the receiving floral environment. Placement of infrastructure, especially Line Alternatives 1 and 2B, within areas of increased floral diversity will result in permanent removal of indigenous species.
Fauna	The site is considered relatively sensitive in general and there are several features of high significance for fauna along Alternative 1 which should preclude this as viable alternative. There is an extensive area of wetlands associated with the Sandspruit River that is likely to be of significance for all faunal groups as well as being sensitive as a habitat in its' own right. In terms of the other three alternatives, there is not a lot of difference between the routes, but the greater extent of wetlands along Alternative 2A and Alternative 2B compared to Alternative 2C means that the latter is identified as the preferred route alternative. The substation site is located within a previously disturbed site and as a result is not considered sensitive. As a result, the majority of the impact associated with the development will result from the power line.
Surface Water	Additionally, the proposed substation location and 500m radius assessment revealed only (1) surface water resource, namely a river and associated riparian corridor, therefore the proposed location of the substation is deemed as favourable.
Agricultural Potential and Soils	The centre of substation assessment area influences unimproved grazing land and natural veld.
Heritage	A cultural heritage survey of the proposed Coal-Link Project at Sheepmoor, Mpumalanga Province identified three heritage features on the identified footprint. These include two Cemeteries and one Later Iron Age Site. It is suggested that the developer shift the trajectory for the proposed substation and associated power lines at least 30m in the opposite direction from the relevant heritage sites in order to allow for a buffer zone of at least 40m. Mitigation would be impractical and it is not supported by this study. There is no archaeological reason why the proposed development may not proceed on the remainder of the footprint as planned.
Avifauna	The proposed position for the Sheepmoor Substation is acceptable from an avifaunal perspective. The area is highly disturbed already and the vegetation is degraded and invaded by alien species.
Visual	The Visual Impact Assessment conducted for the Sheepmoor TSS has demonstrated that the study area has a rural visual character, which can be regarded as scenic where natural intact vegetation. The study area is not typically valued or utilised for its natural scenic value and therefore other than the N2 national road, no other visually sensitive receptors were identified during the fieldwork.

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Socio-Economic	N/A
Geotechnical	The site is underlain by transported and residual dolerite soils. It is possible that variations in the subsoil conditions may be encountered elsewhere on site during construction. These variations must be taken into consideration during on site supervision and construction. For this reason it is important that WorleyParsons RSA (Pty) Ltd be appointed to evaluate these variations and the effect on the development so that unnecessary expense and delays can be avoided.

Option 1: Power line Alternative 1 (Favourable Alternative)

Botanical	Several good quality streams, wetlands and associated vegetation cross this corridor (Vulnerable Eastern Temperate Freshwater Wetlands). Vulnerable Eastern Highveld Grassland covers most of the corridor, except towards waypoint 11 and between waypoints 11 and 12, where Endangered Wakkerstroom Montane Grassland is found. The corridor is more sensitive between waypoints 7 and 8 where Eastern Highveld Grassland with moderate species richness is found. Sensitivity is also higher between waypoints 9 and 10 and towards waypoint 11 on the eastern side of the centre-line, where Eastern Highveld Grassland with moderate species richness is found. Towards waypoint 11 and in the vicinity of this waypoint, Wakkerstroom Montane Grassland has moderate species richness, which increases the sensitivity in this area. No threatened plant species or species of conservation concern were found in this corridor. Disturbance due to overgrazing, over-burning, alien invader trees and the edge effects of roads is relatively high in this corridor. The erosion potential is low to moderate along most of the corridor in areas occupied by Eastern Highveld Grassland and low to very high where steep slopes occur and where Wakkerstroom Montane Grassland is present. Existing tracks and roads are present in this corridor, which make access easier for installing the power-lines and removes the need for new access that will have significant negative impacts on the two vegetation types.
Floral Habitat	It is recommended that the Sheepmoor Substation Alternative and Line Alternative 2A be considered as the preferred alternatives in order to prevent highly significant impacts on the receiving floral environment. Placement of infrastructure, especially Line Alternatives 1 and 2B, within areas of increased floral diversity will result in permanent removal of indigenous species.
Fauna	The site is considered relatively sensitive in general and there are several features of high significance for fauna along Alternative 1 which should preclude this as viable alternative. There is an extensive area of wetlands associated with the Sandspruit River that is likely to be of significance for all faunal groups as well as being sensitive as a habitat in its' own right. In terms of the other three alternatives, there is not a lot of difference between the routes, but the greater extent of wetlands along Alternative 2A and Alternative 2B compared to Alternative 2C means that the latter is identified as the preferred route alternative. The substation site is located within a previously disturbed site and as a result is not considered sensitive. As a result, the majority of the impact associated with the development will result from the power line.
Surface Water	There are a total of ten (10) watercourses that can be found along Alternative 1. These consist of four (4) hillslope seep wetlands, three (3) channelled valley-bottom wetlands one (1) unchannelled valley-bottom wetland, and two (2) rivers with associated riparian corridors, of which only three (3) watercourses will need to be

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	spanned. Of these, one (1) channelled valley-bottom is too wide to be spanned, and thus a tower is most likely required to be constructed within the wetland. Over and above this, most wetlands can be avoided by routing the proposed power line around the wetlands. The prevailing landscape in this alternative is used primarily for pastoral land and contains existing roads, which the proposed alternative can route along. Re-routing the alternative along the existing roads would minimise possible impacts, and thus this alternative is considered favourable due to the lesser likelihood of impacts on watercourses in the broader area.
Agricultural Potential and Soils	Route crosses low value agricultural land (natural veld, unimproved grazing and scrub plantation). The findings of this assessment indicate that proposed Power Line Alternatives 1, 2A and 2B share virtually similar agricultural potential and value and are all suitable to accommodate the proposed development. Alternative 2C contains a band of moderate agricultural land which should be avoided by utilising an alternative corridor. <u>Although longer Alternative 1 is the preferred option as it influences the land with the lowest agricultural value.</u>
Heritage	A cultural heritage survey of the proposed Coal-Link Project at Sheepmoor, Mpumalanga Province identified three heritage features on the identified footprint. These include two Cemeteries and one Later Iron Age Site. It is suggested that the developer shift the trajectory for the proposed substation and associated power lines at least 30m in the opposite direction from the relevant heritage sites in order to allow for a buffer zone of at least 40m. Mitigation would be impractical and it is not supported by this study. There is no archaeological reason why the proposed development may not proceed on the remainder of the footprint as planned.
Avifauna	The Alternative 1 is acceptable as it follows a railway line and then a road for most of its route. These are existing disturbances so this is an advantage in terms of reducing risk of bird collision and reducing the need for construction of new roads and consequent removal or alteration of natural vegetation. A disadvantage to this route is that it traverses some high ground close to where it joins the existing line in the south. This high altitude grassland is more sensitive than the lower vegetation, and placing the line higher in the topography also increases the risk of certain bird species colliding with or perching on the line. In general it would be preferred that the two lines are placed adjacent to each other rather than in separate corridors. This is because grouping the impacts in one corridor would be preferred, and multiple lines are believed to be more visible to birds thereby reducing the collision risk. Overall then the order of preference of the above seven options is as follows: Option 2 > Option 1 > Option 5. Options 3, 4, 6 and 7 should not be considered further.
Visual	<ul style="list-style-type: none"> - Wide-open vistas would typically be experienced as the alternative traverses relatively flat terrain where short natural vegetation still prevails. As such, the power line alternative would be highly visible from the N2. - As the alternative runs toward the proposed Sheepmoor TSS, the visual impact would be limited as the power line alternative is aligned parallel to an existing railway line. In this way the visual impact would be consolidated and the visual contrast would be reduced.
Socio-Economic	N/A

Option 2: Power Line Alternative 2A (Preferred Alternative)

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Botanical	<p>Numerous good quality streams, wetlands and associated vegetation are present in this corridor (Vulnerable Eastern Temperate Freshwater Wetlands), which is covered largely by Eastern Highveld Grassland together with small areas of Wakkerstroom Montane Grassland. Disturbance due to overgrazing, over-burning, alien invader trees and the edge effects of roads is relatively high in this corridor, and the grassland is generally of moderate to low species richness. More sensitive areas of moderate species richness from waypoints 16 to 21 are present. No threatened plant species or species of conservation concern were found in this corridor. The erosion potential is low to moderate along most of the corridor in areas occupied by Eastern Highveld Grassland and low to very high where steep slopes occur and where Wakkerstroom Montane Grassland is present. Existing tracks and roads are present through most of the corridor, which make access easier for installing the power-lines and removes the need for new access that will have significant negative impacts on the two vegetation types.</p>
Floral Habitat	<p>It is recommended that the Sheepmoor Substation Alternative and Line Alternative 2A be considered as the preferred alternatives in order to prevent highly significant impacts on the receiving floral environment. Placement of infrastructure, especially Line Alternatives 1 and 2B, within areas of increased floral diversity will result in permanent removal of indigenous species.</p>
Fauna	<p>The site is considered relatively sensitive in general and there are several features of high significance for fauna along Alternative 1 which should preclude this as viable alternative. There is an extensive area of wetlands associated with the Sandspruit River that is likely to be of significance for all faunal groups as well as being sensitive as a habitat in its' own right. In terms of the other three alternatives, there is not a lot of difference between the routes, but the greater extent of wetlands along Alternative 2A and Alternative 2B compared to Alternative 2C means that the latter is identified as the preferred route alternative. The substation site is located within a previously disturbed site and as a result is not considered sensitive. As a result, the majority of the impact associated with the development will result from the power line.</p>
Surface Water	<p>There are a total of eight (8) watercourses that can be found along Alternative 2. These consist of seven (7) channelled valley-bottom wetlands and one (1) riparian corridor, of which five (5) will need to be spanned. Direct and indirect impacts on these surface water resources may result during the construction phase. The five (5) wetlands requiring to be spanned are not very wide, and can be spanned at the narrowest point. This alternative is preferred due to the reduced possibility of direct and indirect impacts on the watercourses in comparison to all other alternatives.</p>
Agricultural Potential and Soils	<p>Route crosses low value agricultural land (natural veld, unimproved grazing and small subsistence fields) with pockets of moderate value agricultural land which can be avoided. The findings of this assessment indicate that proposed Power Line Alternatives 1, 2A and 2B share virtually similar agricultural potential and value and are all suitable to accommodate the proposed development. Alternative 2C contains a band of moderate agricultural land which should be avoided by utilising an alternative corridor. <u>Although longer Alternative 1 is the preferred option as it influences the land with the lowest agricultural value.</u></p>
Heritage	<p>A cultural heritage survey of the proposed Coal-Link Project at Sheepmoor, Mpumalanga Province identified three heritage features on the identified footprint. These include two Cemeteries and one Later Iron Age Site. It is suggested that the developer shift the trajectory for the proposed substation and associated power lines at least 30m in the opposite direction from the relevant heritage sites in order</p>

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	to allow for a buffer zone of at least 40m. Mitigation would be impractical and it is not supported by this study. There is no archaeological reason why the proposed development may not proceed on the remainder of the footprint as planned.
Avifauna	<p>On the Southern Circuit the 2A route is preferred as it more or less follows the road once it is south of the R29. The other two options are not preferred as they pass through less developed areas. It is strongly recommended that 2B and 2C are not developed. Overall the southern circuit or Alternative 2 is more preferred as it does not traverse the high ground mentioned above.</p> <p>In general it would be preferred that the two lines are placed adjacent to each other rather than in separate corridors. This is because grouping the impacts in one corridor would be preferred, and multiple lines are believed to be more visible to birds thereby reducing the collision risk.</p> <p>Overall then the order of preference of the above seven options is as follows: Option 2 > Option 1 > Option 5. Options 3, 4, 6 and 7 should not be considered further.</p>
Visual	<ul style="list-style-type: none"> - Hilly terrain to the west and east of the alternative would partially constrain views of the power lines from the surrounding area. In addition the power lines traverses lower lying terrain thus reducing the visibility. - The commercial forestry plantations on the northern and southern side of the N2 would partially screen views of the power lines from the N2.
Socio-Economic	N/A

Option 3: Power Line Alternative 2B (Not Preferred Alternative)

Botanical	<p>Numerous good quality streams, wetlands and associated vegetation are present in this corridor (Vulnerable Eastern Temperate Freshwater Wetlands), which is covered with Vulnerable Eastern Highveld Grassland and Endangered Wakkerstroom Montane Grassland. Out of the four corridors, this corridor has the highest presence of Endangered Wakkerstroom Montane Grassland. Disturbance is low and plant species richness is generally moderate, but high towards the end of the corridor, where Eastern Highveld Grassland (waypoints 33 - 34) and Wakkerstroom Montane Grassland (waypoints 34 - 35) are present. Threatened plant species or species of conservation concern may well be present in this corridor, although none were found. The erosion potential is low to moderate in areas occupied by Eastern Highveld Grassland and low to very high where steep slopes occur and where Wakkerstroom Montane Grassland is present. There are very few existing tracks in this corridor, which make access difficult for installing the power-lines. New access tracks will have to be made that will have significant negative impacts on the two sensitive vegetation types. This corridor should not be used because of the relatively undisturbed threatened vegetation types which are present.</p>
Floral Habitat	<p>It is recommended that the Sheepmoor Substation Alternative and Line Alternative 2A be considered as the preferred alternatives in order to prevent highly significant impacts on the receiving floral environment. Placement of infrastructure, especially Line Alternatives 1 and 2B, within areas of increased floral diversity will result in permanent removal of indigenous species.</p>
Fauna	<p>The site is considered relatively sensitive in general and there are several features of high significance for fauna along Alternative 1 which should preclude this as viable alternative. There is an extensive area of wetlands associated with the</p>

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	Sandspruit River that is likely to be of significance for all faunal groups as well as being sensitive as a habitat in its' own right. In terms of the other three alternatives, there is not a lot of difference between the routes, but the greater extent of wetlands along Alternative 2A and Alternative 2B compared to Alternative 2C means that the latter is identified as the preferred route alternative. The substation site is located within a previously disturbed site and as a result is not considered sensitive. As a result, the majority of the impact associated with the development will result from the power line.
Surface Water	There are a total of thirteen (13) watercourses that can be found along Alternative 2. These consist of five (5) channelled valley-bottom wetlands, four (4) hillslope seep wetlands, and four (4) unchannelled valley-bottom wetlands, of which eight (8) will need to be spanned. All wetlands are narrow enough to be spanned, and thus no towers would be expected to be placed within any wetlands. Due to high number of potential watercourses to be impacted, Alternative 3 is not preferred.
Agricultural Potential and Soils	Route crosses low value agricultural land (natural veld, unimproved grazing and small subsistence fields) with pockets of moderate value agricultural land which can be avoided. The findings of this assessment indicate that proposed Power Line Alternatives 1, 2A and 2B share virtually similar agricultural potential and value and are all suitable to accommodate the proposed development. Alternative 2C contains a band of moderate agricultural land which should be avoided by utilising an alternative corridor. <u>Although longer Alternative 1 is the preferred option as it influences the land with the lowest agricultural value.</u>
Heritage	A cultural heritage survey of the proposed Coal-Link Project at Sheepmoor, Mpumalanga Province identified three heritage features on the identified footprint. These include two Cemeteries and one Later Iron Age Site. It is suggested that the developer shift the trajectory for the proposed substation and associated power lines at least 30m in the opposite direction from the relevant heritage sites in order to allow for a buffer zone of at least 40m. Mitigation would be impractical and it is not supported by this study. There is no archaeological reason why the proposed development may not proceed on the remainder of the footprint as planned.
Avifauna	From an avifaunal perspective there is little difference between the habitats on the two substation sites. However the turn in power line route associated with each substation site differ significantly. The southern option or Alternative 2 is preferred from an avifaunal perspective as it requires significantly shorter length of power line to be constructed, with consequent lower risk to birds. In addition the southern route passes through grassland that is believed to be more degraded than that in the north, so destruction of habitat will also be less significant. Corridor 2B is slightly preferred over 2A. Overall then the order of preference of the alternatives is as follows: Both lines in Option 2A > Both lines in Option 2B > one line in each of Option 2A and 2B > both lines in Option 1A > Both lines in Option 1B > one line in each of 1A and 1B.
Visual	- Although the commercial forestry plantations on the southern side of the N2 would partially screen views of the power lines from the N2, the power line alternative traverses higher lying terrain which would increase its visibility.
Socio-Economic	N/A

Option 4: Power Line Alternative 2C (Not Preferred Alternative)

Botanical	Several good quality streams, wetlands and associated vegetation are present in
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	<p>this corridor (Vulnerable Eastern Temperate Freshwater Wetlands), which is covered largely by Eastern Highveld Grassland together with a small area of Wakkerstroom Montane Grassland. Disturbance due to overgrazing, over-burning and alien invader trees is relatively high in this corridor, and the grassland is generally of low species richness, although sensitive areas are present. No threatened plant species or species of conservation concern were found in this corridor. The erosion potential is low to moderate along most of the corridor in areas occupied by Eastern Highveld Grassland and low to very high where steep slopes occur and where Wakkerstroom Montane Grassland is present. Existing tracks are present through most of the corridor, which make access easier for installing the power-lines and removes the need for new access that will have significant negative impacts on the two vegetation types.</p>
Floral Habitat	<p>It is recommended that the Sheepmoor Substation Alternative and Line Alternative 2A be considered as the preferred alternatives in order to prevent highly significant impacts on the receiving floral environment. Placement of infrastructure, especially Line Alternatives 1 and 2B, within areas of increased floral diversity will result in permanent removal of indigenous species.</p>
Fauna	<p>The site is considered relatively sensitive in general and there are several features of high significance for fauna along Alternative 1 which should preclude this as viable alternative. There is an extensive area of wetlands associated with the Sandspruit River that is likely to be of significance for all faunal groups as well as being sensitive as a habitat in its' own right. In terms of the other three alternatives, there is not a lot of difference between the routes, but the greater extent of wetlands along Alternative 2A and Alternative 2B compared to Alternative 2C means that the latter is identified as the preferred route alternative. The substation site is located within a previously disturbed site and as a result is not considered sensitive. As a result, the majority of the impact associated with the development will result from the power line.</p>
Surface Water	<p>There are a total of fifteen (15) watercourses that can be found along Alternative 2C. These consist of two (2) riparian corridors, eight (8) channelled valley-bottom wetlands, and five (5) hillslope seep wetlands. This option contains the highest number of wetlands that could potentially be affected by the proposed development. However, potential impacts to some of the wetlands can be avoided by routing the power line away from the wetlands to avoid impacts. Despite this, this option contains seven (7) wetlands that will need to be spanned given that each occupies the width of the corridor. Due to high number of watercourses to be impacted, Alternative 4 is least preferred. Furthermore, where riparian corridors are to be spanned, vegetation clearance will take place, as per Eskom standard protocol.</p>
Agricultural Potential and Soils	<p>Route crosses band of cultivated land of moderate value that cannot be skirted or spanned. The findings of this assessment indicate that proposed Power Line Alternatives 1, 2A and 2B share virtually similar agricultural potential and value and are all suitable to accommodate the proposed development. Alternative 2C contains a band of moderate agricultural land which should be avoided by utilising an alternative corridor. <u>Although longer Alternative 1 is the preferred option as it influences the land with the lowest agricultural value.</u></p>
Heritage	<p>A cultural heritage survey of the proposed Coal-Link Project at Sheepmoor, Mpumalanga Province identified three heritage features on the identified footprint. These include two Cemeteries and one Later Iron Age Site. It is suggested that the developer shift the trajectory for the proposed substation and associated power</p>

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	lines at least 30m in the opposite direction from the relevant heritage sites in order to allow for a buffer zone of at least 40m. Mitigation would be impractical and it is not supported by this study. There is no archaeological reason why the proposed development may not proceed on the remainder of the footprint as planned.
Avifauna	<p>On the Southern Circuit the 2A route is preferred as it more or less follows the road once it is south of the R29. The other two options are not preferred as they pass through less developed areas. It is strongly recommended that 2B and 2C are not developed. Overall the southern circuit or Alternative 2 is more preferred as it does not traverse the high ground mentioned above.</p> <p>In general it would be preferred that the two lines are placed adjacent to each other rather than in separate corridors. This is because grouping the impacts in one corridor would be preferred, and multiple lines are believed to be more visible to birds thereby reducing the collision risk.</p> <p>Overall then the order of preference of the above seven options is as follows: Option 2 > Option 1 > Option 5. Options 3, 4, 6 and 7 should not be considered further.</p>
Visual	- The hilly terrain to the south of the N2 would partially constrain views of the power lines from western part of the study area. However, the power lines would be highly visible from the N2 in the eastern part of the study area due to the relatively flat terrain and short natural vegetation which prevails in this area.
Socio-Economic	N/A

Power Line Option 5: Combination of Alternative 1 and Alternative 2A (Technically Preferred Alternative)

Botanical	The same descriptions as given above apply here for both respective corridors, but in terms of localising and minimising negative impacts, it would be better for two power-lines to be erected in EITHER Corridor 1 OR 2A.
Floral Habitat	It is recommended that the Sheepmoor Substation Alternative and Line Alternative 2A be considered as the preferred alternatives in order to prevent highly significant impacts on the receiving floral environment. Placement of infrastructure, especially Line Alternatives 1 and 2B, within areas of increased floral diversity will result in permanent removal of indigenous species.
Fauna	The site is considered relatively sensitive in general and there are several features of high significance for fauna along Alternative 1 which should preclude this as viable alternative. There is an extensive area of wetlands associated with the Sandspruit River that is likely to be of significance for all faunal groups as well as being sensitive as a habitat in its' own right. In terms of the other three alternatives, there is not a lot of difference between the routes, but the greater extent of wetlands along Alternative 2A and Alternative 2B compared to Alternative 2C means that the latter is identified as the preferred route alternative. The substation site is located within a previously disturbed site and as a result is not considered sensitive. As a result, the majority of the impact associated with the development will result from the power line.
Surface Water	There are a total of eighteen (18) watercourses that can be found along Alternative 5. These consist of four (4) hillslope seep wetlands, ten (10) channelled valley-bottom wetlands, three (3) rivers with associated riparian corridors, and one (1) unchannelled valley-bottom wetland. Of these, a total of eight (8) watercourses will be required to be spanned. One (1) channelled valley-bottom is too wide to be

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	spanned, and thus a tower is most likely required to be constructed within the wetland. Due to the high number of potential watercourses to be impacted, Alternative 5 is not preferred.
Agricultural Potential and Soils	Route crosses low value agricultural land (natural veld, unimproved grazing and scrub plantation). Route crosses low value agricultural land (natural veld, unimproved grazing and small subsistence fields) with pockets of moderate value agricultural land which can be avoided. The findings of this assessment indicate that proposed Power Line Alternatives 1, 2A and 2B share virtually similar agricultural potential and value and are all suitable to accommodate the proposed development. Alternative 2C contains a band of moderate agricultural land which should be avoided by utilising an alternative corridor. <u>Although longer Alternative 1 is the preferred option as it influences the land with the lowest agricultural value.</u>
Heritage	A cultural heritage survey of the proposed Coal-Link Project at Sheepmoor, Mpumalanga Province identified three heritage features on the identified footprint. These include two Cemeteries and one Later Iron Age Site. It is suggested that the developer shift the trajectory for the proposed substation and associated power lines at least 30m in the opposite direction from the relevant heritage sites in order to allow for a buffer zone of at least 40m. Mitigation would be impractical and it is not supported by this study. There is no archaeological reason why the proposed development may not proceed on the remainder of the footprint as planned.
Avifauna	On the Southern Circuit the 2A route is preferred as it more or less follows the road once it is south of the R29. The other two options are not preferred as they pass through less developed areas. It is strongly recommended that 2B and 2C are not developed. Overall the southern circuit or Alternative 2 is more preferred as it does not traverse the high ground mentioned above. In general it would be preferred that the two lines are placed adjacent to each other rather than in separate corridors. This is because grouping the impacts in one corridor would be preferred, and multiple lines are believed to be more visible to birds thereby reducing the collision risk. Overall then the order of preference of the above seven options is as follows: Option 2 > Option 1 > Option 5. Options 3, 4, 6 and 7 should not be considered further.
Visual	Splitting the power lines between the two route alternatives would magnify the visual impact and expose more potentially sensitive farmsteads and other residents to visual impacts of the proposed power lines.
Socio-Economic	N/A

Option 6: Combination of Power Line Alternative 1 and Power Line Alternative 2B (Not preferred Alternative)

Botanical	The same descriptions as given above apply here for both respective corridors. This combination of corridors should not be used because of the sensitivity of Corridor 2B, as described above in this table. In terms of localising and minimising negative impacts, it would be better for two power-lines to be erected in Corridor 1.
Floral Habitat	It is recommended that the Sheepmoor Substation Alternative and Line Alternative 2A be considered as the preferred alternatives in order to prevent highly significant impacts on the receiving floral environment. Placement of infrastructure, especially Line Alternatives 1 and 2B, within areas of increased floral diversity will result in permanent removal of indigenous species.

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Fauna	The site is considered relatively sensitive in general and there are several features of high significance for fauna along Alternative 1 which should preclude this as viable alternative. There is an extensive area of wetlands associated with the Sandspruit River that is likely to be of significance for all faunal groups as well as being sensitive as a habitat in its' own right. In terms of the other three alternatives, there is not a lot of difference between the routes, but the greater extent of wetlands along Alternative 2A and Alternative 2B compared to Alternative 2C means that the latter is identified as the preferred route alternative. The substation site is located within a previously disturbed site and as a result is not considered sensitive. As a result, the majority of the impact associated with the development will result from the power line.
Surface Water	There are a total of twenty-three (23) watercourses that can be found along Alternative 6. These consist of eight (8) hillslope seeps, eight (8) channelled valley-bottom wetlands, two (2) rivers with associated riparian corridors, and five (5) unchannelled valley-bottom wetlands. Of these, a total of eleven (11) watercourses will be required to be spanned. One (1) channelled valley-bottom is too wide to be spanned, and thus a tower is most likely required to be constructed within the wetland. Due to the high number of potential watercourses to be impacted, Alternative 6 is not preferred.
Agricultural Potential and Soils	Route crosses low value agricultural land (natural veld, unimproved grazing and scrub plantation). Route crosses low value agricultural land (natural veld, unimproved grazing and small subsistence fields) with pockets of moderate value agricultural land which can be avoided. The findings of this assessment indicate that proposed Power Line Alternatives 1, 2A and 2B share virtually similar agricultural potential and value and are all suitable to accommodate the proposed development. Alternative 2C contains a band of moderate agricultural land which should be avoided by utilising an alternative corridor. <u>Although longer Alternative 1 is the preferred option as it influences the land with the lowest agricultural value.</u>
Heritage	A cultural heritage survey of the proposed Coal-Link Project at Sheepmoor, Mpumalanga Province identified three heritage features on the identified footprint. These include two Cemeteries and one Later Iron Age Site. It is suggested that the developer shift the trajectory for the proposed substation and associated power lines at least 30m in the opposite direction from the relevant heritage sites in order to allow for a buffer zone of at least 40m. Mitigation would be impractical and it is not supported by this study. There is no archaeological reason why the proposed development may not proceed on the remainder of the footprint as planned.
Avifauna	On the Southern Circuit the 2A route is preferred as it more or less follows the road once it is south of the R29. The other two options are not preferred as they pass through less developed areas. It is strongly recommended that 2B and 2C are not developed. Overall the southern circuit or Alternative 2 is more preferred as it does not traverse the high ground mentioned above. In general it would be preferred that the two lines are placed adjacent to each other rather than in separate corridors. This is because grouping the impacts in one corridor would be preferred, and multiple lines are believed to be more visible to birds thereby reducing the collision risk. Overall then the order of preference of the above seven options is as follows: Option 2 > Option 1 > Option 5. Options 3, 4, 6 and 7 should not be considered further.
Visual	Splitting the power lines between the two route alternatives would magnify the visual impact and expose more potentially sensitive farmsteads and other residents

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	to visual impacts of the proposed power lines.
Socio-Economic	N/A

Option 7: Combination of Power Line Alternative 1 and Power Line Alternative 2C (Not preferred Alternative)

Botanical	The same descriptions as given above apply here for both respective corridors, but in terms of localising and minimising negative impacts, it would be better for two power-lines to be erected in EITHER Corridor 1 OR 2C.
Floral Habitat	It is recommended that the Sheepmoor Substation Alternative and Line Alternative 2A be considered as the preferred alternatives in order to prevent highly significant impacts on the receiving floral environment. Placement of infrastructure, especially Line Alternatives 1 and 2B, within areas of increased floral diversity will result in permanent removal of indigenous species.
Fauna	The site is considered relatively sensitive in general and there are several features of high significance for fauna along Alternative 1 which should preclude this as viable alternative. There is an extensive area of wetlands associated with the Sandspruit River that is likely to be of significance for all faunal groups as well as being sensitive as a habitat in its' own right. In terms of the other three alternatives, there is not a lot of difference between the routes, but the greater extent of wetlands along Alternative 2A and Alternative 2B compared to Alternative 2C means that the latter is identified as the preferred route alternative. The substation site is located within a previously disturbed site and as a result is not considered sensitive. As a result, the majority of the impact associated with the development will result from the power line.
Surface Water	There are a total of twenty-five (25) watercourses that can be found along Alternative 7. These consist of nine (9) hillslope seeps, eleven (11) channelled valley-bottom wetlands, four (4) rivers and associated riparian corridors, and one (1) unchannelled valley-bottom wetland. This option contains the highest number of wetlands that could potentially be affected by the proposed development. Of these, a total of ten (10) watercourses will be required to be spanned. One (1) channelled valley-bottom is too wide to be spanned, and thus a tower is most likely required to be constructed within the wetland. Due to the high number of potential watercourses to be impacted, Alternative 7 is not preferred.
Agricultural Potential and Soils	Route crosses band of cultivated land of moderate value that cannot be skirted or spanned. The findings of this assessment indicate that proposed Power Line Alternatives 1, 2A and 2B share virtually similar agricultural potential and value and are all suitable to accommodate the proposed development. Alternative 2C contains a band of moderate agricultural land which should be avoided by utilising an alternative corridor. <u>Although longer Alternative 1 is the preferred option as it influences the land with the lowest agricultural value.</u>
Heritage	A cultural heritage survey of the proposed Coal-Link Project at Sheepmoor, Mpumalanga Province identified three heritage features on the identified footprint. These include two Cemeteries and one Later Iron Age Site. It is suggested that the developer shift the trajectory for the proposed substation and associated power lines at least 30m in the opposite direction from the relevant heritage sites in order to allow for a buffer zone of at least 40m. Mitigation would be impractical and it is not supported by this study. There is no archaeological reason why the proposed development may not proceed on the remainder of the footprint as planned.

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Avifauna	<p>On the Southern Circuit the 2A route is preferred as it more or less follows the road once it is south of the R29. The other two options are not preferred as they pass through less developed areas. It is strongly recommended that 2B and 2C are not developed. Overall the southern circuit or Alternative 2 is more preferred as it does not traverse the high ground mentioned above.</p> <p>In general it would be preferred that the two lines are placed adjacent to each other rather than in separate corridors. This is because grouping the impacts in one corridor would be preferred, and multiple lines are believed to be more visible to birds thereby reducing the collision risk.</p> <p>Overall then the order of preference of the above seven options is as follows: Option 2 > Option 1 > Option 5. Options 3, 4, 6 and 7 should not be considered further.</p>
Visual	Splitting the power lines between the two route alternatives would magnify the visual impact and expose more potentially sensitive farmsteads and other residents to visual impacts of the proposed power lines.
Socio-Economic	N/A

No-go alternative (compulsory)

Socio-Economic	- Negative socio-economic impacts as a result of inadequate supply of electricity to the Transnet railway system thereby preventing an increased export tonnage of coal. This will prevent job creation in the area and hinder South Africa's economic growth in the coal export sector.
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SECTION E. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)?



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

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

Recommendations of the Biodiversity Specialist

- Avoid any impacts to streams and wetlands and determine an ecologically sound buffer to protect these.
- Remove all waste materials from construction and installation sites.
- There are very few existing tracks in this corridor for installing and servicing the power-line. New tracks will have to be made through both threatened vegetation types.
- A focused vegetation survey along specific new tracks and at construction and installation sites will be necessary to check for threatened plant species and plant species of conservation concern.
- Confine all activities to specific construction and installation sites.
- Remove all waste materials from construction and installation sites.
- Adhere to recommended alignments
- Confine all activities to specific construction and installation sites.
- Remove all waste materials from construction and installation sites.

Recommendations of the Floral Specialist

Development footprint

- The boundaries of the development footprint areas are to be clearly defined and it should be ensured that all activities remain within defined footprint areas.
- Edge effects of all construction and operational activities, such as erosion and alien plant species proliferation, which may affect floral habitat, need to be strictly managed.
- No dumping of waste material should be allowed within the study area at any stage of the development, and all building materials should be removed when construction is completed. Designated areas should be set out for waste material and regularly removed to an appropriate authorised dumping facility.

Flora

- Proliferation of alien and invasive species is expected within any disturbed areas. These species should be eradicated and controlled to prevent their spread beyond the development footprint areas. Alien plant seed dispersal within the top layers of the soil within footprint areas, has to be controlled.
- Species specific and area specific eradication recommendations:
 - Care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used.
 - Footprint areas should be kept as small as possible when removing alien plant species.
- Two (2) of the RDL species for the QDS have a moderate probability to occur within the study area, namely *Asclepias bicuspis* and *Aloe kniphfioides*. Furthermore, several other species protected under the Mpumalanga Nature Conservation Act (MNCA) (Act 10 of 1998), such as

species in the families Orchidiaceae, Iridaceae and Liliaceae, are highly likely to occur within the study area, especially in the wetland and pristine grassland areas, and if any of these are to be disturbed, permits must be obtained from the Mpumalanga Tourism and Parks Agency (MTPA). Thus, it is recommended that the Sheepmoor Substation Alternative and Line Alternative 2A be considered as the preferred alternatives from a SCC and RDL floral perspective.

- Thus, it is recommended that a site-specific walkdown of the preferred substation and power line alternative is performed prior to construction in order to rescue and relocate any such species.
- Should any other floral SCC or RDL species be encountered within study area, the following should be ensured:
 - If any threatened species, or nationally or provincially protected floral will be disturbed, ensure effective relocation of individuals to suitable similar habitat. Arrangement with the relevant authorities needs to take place to rescue and relocate the species.
 - All rescue and relocation plans should be overseen by a suitably qualified specialist.

Recommendations of the Surface Water Specialist:

- Firstly, no proposed development must take place within the delineated surface water resources as far as possible. Where it is unavoidable and it is absolutely necessary for sound technical reasons, the routing of the proposed power line should take place within the narrowest point of the wetland, as to minimize any potential impact to the surface water resource. Ideally, the proposed power line route should be routed around and/or away from the delineated surface water resources. Importantly, monopole towers must not be placed in any of the delineated surface water resources unless absolutely necessary and where the necessary licenses and authorisations have been obtained.
- With respect to the comparison of proposed alternatives, it is recommended that the power line should follow the proposed Alternative 2 route. This is mainly because there will be fewer direct and indirect impacts on surrounding watercourses, with respect to the spanning of the power line and tower locations. Additionally, where possible, the line should follow the existing secondary dirt road, as to further minimise potential impacts on the surrounding environment.
- Since it will be required that at the very least one (if the recommended corridor alternative and substation location are selected) or more wetlands (should any of the other proposed alternatives be selected) will need to be crossed, consultation with the Department of Water and Sanitation will be required to determine the need for any authorisations (for example, a General Authorisation) or licenses (for example, a Water Use License) will be required once the final tower positions have been determined. Given the above, it will be likely that a follow-up wetland specialist assessment will need to be undertaken that meets with the requirement of the required authorisation or license. As a worst case scenario, should a water use license be required, the scope of works that must be included in the assessment will need to encompass a Present, Ecological Status assessment, an Ecological Importance and Sensitivity Category assessment as well as an Ecosystem Services assessment. This is recommended to take place as part of a final wetland walk-down assessment prior to the finalisation of the proposed power line and location of the substation to inform the final placement of the proposed development.
- Following the comparative analysis, recommendations to the final routing were proposed. In the context of the proposed development, the potential environmental and water legislative implications were explored. It was identified that a water use licence in terms of water uses 21(c) and 21(i) under the NWA is highly likely to be required where watercourses are to be

spanned or will require monopoles to be placed within them. Moreover, it was identified that environmental authorisation is also likely to be required with regards to Activity 11 and 18 as stipulated in Government Notice R. 544 Listing Notice 1 of the EIA Regulations (2010). However, the determining authorities (DEA and DWA) should be contacted to provide final confirmation and establish whether the stipulated water uses and environmental activities will be applicable to the proposed development.

Recommendations of the Agricultural Potential and Soils Specialist

- Storage of any materials shall not take place within 32m of any watercourses or sensitive environments.
- Fuel, oil and any other hazardous substances and harmful materials shall be stored in suitable containers within adequately bunded areas (with 110% of the capacity of the volume of the container) in a dry, secure environment, with concrete or sealed flooring.
- Material Safety Data Sheets shall be kept for all hazardous materials and substances and a copy of the Material Safety Data sheets shall be made available to all workers to ensure that the required safe handling and necessary precautions are taken when using the materials.
- The PC will ensure that materials storage facilities are cleaned/ maintained on a regular basis, and that leaking containers are disposed of in a manner that allows no spillage onto the bare soil or surface water.
- Interact with impacted landowners to discuss where they would ideally like to see the power lines situated on their property to have the least impact on their farming practices, the negotiation phase should form part of the final survey / line route selection.
- Employ a low impact routing to avoid / skirt high value agricultural land. This is particularly important for the various agricultural areas identified.
- The utilisation of optimal tower designs can further reduce the potential impacts.
- Attempt to place towers on the edge of existing agricultural areas and span active agricultural fields as far as possible. Following existing roads and utilising the edge of road servitudes is highly recommended due to the existing impacts associated with these areas.
- Ensure adequate compensation is paid to land owners where necessary.
- Employ erosion control:
 - Clearing activities should be kept to a minimum.
 - In the unlikely event that heavy rains are expected, activities should be put on hold to reduce the risk of erosion.
 - If additional earthworks are required, any steep or large embankments that are expected to be exposed during the 'rainy' months should be armoured with fascine like structures.
 - If earth works are required then storm water control and wind screening should be undertaken to prevent soil erosion.
- Avoid active cultivated land by building in the centre of the assessment area, which is characterised by low value agricultural land (grazing land).
- Due to the overarching site characteristics and the nature of the proposed development viable mitigation measures are limited and will most likely revolve around erosion control.

Recommendations of the Avifauna Specialist

- The avifaunal walk through should identify any breeding sensitive species along the servitudes and develop case specific management measures to reduce the effects of disturbance at such nests.
- General environmental best practices should suffice for reducing the general disturbance as far as possible. These include; strict management of staff, vehicles and machinery on site; and completing construction within the shortest possible time.
- All of the natural vegetation along the servitude and on the substation site should be protected as far as possible, although it is acknowledged that some removal is inevitable. It is recommended that vegetation removal is kept to an absolute minimum however.

- It is essential that the monopole structure be used with an Eskom Bird Perch to provide safe perching space for large birds well above the dangerous hardware. There is a likelihood of large raptors perching on the pylons occasionally.
- An avifaunal walk through study will be required prior to construction once tower positions are final in order to identify the exact spans of line posing a collision risk.

Recommendations of the Heritage Specialist

- Maintain a buffer of 30m around Cemetery 1 adjacent to Sheepmoor Village where possible, and make sure that the cemetery is properly fenced especially on the side closest to the substation.
- Shift the proposed substation and power line trajectory at least 20m to the west of its present trajectory
- Erect a sturdy fence with an entrance gate on the western border of Cemetery 1.
- Maintain a buffer of at least 30m around Cemetery 2 that situated in the southern section of the footprint.
- Shift the proposed power line trajectory at least 20m east of its present trajectory.
- Maintain a buffer zone of at least 30m around the identified Later Iron Age Site.
- Shift the associated power line at least 50m to the south of its present trajectory.

Recommendations of the Visual Specialist

- Locate construction camp and storage areas in zones of low visibility i.e. behind tall trees or in lower lying areas.
- Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.
- Maintain a neat construction site by removing rubble and waste materials regularly.
- Make use of existing gravel access roads where possible.
- Locate construction camp and storage areas in zones of low visibility i.e. behind tall trees or in lower lying areas.
- Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.
- Maintain a neat construction site by removing rubble and waste materials regularly.
- Make use of existing gravel access roads where possible
- Locate the substation as far away from sensitive receptor locations as possible.
- Where possible, locate the substation behind tall trees so that it is less visible from local homesteads.
- Align the power lines as far away from potentially sensitive receptor locations as possible.
- In order to consolidate the visual impact, align the two power lines so that they run parallel to each other within the same route corridor alternative.
- Where possible, align the power lines to run parallel to linear impacts such as the existing railway line.
- Where possible, avoid crossing areas of higher elevation, especially ridges, koppies or hills.
- Align the power lines within or behind the tall commercial forestry plantation, where possible.

Recommendations of the Geotechnical Specialist

- It is recommended that the construction of the earthworks be carried out in accordance with the requirements given in the ESKOM Distribution Standard: Standard for Roadworks for Substations and Access Roads, dated September 1999.
- The following procedure for the construction of general fill or subgrade is given as follows:
- All vegetation should be cleared from the areas over which fills are to be built.
- In addition the upper 100mm of topsoil should be removed and stockpiled for later use as topsoil.
- The upper 300mm of the in situ subgrade should be ripped, wet and recompacted to minimum 90% MDD.
- Fill materials will be constructed from cuts made on site where possible. The material used for fill should meet G10 quality requirements, i.e. minimum CBR =3 at 90% MDD compaction.

- Fills should be placed in layers not exceeding 200mm loose thickness, and compacted to a minimum of 90% Modified AASHTO maximum dry density. Boulders larger than 60mm in maximum dimension should not be included in the fill material.
- Where the natural ground surface exceeds 1 vertical to 6 horizontal, it is recommended that the fill is benched into the in situ soils. The benches should be approximately 2.5 metres wide and at least 1.0 meters deep. The need for the subsoil drainage both beneath and in the fill will have to be assessed during the earthworks, taking into account the height and locality of the fill.
- The in situ materials encountered beneath this site are generally fair to good subgrade materials meeting ESKOM subgrade requirements, however, some areas may be very clayey in composition such as inspection pit SHE4 (below 1.0m depth) and as such are generally very poor subgrade materials with anticipated quality G10 or < G10. These soils are moisture sensitive and are difficult to compact. These materials are not suitable for use in bulk fills. Where these materials are removed or boxed out from the cut portion of the platform, they should be stockpiled or removed from site, and replaced with appropriate quality subgrade taken from elsewhere on site.
- Both during and after construction, the site should be well graded to permit water to prevent ponding of water anywhere on the ground surface. The platform should be sloped to a gradient of not less than 1 vertical in 50 horizontal to prevent ponding and ingress of water into the subsoils.
- Surface drainage should be directed away from the crests of the fill embankment to prevent over-topping and erosion of the fill slopes.
- Cut and fill slopes should be topsoiled and planted with grass. This will limit erosion of these slopes and the problems associated with wash-aways of fill embankments.

General Recommendations of the EAP

- All feasible mitigation measures recommended by the various specialists should be strictly implemented, where applicable to the authorised power line alignment.
- A Final Site-Specific EMPr should be approved by DEA prior to construction, which will need to include detailed specialist reports and mitigation measures for the authorised powerline corridor, including the positioning of the structures and the substation.
- It is recommended that a five (5) year validity period be granted for the Environmental Authorisation

Is an EMPr attached?

✓YES

The EMPr must be attached as Appendix G.

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

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

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

Jenny Barnard - **SIVEST (Pty) Ltd**

NAME OF EAP


SIGNATURE OF EAP

11 June 2015

DATE

SECTION F: APPENDIXES

The following appendixes must be attached:

Appendix A: Maps

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Specialist reports

- Appendix D1: Biodiversity Impact Assessment
- Appendix D2: Desktop faunal Review
- Appendix D3: Surface Water Impact Assessment
- Appendix D4: Agricultural Potential and Soils Assessment
- Appendix D5: Avifauna
- Appendix D6: Heritage Impact Assessment
- Appendix D7: Visual Impact Assessment
- Appendix D8: Geotechnical Impact Assessment

Appendix E: Public Participation

- Appendix E1: Proof of Advertisements and Site Notices
- Appendix E2: Proof of Written Notification to Stakeholder
- Appendix E3: Comments and Response Report **(To be included in the FBAR)**
- Appendix E4: Proof of Written Notification to Authorities and Organs of State
- Appendix E5: I&APs Database
- Appendix E6: Correspondence and Meeting Minutes **(To be included in the FBAR)**

Appendix F: Impact Assessment

Appendix G: Environmental Management Programme (EMPr)

Appendix H: Details of EAP and expertise

Appendix I: Specialist's declaration of interest

Appendix J: Additional Information

- Appendix J1: Competent Authority Consultation
- Appendix J2: Coordinate Spreadsheets
- Appendix J3: Eskom Guideline Documents

List of abbreviations

BA	Basic Assessment
BAR	Basic Assessment Report
BSA	Basic Social Assessment
C&RR	Comments and Response Report
CBA	Critical Biodiversity Area
ESA	Ecological Support Area
DAFF	Department of Agriculture, Forestry and Fisheries
DBAR	Draft Basic Assessment Report
DS	Distribution Station
DWA	Department of Water Affairs
EMF	Electric and Magnetic Fields
EMPr	Environmental Management Programme
FBAR	Final Basic Assessment Report
GIS	Geographic Information System
GN	Government Notice
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
kV	Kilovolt
MTS	Main Transmission Substation
NCDTEC	Northern Cape Department of Environmental Affairs and Nature Conservation
NEMA	National Environmental Management Act, 1998 (Act No.107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NFA	National Forests Act, 1998 (Act No. 84 of 1998)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NNR	No Natural Area Remaining
NPAES	National Protected Area Expansion Strategy
NWA	National Water Act, 1998 (Act No. 36 of 1998)
ONA	Other Natural Area
PPP	Public Participation Process
PV	Photovoltaic
REIPPP	Renewable Energy Independent Power Producer Programme
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute

BASIC ASSESSMENT REPORT

SANRAL South African National Roads Agency SOC Limited
SDF Spatial Development Framework
SG Surveyor General
SOC State Owned Company